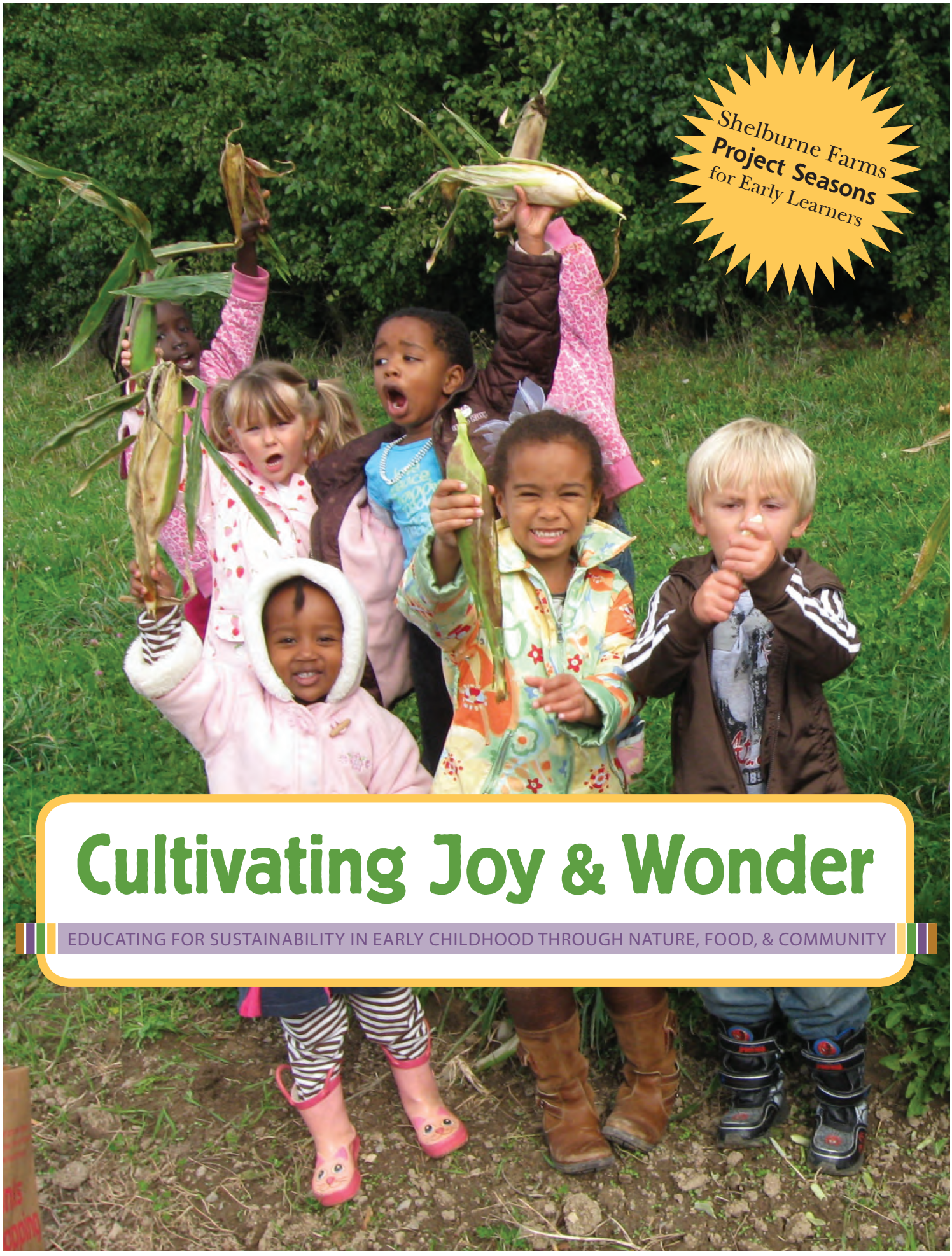

Cultivating Joy & Wonder

EDUCATING FOR SUSTAINABILITY IN EARLY CHILDHOOD THROUGH NATURE, FOOD, & COMMUNITY

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EDUCATING FOR SUSTAINABILITY IN EARLY CHILDHOOD
THROUGH NATURE, FOOD, & COMMUNITY

written by Emily Hoyler & Linda Wellings
edited and designed by Holly Brough

Shelburne Farms **Project Seasons** for Early Learners

Made possible with support from
The A.D. Henderson Foundation

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Shelburne Farms is a nonprofit education center, 1,400-acre working farm, and National Historic Landmark located in Vermont's Champlain Valley. The Farm's mission is to cultivate a conservation ethic for a sustainable future by practicing the stewardship of natural, agricultural, and cultural resources and educating young people to become ecologically literate and caring citizens who make choices that create a healthy and just world.

"If I had influence with the good fairy who is supposed to preside over the christening of all children I should ask that her gift to each child in the world be a sense of wonder so indestructible that it would last throughout life, as an unfailing antidote against the boredom and disenchantments of later years, the sterile preoccupation with things artificial, the alienation from the sources of our strength."

— *Rachel Carson, "The Sense of Wonder""*

This book is dedicated to:

Virgina (Puddy) Davis *(1917-1997)*, **who planted the seed for our early childhood programs by launching a weekly story-time hour with two community volunteers. Little did we know how that seed would take root and grow.**

Linda Wellings, our extraordinary "facilitator of wonder," who has been the heart and soul of the early childhood programs at the Farm. Her infectious joy for life, talent for educating, and powerful love for all children is a lasting gift and inspiration for all who spend time with "Ms. Linda."

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Cultivating Joy and Wonder is the culmination of Shelburne Farms' experiences in early childhood learning on the Farm and in our community. This resource represents two decades of working with thousands of young learners who have taught us so much about the lifelong impact of learning firsthand through the natural world, agriculture and the community. We are deeply indebted to all who have shared their gifts of teaching and their love of children and the land. We are honored to share their work with other educators.

In particular, we thank our Shelburne Farms education staff (1992-2013), who have all played a role in developing our early childhood programs: Anne Bijur, Ethan Bodin, Lissa Bogner, Peter Bullock, Margaret Burke, Jen Cairns, Rachael Cadwallader-Staub, Donald Campbell, Anne Campbell, Amy Chambers, Jen Cirillo, Bethany Corson, Erica Curry, Keely Deutsch, Matt Dubel, Judy Elson, Josh Hahn, Joan Haley, Angela McGregor Hedstrom, Dana Hudson, Sarah Kadden, Suzy Kneeland, Sally Lincoln, Johanna Liskowsky-Doak, Christine Lutters, Susie Marchand, Tre McCarney, Christie Nold, Kim Norris, Deb Parrella, Danielle Pipher, Amy Powers, Lori Sanders, Sonya Sapir, Sam Smith, Pat Straughan, Tiffany Tillman, Laura Viani, Caroline Warner, Reina Warren, Cat Wright, and Erica Zimmerman. These educators, in turn, could not have done their work without the support of many Work and Learn interns and apprentices, who carry the work forward and outward into the world.

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Final thanks to our partners at the Burlington School District and the King Street Youth Center who have provided both the inspiration and the synergistic learning opportunity for developing so many of the insights, activities, and stories shared in this resource.

Sustainability Academy at Lawrence Barnes, a Pre-K through grade 5 public school for 230 students which is located in Burlington, Vermont's Old North End, a vibrant community just north of downtown, home to a racially and socioeconomically diverse community that includes many of the city's Refugee Resettlement Community. In 2004, Shelburne Farms began working closely with the faculty, staff, students, and families of the school on curriculum development, campus ecology and practice, and building community partnerships. In 2009, we officially became the school's strategic partner as it transitioned from a neighborhood school to an Education for Sustainability-themed magnet school. http://sa.bsdvt.org

The King Street Center, a Burlington, Vermont-based nonprofit community organization that provides children and families the core life-building skills necessary for a healthy and productive future. Its programs develop the fortitude needed to succeed at home, in school, and in life. Their whole-person approach to youth development embraces the entire family, neighborhood, and community. For 18 years, the preschool program has visited the Farm for Friday mornings throughout the school year and and for a week in the summer. The Shelburne Farms partnership gives King Street children a chance to play and learn outdoors on green meadows, in leafy woodlands, and with silly chickens—building their connections to the natural world. www.kingstreetcenter.org

Champlain Valley Head Start (CVHS), offers center-based and home-based services to eligible children and families throughout Franklin, Grand Isle, Chittenden and Addison Counties. Its mission is to provide high quality services to help children and families thrive and reach their full potential. CVHS believes in the truth of the old adage, "It takes a village to raise a child," and it builds strong collaborative partnerships by blending staffing and resources with other community service providers. Both the King Street Center and the Burlington School District's early childhood programs benefit from integrated programming with the federally funded Head Start and Early Head Start offered by CVHS.

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All Seasons Fall Winter Spring Summer

Introduction

At Shelburne Farms, we believe that early childhood education is the ideal place to begin creating a culture of sustainability. Young children are naturally curious and creative thinkers. They have a sense of wonder and awe about the world around them and are eager to explore. Early childhood education represents the beginning of formal education and provides an opportunity for children to develop a solid foundation of skills and attitudes upon which all subsequent learning will build. As educators, we can guide children's explorations through experiences set in nature, food, and community to foster a connection and conservation ethic between young children and the world.

Cultivating Joy and Wonder: Project Seasons for Young Learners was developed to document and share the pedagogy, practices, and activities of Shelburne Farm's early childhood programs, and to further promote and define Education for Sustainability (EFS) in early childhood education. From working with the state of Vermont to write the first Sustainability and Understanding Place learning standards in 2000, to being a lead partner in the nation's first sustainability-themed magnet elementary school in Burlington, Vermont, Shelburne Farms has advanced and shifted the educational paradigm to include sustainability. Because of this work, Shelburne Farms has been recognized as a global leader in Education for Sustainability.

This guide begins by describing the foundation and framework of early childhood Education for Sustainability (EFS). We share our rationale for using nature, food, and community as the settings, or context, for early childhood EFS; and identify some EFS teaching and learning strategies. Stories, snapshots, and tips from educators and practitioners will give readers a sense of "what it looks like" and inspire educators to transform their own practice, program, classroom, or school. Although this guide was developed in Vermont and reflects our culture, landscape, and climate, most of the activities, recipes, and resources are easily adaptable. Use what makes your place unique to adapt this guide to suit your needs.

The Threads are themes of exploration that are built around big ideas and essential questions. These Threads guide seasonal adventures and explorations. Throughout each of the four Threads, activities are interwoven to include both self-guided learning opportunities and Facilitated Learning Experiences that flow throughout the seasons.

We believe that the deepest learning comes from asking good questions and allowing the learner to discover the "answer" to those questions in meaningful and relevant ways.

Each Thread provides a template for organizing your curriculum, learning experiences, and classroom. They are designed to encourage the discovery of the natural world, food systems, and community in an integrated and emergent way, through the use of essential questions and big ideas. We believe that the deepest learning comes from asking good questions and allowing the learner to discover the "answer" to those questions in meaningful and relevant ways.

For classroom-based educators, each thread could become the basis of your curriculum for an entire year, or the Threads could also serve as resources to explore children's emerging interests—in any order. Whether you are seeking to immerse students in an ongoing exploration, or are simply looking to identify an activity to use with students on a particular topic, this section will provide you with the clarity and focus to guide children's learning. Likewise, farm-based educators can use this guide to design educational opportunities that relate to classroom curriculum through the use of big ideas, or gather ideas for setting up an outdoor classroom for school groups and families visiting their farm. Families may find inspiration throughout the Threads, either for setting children up for unstructured play at home, or for more planned experiences with their children.

Early Childhood Learning Standards and Developmentally Appropriate Practice

We believe education is at its best when it is emergent and driven by children's interests and place. We've designed multiple opportunities within each Thread and Facilitated Learning Experience to meet state and national learning standards while leaving room for emergence and student interest. Early childhood learning standards primarily address the skills, knowledge, and attitudes young children need to develop for success in forthcoming years. This guide has been created with consideration of the NAEYC curriculum standards, NAEYC Developmentally Appropriate Practice (DAP) guidelines, Teaching Strategies GOLD Objectives for Development and Learning, and the Head Start program. We urge educators who are not already familiar with these standards and guidelines to become familiar with them. Most are available online.

Education for Sustainability in Early Childhood Education

When we say sustainability, we're simply using a term that for many cultures represents an age-old tradition: Improving the quality of life for all—economically, socially, environmentally—now and for future generations. Education for Sustainability (EFS) works to nurture the development of citizens engaged in creating sustainable communities.

An Education for Sustainability framework based on the work of Shelburne Farms' Sustainable Schools Project (see Figure 1), describes EFS as, "*education that cultivates in students an understanding that the world is interconnected, that builds knowledge of the students' human and natural communities, and provides students with opportunities to make a difference through service-learning.*" With each lesson learned, students develop their own understanding of the connections in their communities. Students' personal appreciation and experience of interdependence build a foundation of understanding that will grow as they do, supporting global decision-making in their future.

Figure 1. Education for Sustainability Framework
(Sustainable Schools Project)

Education for Sustainability connects the larger goal of improving the quality of life for all with the learning experiences we provide for our children. While the term *Education for Sustainability* may be new to many educators, the concepts that

Education for Sustainability

is learning that links knowledge, inquiry, and action to help students build a healthy future for their communities and the planet. It helps teachers bridge grade levels and subject areas, curriculum and school operations, and parent and community partnerships.

— Shelburne Farms' Sustainable Schools Project

Learn more about Education for Sustainability at the Sustainable Schools Project's website:
www.sustainableschoolsproject.org

sustainable schools project

"One of the most significant responsibilities that [early childhood] professionals have is to support children to retain the sense of awe and wonder that they are born with, to add to that desire to nurture and protect what is beautiful, and to encourage them to appreciate that there are many possibilities for honoring life and wonders that the world holds."

— Stonehouse, 2006
from the New South Wales, Australia Curriculum Framework 73

underlie EFS are not. Elements of EFS have been a part of the fabric of education philosophy and pedagogical approaches for hundreds of years.

We like to think of EFS as an integrating lens or theme. Imagine a hand lens you use to look at the world that illuminates the connections between the economy, the environment and social equity. Essentially, EFS reintegrates our view of the world, so we see the parts as well as the whole, and allows us to consider multiple perspectives. When applied to education, this *lens of sustainability* allows us to see the interconnections between curriculum, campus practices and ecology, community and family partnerships—education as a whole.

The term *sustainability* is an abstract concept for young children to grasp. One approach to helping children understand sustainability is to instead focus on smaller chunks, or what we call the *Big Ideas of Sustainability*. These concepts make the complexity of sustainability accessible to even the youngest learners. Shelburne Farms and our partners in EFS have identified some Big Ideas that help frame curriculum, projects, and build toward student understanding. For the purpose of this guide we have used:

- Change over time
- Community
- Cycles
- Diversity
- Fairness/Equity
- Interdependence

In early childhood education, an emphasis on care—for oneself, one's community, and the land—takes precedence. Sustainability is about respect, responsibility, and reflection and can be a wonderful integrative theme to make sense of the world.

The threads in this book are organized by the Big Ideas of Sustainability. Each thread focuses on one or two Big Ideas and provides ample opportunities for children to deepen their understanding over time. Some of the Big Ideas, like fairness, may not be explicitly taught, rather, they emerge as children discuss and discover what makes their classroom community fair and just. Other Big Ideas, like Change Over Time, may be the focus of classroom curriculum and revisited as the seasons change and new learning emerges. It's important to note that young learners are not expected to master these ideas. The goal is to allow children to become familiar with these ideas and help them to construct a foundation upon which they will continue to build meaning and deepen their understanding as they grow and learn.

WHAT'S THE Big Idea?

The Big Ideas of Sustainability

Change Over Time: All organisms, places, and systems are constantly changing.

Community: A group of living and non-living things sharing a common purpose or space.

Cycles: Every organism and every system goes through different stages.

Diversity: All systems and places function because of variety.

Fairness / Equity: Organisms must share resources to meet the needs of living things equally, across places and generations.

Interdependence: All living things are connected. Every organism, system, and place depends on others.

Ultimately, Education for Sustainability is about hope. We educate for sustainability because we believe we can improve quality of life, now and in the future. For this to happen, it is vital that children and adults see themselves as deeply connected to the world around them, and believe in their own capacity to create change. In early childhood education, the goal of EFS is to nurture young children's connection to the world around them. It is about cultivating the skills, knowledge, and understanding in young children that allow them to contribute to building sustainable communities.

VOICE *from the* FIELD

One Step at a Time:
Our Education for Sustainability Journey

Sustainability Academy Kindergarten teachers Julie Benz and Sue Blair share the story of their professional journey of becoming teachers of EFS.

Julie Benz and Sue Blair

It's hard to believe it's been ten years since our school began its transition toward education for sustainability. In that time, we've moved from being a neighborhood school, Lawrence Barnes Elementary, to being a district-wide magnet school, the Sustainability Academy at Lawrence Barnes. There have been so many changes. At times, it feels like we have so far to go, but when we stop and look back, we really have come a long way.

When we first started talking about sustainability we remember not getting it. Our school had partnered with Shelburne Farms, and we had professional support, fantastic Farm educators in our classrooms working with us, and we were trying to understand, but we still didn't get it. It was like our teaching was *here*, and sustainability was *there*, almost like a separate subject to teach. But then we realized that it's not something separate—sustainability is a lens for looking at everything we are already doing. Looked at this way, we realize that it's often just a little tweak that moves our work toward EFS. We recycled paper before, but now we talk about why. We now see how areas of our curriculum line up with EFS, and how we can make it happen. It's a process, it doesn't happen overnight. We take small steps.

As a public school, we have a lot of curriculum requirements for what we have to do and when. It can feel like a big weight on our shoulders. But by thinking about the "tight" and the "loose"—the things we can't change and the areas where we have some flexibility, we've been able to do things differently. We always have the curriculum in the back of our mind, we know what we have to cover, but we ask ourselves: can we use an inquiry-based approach? Can we do this outside? How does this connect to the Big Ideas of Sustainability? How can our students have a voice in what we do?

When Sue switched to kindergarten three years ago, it launched our team, and having a partner that you have a good working relationship with has been key to our success in EFS. We learn from each other, we push each other. Neither of us feels like we're on our own. It's not scary going on a field trip with another solid adult you can depend on to care for your students. You know one class may be a little more challenging than the other but you can split them up, we can do this together.

Our essential question for the year is "What is a community?" and we feel it's really important that our students know what our classroom community is—that it's not two separate classrooms, but one community. At first, we ran our two classes separately, but now we're doing something new. This year,

from the beginning, we merged our children back and forth together. In thinking about our curriculum focus on community, there's the concrete focus, like when we do our community helpers unit, but there's also a representation of our big idea in the way we manage our groups. Not only are children learning what a community is, they're experiencing that we're a community, we work together, and all the adults in the community care about us. We are a kindergarten community and we started being one on day one.

We also began our outdoor classroom adventure. We had been inspired by a workshop we had attended at the spring 2011 Vermont Kindergarten Conference where we learned about another kindergarten class who spent their Fridays outside. After that initial workshop we started thinking about how we could get outside and connect our children with nature, and use our natural playground. Immediately our minds went to the roadblocks. Scheduling was a huge barrier: we needed a block of time where both classes could be free from specials and services to work together, and we needed some common planning time. So we went to our principal, and he made that magic happen. We established our gathering spot, and met there every Friday morning. This year, our second year, we brought our children outside from the beginning. We don't go out every day, but we're not limited to Fridays.

We've made a lot of progress in our curriculum as well. We try to integrate subjects whenever possible, for example, by including a literacy connection into our morning meeting that connects to our major unit, like our butterfly life-cycle unit at the beginning of the year. We use our school garden for sit spots. We try to close our outdoor classroom program every week with a sit spot activity where the children find a spot to sit in and take time to use their "owl eyes," then write a reflection in their Science Nature Guide on cardboard clipboards. We find ourselves easing up a little bit on some of the curriculum—we've realized that our children need to have some free exploration time. We're giving ourselves permission to do that now. And yes, we're not anywhere as close to where we were in our curriculum last year at this time, but our children are engaged and they are learning.

So we've slowed down. This year, from the very beginning of school, we've spent less time on content and more time on our community. And you can't grade this. When our children come inside on Fridays, after having spent all morning outside playing and exploring, we have great afternoons. They're happy; their energy levels come down; their behavior is better: they're ready to learn.

Our next goal is to find a block of time every day for this to happen. One more step on this journey, one small change at a time.

Nature, Food, and Community: The Why, What, and How of EFS in Early Childhood

> **"Learning is way more than words on a page. It's water moving around our boots. It's mud and cold. It's all these sensory dimensions in the real world we're part of. If it's rivers kids are learning about, then standing in one and turning over stones to find stoneflies teaches in new ways that connects them. They gain new respect for the river. They have opportunities to see themselves as a part of something that has a long history and a long future. They become more hopeful. Through the experience they learn to become stewards."**
>
> *— Michael Quinn, White River Junction, Vermont, from the Promise of Place Report Card*

We are all connected: to nature, to food, to our communities. Understanding and nurturing these connections begins in early childhood and is cultivated through joyful encounters that inspire wonder and curiosity. In order to care for the world—from our backyards to the other side of the globe—we must first get to know and fall in love with it. Establishing a deep connection to our place through joy and wonder provides the foundation for developing an attitude of stewardship and responsibility. *(Wells & Lekies, 2006)*. We have chosen to root our early childhood EFS learning experiences in the contexts of nature, community, food, and fiber, as these provide relevant and engaging contexts in which children can explore the Big Ideas of Sustainability and foster essential connections to their place.

Nature

Richard Louv's work on Nature Deficit Disorder has brought widespread attention to each ensuing generation's weakening connection to the natural world. Humans, as part of the natural world, are inherently connected to all that is wild. Yet children are growing up with fewer neighborhood places in which to play and explore. There is more parental fear of outdoor hazards and crime. The call of electronic media is constant and pervasive. Yet, there are proven benefits of time spent outdoors, including an increased ability to focus, increased emotional wellbeing, improved motor skills, increased creativity, reduced symptoms of ADD and ADHD, and an increase in stewardship behavior. *(Children, Youth and Environments Center for Community Engagement, 2011)*

Fact Sheets from the Children, Youth and Environments Center for Community Engagement, 2011, University of Colorado at Denver and Health Sciences Center

- *Benefits of Nature for Children*
- *Benefits of Gardening for Children*
- *Students Gain from Place-Based Education*

- **Last Child in the Woods** by Richard Louv. *Algonquin Books, Chapel Hill, NC, 2008.*
- **The Nature Principle** by Richard Louv. *Algonquin Books, Chapel Hill, NC, 2012.*

Anyone who has ever seen children catching frogs, chasing fireflies, or making mud pies doesn't need research to understand the value of outdoor play. In our forty years of teaching outdoors, we see children flourish in natural outdoor spaces. Each season, we hear from amazed teachers who report that the most engaged of these children are often the same students who struggle in a traditional classroom. Nature begs for engagement and provides a space for active learning.

Food

Everyone eats and throughout our lifetimes, each one of us develops a personal relationship with food. It is literally what sustains us. In the United States we are experiencing an unprecedented childhood obesity epidemic. Many children live in food-insecure communities where access to food, especially healthy and fresh food, is limited. In the wake of an industrialized food system, our society has lost its connection to the origins of our food. The recent surge of interest in organic food, farmer's markets, and eating locally are evidence of our yearning for connection to our food and the need for sustainable and healthy alternatives. Education is the key to creating a sustainable and healthy food system. Children who have a chance to grow, harvest, prepare, and eat healthy food are more likely to make healthy choices on their own. *(Children, Youth and Environments Center for Community Engagement, 2011).* And when children have a chance to experience the food chain from seed to plate to compost to garden, they develop an innate understanding of life cycles and interdependence. Cultivating a healthy connection to food, food systems, and fiber is essential so that young people can develop the habits that will help them grow into healthy strong adults.

Community

Our connections to the people, animals, and plants around us make us who we are. Humans are not a solitary species; we need one another to survive. In the same way that children need opportunities to get to know the natural world so that they can develop a strong relationship with it, they need that same opportunity to connect

Vermont FEED

Farm to School Food Education Every Day!
Vermont FEED

Vermont FEED (Food Education Every Day) works with schools and communities to raise awareness about healthy food, the role of Vermont farms and farmers, and good nutrition. It act as a catalyst for rebuilding healthy food systems and to cultivate links between classrooms, cafeterias, communities, and local farms. Vermont FEED is a partnership of the Northeast Organic Farming Association of Vermont, Food Works at Two Rivers Center, and Shelburne Farms.
www.vtfeed.org

with the human and human-made community that they are a part of. When children develop a strong relationship with their community at an early age, they grow up knowing and feeling a strong sense of belonging. They also often display more responsible behavior, stewardship, and civic engagement. *(Children, Youth and Environments Center for Community Engagement, 2011)* Providing young children with a chance to explore and connect with their community builds the foundation for a strong relationship to their place.

To educate for sustainability, we usually begin by helping young children develop a relationship with and connection to the world around them, through nature, food, and community. While there is no one way to do that, what follows are some emerging teaching and learning strategies that we have found very promising.

Early Childhood Education for Sustainability: Teaching & Learning Strategies

In early childhood, Education for Sustainability builds on a child's natural curiosity and sense of wonder about world around him or her. Its purpose is to cultivate a connection to the world based in understanding, joy, and wonder. It is through exploring and connecting with nature, our food, and our community where young children grow to understand, experience, and live sustainably.

Early childhood Education for Sustainability is an emerging field that combines the most promising of early childhood educational strategies with the practices and pedagogies of Education for Sustainability. Early childhood EFS focuses on a play-based, place-based, emergent, and culturally relevant curriculum. Curriculum is also integrated and interdisciplinary, allowing more relevance, meaning, challenge and purpose, and bringing a breadth and depth to education that isolated disciplines can't provide.

Early childhood EFS, like early childhood environmental education, focuses less on the knowledge and application of skills, and more on developing a young child's values and attitudes about the world around them. Environmental Education and EFS are closely related to one another and often have similar intended outcomes—a healthy and just future and an improved quality of life. Education for Sustainability has its roots in Environmental Education and draws heavily from it. The North American Association of Environmental Education published guidelines for early childhood environmental education that state "Personal perceptions, attitudes, and connections with nature are the key goals at this stage, and facilitating positive experiences varies from child to child. These guidelines emphasize the development of individual feelings, beliefs, and inner unity with nature that are so critical in the early years." *(NAAEE, 2010. p.3)* Early childhood EFS expands on these goals to include the relationships between environmental, social, and economic justice as well.

VOICE *from the* FIELD

Play Comes Naturally

Laurel Bongiorno, PhD, Program Director, Education and Human Studies Division, Champlain College

Laurel Bongiorno

When asked to think of a favorite childhood memory, many adults return to an experience of outdoor play: collecting shells at the beach, diving into piles of crisp fall leaves, sledding down snow-crusted hills, or sinking into the deep cool of a lake to escape summer's heat. As adults, many of us continue to seek a natural connection, choosing to relax and rejuvenate by walking, hiking, snowshoeing, or just sitting by the ocean. We find ourselves deeply connected to nature, a connection forged in our childhoods through unstructured play in the natural world.

Will this generation's children have those same memories? Will they feel connected to the natural world? Will they find nature a place for peace and rejuvenation? Children need time to explore the outdoors and experience their natural surroundings. Children need time to develop their gross motor capabilities by running, jumping, and climbing. They need opportunities to make their own choices. And they need opportunities to play without structure. Where better to do all of this than in the woods, in a field, by a brook, or watching a worm or a butterfly? Yet less and less play is being seen in children's lives, and early childhood educators are being asked to be more and more accountable for children's learning.

Play and learning go hand-in-hand. When children initiate the play or choose freely to engage in play offered by others, they focus their attention on the play scenario; for example, playing the role of a vendor at a farmer's market. The child cognitively must know the appropriate setting and exchanges in a farmer's market. The child must know the language of the situation and may use terms such as organic, season, and harvest. In addition, the child uses small motor skills to bag the market goods and handle the money, and uses social and emotional skills to maintain the role of the vendor and play out the scenario with other children. Children learn in multiple domains through rich play opportunities like this one.

Children's play is their context for learning, their laboratory for understanding the world around them. The more open-ended and joyful the experiences children are offered, the more their curiosity and love of learning will be sparked. Play is also about discovery. Good science instructors have always understood that just telling students about a science concept is not enough, students need to engage and inquire directly—hence science labs. Consider play the same way. If children are interested in rocks, then take them outside to explore the geology of your area. If animals are capturing their interest, take them to a local farm, to wetlands areas, or to a forest to explore. Play is open-ended and so is scientific curiosity and discovery. Observing frogs on a pond, woodpeckers in the woods, chicks hatching in a classroom, ants working together, all delight children—and allow children to explore, examine, and predict.

Both classic and modern theorists and researchers support the connection between play and learning.

Jean Piaget focused on children's experiences with their surroundings, while Lev Vygotsky focused on children's learning through social interactions with peers and adults. Vygotsky considered play a preschool child's leading activity in regard to their learning and development. Maria Montessori considered children's play their work, emphasizing how ingrained play is in their whole being. Montessori also emphasized the importance of children being outside every day.

Contemporary theorist Vivian Paley links play and language and literacy development. Bodrova and Leong write about the rich learning opportunities offered in mature pretend play. David Elkind supports play and how children learn in multiple areas such as language and literacy, physical, social and emotional, and cognitive learning and development, yet he also highlights the joyful nature of child-initiated play. Joan Almon writes about the negative effects of the lack of play including increased anxiety and stress in children. Olga Jarrett writes about the lack of recess in the school setting and its effect on children's attention and ability to self-regulate. Dorothy Singer writes about parents across the world's consistent concerns about their children playing outside safely. Richard Louv addresses what he identifies as Nature Deficit Disorder and calls for a renewed connection to the natural world fostered through wild play.

Children learn through interacting with their environment and applying their innate curiosity. Their natural actions are those of play. Play offers the opposite of didactic, direct instruction. Play is not about adults leading the way to address their own agenda. Play is about offering materials, environments, and opportunities for children to experience in their own time driven by their own curiosity. Play is joy, not drudgery.

To support children's understanding of sustainability it is important to keep play in mind. Offering opportunities for outdoor play will promote an essential connection to nature. Early childhood educators can offer opportunities for exploration of a variety of natural environments. They can offer play opportunities within the outdoor setting, and they can model relaxation and stress relief through walks outdoors or by being still and listening to the birds. They can expose children to everyday opportunities, such as tending a garden or feeding animals, or offer rich pretend play opportunities with props and vocabulary for these same activities. What is important is to keep the experience focused on opportunity, discovery, and play. As we remember our own outdoor experiences, we need to offer this generation of children the same opportunity to create their own memories of spontaneous, natural play.

We need to offer children the chance for spontaneous, natural play.

From Wonder to Action

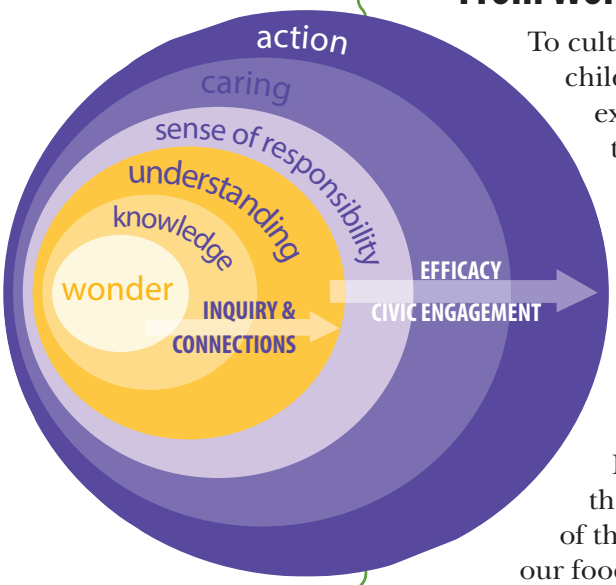


Figure 1. Moving from Wonder to Action
Special thanks to our colleague, Ewa Smuk, in Poland for helping us develop this graphic.

To cultivate a conservation ethic in the early years, we engage children's innate sense of wonder and curiosity as they explore the world through inquiry. We design curriculum that makes connections to relevant issues and to prior experiences. Ideally, we're building students' content knowledge, understanding of the Big Ideas of Sustainability, cultivating their creativity, and affirming their experiences. As children grow, this strong foundation of connection to their place develops a sense of stewardship. Through civic engagement and service-learning, we can deepen students' sense of responsibility and encourage habits of caring and action. Figure 1 describes the developmental scope and sequence that moves children from wonder to action over the course of their lifetime. Through caring relationships with nature, our food, and our communities, we are capable of participating in, creating, advocating for, visioning, and engaging in a healthy and just present and future.

Place-based Education

Place-based education (PBE), or place-based learning, immerses students in local heritage, cultures, landscapes, opportunities and experiences, and uses these contexts as a foundation for the study of language arts, mathematics, social studies, science and other subjects across the curriculum. PBE emphasizes learning through participation in service projects for and with the local school and community. Place-based education expert David Sobel says, "authentic environmental commitment emerges out of firsthand experiences with real places on a small, manageable scale."

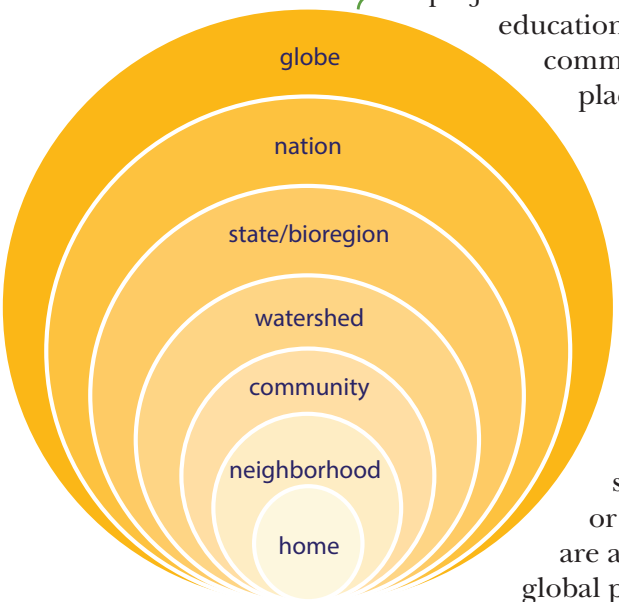


Figure 2: Home to Globe
(Sustainable Schools Project)

Place provides the context for learning in Education for Sustainability. When children know and have a deep connection to their place, they are more likely to care for and contribute to making that place a better place for all to live in. Figure 2 describes the developmental scope of children's ever-expanding sense of place. Our youngest children focus first on home, their classroom, then their whole school, and community. As they grow, their awareness of place expands. By middle school, children are exploring the watershed and state or bioregion, and by the time they reach high school, they are able to build on their knowledge to consider national and global perspectives.

Service-learning

Service-learning, initiated and driven by students, provides a key strategy in EFS for fostering in young people a sense of agency, or an

VOICE *from the* FIELD

Homework? At this age?

As the push on academics makes its way further and further down into early childhood classrooms, many teachers of young children find themselves required to assign homework. Meg O'Connor, first grade teacher at the Sustainability Academy at Lawrence Barnes in Burlington, Vermont shares, a solution.

Julie Brown and Meg O'Connor

As the school year began, my colleague, Julie Brown, and I were drafting our back-to-school letter. When we got to the part about our homework policy and expectations, we started to question ourselves and our goals for sending work home in first grade. After reflecting on the more traditional homework we had been sending home, math and reading, we both realized that our students' school day is very long and demanding. Most of our students are at school from 8:00am–5:30pm. We wanted to find a way to connect our school day to our students' home lives without creating more of a burden for our families and we also wanted to support the development of the whole child, instead of the more traditional focus on math and literacy. As a result, we created a homework checklist.

The checklist always looked the same and had the same directions. Some of the options were consistent from week to week: read or have someone read to you, exercise or play outside for 15 minutes and write what you did on the back, help cook a meal, talk about what you learned at school; other options varied to reflect our current academic lessons: count by 5's to 100, write five words that have "-at," tell a Writer's Workshop story, find five solids outside.

We also built in a routine around the homework. It went home every Friday and was not due back until the following Friday. We worked to make the checklist options things that every child and family could achieve and only asked that 10 items be checked off each week. The checklist turned out to meet the needs of many families and it was a wonderful way for us to learn more about what our students liked to do at home. We would often get little notes describing cooking projects or family hikes, which then added back to the richness of our classrooms.

understanding that they, as individuals, can make a difference. For young children, service-learning is most effective when the recipients of the service are close to home and directly related the child and his/her interests. Age-appropriate service-learning might look like a kitchen garden where children are growing food for their school, families, or community dinners. By giving young children the opportunity to make a positive difference in the lives of those they care about, they learn that they matter and that they do make a difference.

VOICE *from the* FIELD

Reflections on a Day of Service

Sue Blair's Day of Service Project. Sue teaches kindergarten at the Sustainability Academy at Lawrence Barnes Elementary School in Burlington, Vermont

Sue Blair

On a bright and sunny Tuesday in early May, students at the Sustainability Academy, along with teachers, parents, neighbors, and community members, participated in our Second Annual Day of Service. It was powerful to see every student at our school engaged in meaningful service-learning projects: painting murals, building compost piles, cleaning up the campus, planting an ABC garden, building bat houses, painting rain barrels, replanting peace gardens, and so much more. Everywhere you looked children were busy making a difference.

For me, the highlight of the day was watching our youngest students making such a big difference. For my kindergarten class, the day of service was the culminating activity in our year-long theme and study of "community helpers." It also reflected a shift in my teaching. I wanted students to "own their work," and make deeper interdisciplinary curriculum connections. I wanted students to know that their ideas mattered. By modifying Shelburne Farms' curriculum framework, Healthy Neighborhoods/Healthy Kids, for use with younger children, we moved our study of community from the classroom to the neighborhood. First, we drew maps of our neighborhood and identified the names of some of the streets near the school and their homes. Then, we met with community helpers who work hard to make our neighborhood a safe, happy, and healthy place for all to live in. Finally, we began to think about how each child could be a community helper.

You can download "Healthy Neighborhoods/ Healthy Kids Guide" for free at **www.sustainableschoolsproject.org**

Students decided it was important for our schoolyard and neighborhood to have animals and plants, to be clean, and to have safe places for kids to play in. Students were interested in assessing and improving these aspects of our neighborhood and school community. Students then went on neighborhood walks to evaluate those criteria. Was the neighborhood clean? Did it have animals and plants? Were there safe places to play? After the walks, students brainstormed

projects the class could do on the Day of Service to meet the needs that they had uncovered on their walks. Students planned to create a shade garden that would provide a habitat for animals, to build two sandboxes for kids to play in (our school didn't have any), and organized a neighborhood cleanup. The projects were completed on our Day of Service and the students were thrilled at the difference they made in our community.

Instead of just learning about community helpers, students learned that "We All Can Be Community Helpers!" Students are excited to play in their new sandboxes, to water and take care of the garden they planted, and to keep our schoolyard clean. They shared their ideas, worked hard, and made a big difference. Their pride in their work is evident. The sandboxes and gardens will make our schoolyard a better place for humans and animals, but the most important transformation is the students' emerging awareness that they can make a difference.

Here are some tips to cultivate self-efficacy, agency, and a culture of caring in young children:

- Listen to children when they have an idea for making a difference. Ask them questions to guide their thinking about what may or may not be feasible. Incorporate the planning of a project into your curriculum.
- Keep the duration of the project short. Young children's interests change rapidly. Service-learning will be most effective if children start and finish the project in a short amount of time without a lapse in between.
- Help children make connections between their interests, experiences, and learning by asking, "How can we help?" and "Is there something we can do?"
- Give children ample opportunities to learn how others in the community help, and then ask the children how they can help. Record their ideas. Encourage children to make a plan. Reflect on their plan and revise it based on new learning and understanding.
- Have children take care of something. Whether it's a houseplant, a garden, or a special place, teaching children to care builds the foundation for service-learning and civic engagement in the future.
- Keep projects close to home and concrete, where children can see the results of their work.

Anti-bias Education for Young Children & Ourselves

Louise Derman-Sparks and Julie Olsen Edwards' work is seminal in the field of early childhood education, diversity, and equity. *Anti-Bias Education for Young Learners and Ourselves* is a critical yet highly thoughtful approach to creating educational communities where all learners thrive. In addition to building humane classrooms and anti-bias practice, Derman-Sparks and Edwards support educators as they develop their own critical consciousness around power and privilege in an incredibly user friendly way. The learning in this book will support you in building a classroom, a curriculum, and a practice that honors the experience of all the children and families.

The Goals of Anti-bias Education

Based on the work of Louise Derman-Sparks and Julie Olsen Edwards in their book, Anti-Bias Education for Young Children and Ourselves *(NAEYC, 2010), p.4-6. See box above.*

1. Each child will demonstrate self-awareness, confidence, family pride, and positive social identities.
2. Each child will express comfort and joy with human diversity; accurate language for human differences; and deep, caring human connections.
3. Each child will increasingly recognize unfairness, have language to describe unfairness, and understand that unfairness hurts.
4. Each child will demonstrate empowerment and the skills to act, with others or alone, against prejudice and/or discriminatory actions.

Anti-bias education is vital to education for sustainability. In order for anyone to function at their highest level, we all need to be part of a community that values and respects who we are. Our education system isn't set up to embrace difference and value individuals, and the history and lived experience of many children and their families simply isn't acknowledged or valued in school culture. Many children do not see themselves reflected in their classroom, or often in their teacher's understanding of the world. An anti-bias education is intentional in its approach to creating equitable and just classrooms that not only reflect, embrace, and cultivate each child's experience, but work to acknowledge and dismantle oppression.

Biases, especially those that develop into systemic oppression, are learned. Young children's innate curiosity and lack of self-consciousness make them natural leaders in questioning and undoing oppression. Adults need to engage with them honestly, and often need to unlearn the biases we perpetuate.

Social justice is a key component of sustainability and as adults we have an obligation to identify and interrupt oppression. Regardless of developmental stage, our ability to be just stems from understanding who we are and how we fit into our social and cultural context. Affirming the identities, families, personalities, and culture of young children breeds strong self-concept and sense of belonging, which leads to understanding and empathy.

In the next section we have identified ways to set up your classroom for each thread. However, the suggestions included in the Thread,

Who Are We? (p.47), offer more in-depth guidance on how to create a welcoming and affirming learning space to help all children feel like they belong. Though we have identified these suggestions within that Thread, it is our hope that you will refer to these suggestions at all times.

Promising Practices of Early Childhood Education for Sustainability

Shelburne Farms has worked with teachers, schools, community partners, and governments nationally and internationally to develop and pioneer Education for Sustainability practices. Shelburne Farms' Education programs have engaged thousands of young children in exploring the world around them, cultivating their natural curiosity and sense of wonder, and fostering joyful relationships between children and their immediate worlds. The following practices have emerged from our collective Education for Sustainability and early childhood work. We believe these practices nourish the skills, knowledge, and attributes young children need in order to contribute to sustainable communities.

Promising Practices of Early Childhood! Education For Sustainability

PROMISING PRACTICE 1

Curriculum is integrated and place-based.

An integrated curriculum grounded in one's place—the local human and natural community—is key to Education for Sustainability in early childhood. In order for children to become citizens who are engaged in creating sustainable communities, they must care for, and understand the interconnectedness of their human and natural community and world. To foster this sense of caring and proclivity toward action, children must first be provided with the opportunity to explore and connect to their places, guided by their senses of wonder and curiosity.

EXAMPLE: A preschool class steps out the school doors to explore the community around them. Building capacity for safety and learning, the teachers start with short excursions outside the school yard, practicing walking safely on the sidewalks, sticking together, and going a little further each time out. As children's capacities grows, the class takes pictures of favorite or interesting spots. These photos are printed in triplicate to use in the classroom in a matching game and to be added to the class map. During a bread unit, the class visits various neighborhood stores to buy and taste a variety of breads representing many of the cultures in the classroom.

PROMISING PRACTICE 2

Learning and curriculum are play-based and emergent.

Learning is seamless and is led by the child's sense of wonder, curiosity, and innate ability to construct meaning through play. The teacher acts as a guide, creating opportunities for child-directed discovery, as well as facilitating learning experiences that build on the conversations, play, and questions that emerge from classroom dynamics and adventures.

EXAMPLE: A camp for preschool-age children spends the days outdoors in the forest. As the campers explore sections of the forest they create areas that represent Olympic challenges. Log walking and stump jumping are popular. Other campers create and play in castles and pirate ships fashioned from old stumps. When the teacher discovers a red eft, she gently captures it and invites the children over to examine it, and lets them take turns holding it. As she marvels at it with the children she asks them, "What else do you think we might find living here?" Later, the teacher suggests to the children that they could try walking like the red eft they found.

PROMISING PRACTICE 3

Sustainability is a lens.

When decisions need to be made, we might ask, "What would be a more sustainable choice?" Rather than being an add-on, Education for Sustainability provides an opportunity to use sustainability as a lens to envision the entire school or program—from how decisions are made, to curricular content, to purchasing supplies, configuration of outdoor play spaces, and connecting with families. Thinking and decision-making are guided by finding the optimal intersections of environmental integrity, social equity, and economic prosperity.

Promising Practices of Early Childhood! Education For Sustainability

continued.

EXAMPLE: A private pre-k program has a mission of social and racial justice and a commitment to maintain no racial majority within its program. Therefore, they offer sliding-scale tuition, and have eliminated the traditional financial aid and tuition program.

PROMISING PRACTICE 4 — Campus and classroom demonstrate and practice sustainability.

Young children learn by doing. When the campus demonstrates and models sustainability practices, young children innately learn, and thus practice, sustainability. In early childhood the implicit practices are just as important as the explicit curriculum. Practices such as classroom composting, reusing supplies, and democratic decision making in partnership with children all implicitly model sustainability for young learners.

EXAMPLE: Recycling, using environmentally friendly cleaning products, composting, and gardening are all regular parts of the pre-k and kindergarten classes' daily routines. In an effort to help young children to really understand composting, one class uses a small, clear plastic bin to collect food scraps, dead leaves, plants, and a few handfuls of soil to witness the process of their food being broken down into compost.

PROMISING PRACTICE 5 — Young children explore their connection to and relationship with the natural and built world through developmentally appropriate Big Ideas of Sustainability.

There are big ideas, or underlying concepts, that are fundamental to understanding and demonstrating sustainability. In early childhood these Big Ideas of Sustainability are: cycles, change, fairness, community, diversity, and interdependence. These ideas are integrated into the natural rhythm of and learning that happens in early childhood. Young children explore these big ideas and their relationship to them through inquiry, play, and exploring their classroom, school, and neighborhood communities in relevant and meaningful ways.

EXAMPLE: Preschool-age children dive into the Big Ideas of Animal and Plant Cycles, and Change Over Time, as they explore what happens to the garden and animals in winter. Trips to the snow-covered garden show that small creatures are making tiny tunnels through the snow. Garden plants, grasses, and weeds have gone to seed and many of the seeds are scattered on the snow. Their teacher reads books about animal adaptations in winter and the class decides to set up a similar habitat in their classroom. Teachers supply plastic tunnels, white sheets, and some puppets, and the children create an indoor habitat to mimic what they found outdoors. This focus leads to continued observation as the snow melts and plants begin to grow again in the spring.

PROMISING PRACTICE 6 — Young children have a voice, make decisions, and draw connections between their choices and the impact on their worlds.

Children need to see themselves as capable, knowledgeable, and participatory citizens. They need to be given the opportunity to make decisions, share their thinking, advocate for their needs and fairness, and problem solve to make a difference. Young children are capable of

Promising Practices of Early Childhood! Education For Sustainability

continued.

understanding and observing change over time, and how they affect their small world through everyday actions and words. When children are given the opportunity to shape their own world in childhood they will grow to have the ability to shape the larger world.

EXAMPLE: Kindergarten students decide it is important for their neighborhood and schoolyard to have animals and plants, to be clean, and to have safe places for kids to play in. Students go on neighborhood walks to evaluate if these features are present in their neighborhood and schoolyard. Following the walks, students brainstorm projects the class could do on a schoolwide Day of Service to meet the needs that they had uncovered on their walks. Students plan and carry out the creation of a shade garden to provide a habitat for animals, build two sandboxes, and organize a neighborhood clean-up.

PROMISING PRACTICE 7

Local and cultural perspectives are considered and learned through building healthy relationships with family, classroom, and community.

Investigating and exploring the local community is key to Education for Sustainability, especially in early childhood. Young children need to be connected with their natural and built communities in positive and healthy ways. They need to explore and experience natural cycles, human diversity, and healthy relationships with others and the environment. The local human and natural worlds are the context for learning and provide a framework for global comparisons as a child's worldview expands. Children investigate differences and explore multiple perspectives, respect, tolerance, and diversity.

EXAMPLE: As a part of their study of THE LITTLE RED HEN, the first grade begins to study the life cycle of wheat and the role bread plays in our diets. They visit a variety of local ethnic markets, grocery stores, and bodegas to find the different kinds of bread people in their community eat. At school, they hold a taste test and try all the different bread, sharing with one another the types of bread they eat at home.

PROMISING PRACTICE 8

Learning is relevant and connected to children's lives.

Embedding sustainability into the fabric and life of the curriculum and school is essential to developing the attitudes, skills, and knowledge in our children so they can contribute to and build sustainable communities now and into the future. Our young citizens need to see themselves as a part of their community and need their learning to be reflective of the lives they are living. When we allow the community and students' interests to guide learning and curriculum, academic achievement and engagement is high.

EXAMPLE: The kindergarten classes conduct a yearlong study of Community Helpers. As they learn about all the people and organizations that play meaningful roles in their community, and discover what they do, the children quickly begin to understand the importance of every member of their community. As the children explore how we all depend on each other, they start to appreciate the role these people and organizations play in their homes, classroom, and neighborhood communities. Through daily interactions, as well as several service projects, the children come to realize that, in fact, they are Community Helpers themselves.

Promising Practices of Early Childhood! Education For Sustainability

continued.

PROMISING PRACTICE 9

Children practice inquiry and open-ended questioning.

Scientific literacy and inquiry is crucial to building sustainable communities. It is essential for children to develop a healthy attitude toward, and understanding of, the environment. Inquiry is more than just asking questions; inquiry requires the learner to think critically, find and process information, use that information in real-life situations, and regularly engage in reflection—all vital twenty-first-century skills.

EXAMPLE: In a pre-k classroom, essential questions span several units of study. Questions are open enough to explore many topics of children's interests, but focused enough to allow children to make connections. When children explore "What's happening in winter?" focusing on the big ideas of change, cycles, and responsibility; they explore the changing landscape and weather from fall to winter, specifically observing trees, squirrels in their schoolyard, snowflakes, and how they take care of themselves and each other when the weather gets cold.

PROMISING PRACTICE 10

Anti-bias, equity, and justice form the foundation of our teaching.

Each one of us has a unique and vital role to play in creating the communities we want to be a part of, and the perspectives, experience, and background we bring shed more light together than they do in isolation. Creating classrooms and school communities with respect, justice, and equity at their heart—the kinds of classrooms that will allow each child to reach his or her true potential—require educators to investigate our own power and privilege and often reframe our understanding of identity. Each child and each family who enter our classrooms bring with them tremendous assets, and many of us also carry personal and communal histories of oppression. EFS demands that every single one of us commits to teaching, finding and using materials, and creating a classroom environment that honors the culture, family structure, gender identity, race, and gifts of all our students. We also must commit to identifying, intervening, and exploring oppression with our students.

EXAMPLE: Teaching faculty, administrators, and support staff spend the course of a year reading and discussing the book COURAGEOUS CONVERSATIONS ABOUT RACE by Glen Eric Singleton and Curtis Linton. The book explores the role of race in education. They begin to better understand what different racial, cultural, and gender identities mean for themselves and their students and start to change the materials (books, toys, games) in their classroom and some of the language they use (no longer saying "boys and girls," for example). They develop a greater capacity for identifying and interrupting oppression and a better understanding of systemic forms of oppression.

Engaging Families and Communities

Developing partnerships with community organizations and businesses is key to building a successful early childhood EFS program. Partnerships can be formed in multiple ways, to meet a variety of needs, and are almost always mutually beneficial. Schools gain by developing relationships with their neighbors, and by making learning relevant and real, expanding the context for learning beyond the classroom. Community partners benefit from the opportunity to share their resources and work with the school and families. Students gain by seeing that learning happens both inside and outside of school.

Building relationships with families is also essential to developing a strong EFS program and community. When children see their family and culture as a part of the school and their learning experiences, they are better able to make the transition from home to school, and to feel the relevance of what they are learning outside the home. We know that children are generally more successful in school when their caregivers are engaged in their education, and families who feel more comfortable in the school community are more likely to be involved. Likewise, when families see the community as part of their child's education and learning, they are better able to support their children's learning beyond the classroom.

Families and Parents as Experts

It is vital for teachers to begin building relationships by getting to know students and their families as soon as possible. Home visits are an excellent way to start off the year, but if that isn't possible, "families as experts" conferences can often get the year off to a meaningful start. This allows educators not only to get to know children and their families, but to build trust and open lines of communication. Asking questions about how students learn, live, and play will help teachers establish classroom communities that reflect all families and all children.

Families can contribute to the life of a school in many ways that include, but aren't limited to, the classroom. Learning about the skills, interests, resources, and expertise families might like to share. Ask families what will work well for them in terms of communicating with the school and in what ways they are most interested in being involved. Talk about how family members can best support children's learning. The more you know about the grown ups who live with and care for your students, the better you will be able to work together to support each child's learning. You'll also be better

able to meet the needs of your classroom and school by knowing who makes up your community. Communicate with families regularly about what you're exploring as a class and look for opportunities to connect this learning to home and community.

Family Volunteers

Some programs encourage families to volunteer on a regular basis, while others make opportunities available as needed or when interest arises. Volunteering deepens upon a parent's or family member's connection to the school and establishes a culture of responsibility, stewardship, care, and community. It's vital to remember that families have wildly different schedules and resources, and not everyone is able to commit the same amount of time, money, or resources to a school community. It's important that all families still feel like partners in their child's experience.

Community Dinners

One sure way to gather a large group of people is around food—when meals are shared in a community setting, it allows many families to participate and build relationships with the school and one another. Community dinners are excellent ways to share student learning, learn from the community, try new foods, and most importantly, get to know one another in a family-friendly setting. Try the following:

- Host community dinners a few times a year with a seasonal theme.
- Engage children in the seed-to-table process, by growing the food, planning the menu, and cooking and serving the food.
- Invite families to share what is special to them by sharing meaningful family foods, either by bringing a dish for a potluck or helping to create the menu. Consider collecting the recipes to create a school cookbook!
- Work with local businesses, restaurants, organizations, and community members to share their resources, information, and activities with your school audience.
- Highlight a particular classroom project or curriculum theme so families can learn more about what children are exploring and learning.

Showcasing Student Work or Adventures

Families love learning about, hearing stories of, and seeing pictures of their children's learning. Post photos and capture dialogue of an adventure, trip, or learning experience for families to see and learn more about what children are doing while they are away from home. Children can choose which photos to share, and draw, write, or dictate their experience. By asking children, "How can we share our special places?", you'll encourage reflection and ownership of their learning. Photos and stories will help children recall and transfer their learning, remembering where they went, what they did, and how they did it.

VOICE *from the* FIELD

Building Capacity for Community Outings

Burlington Children's Space, Burlington, Vermont. BCS is an NAEYC accredited early care and education program dedicated to serving all populations.

From our first days together, we begin building a foundation for successful outings with children, parents, and staff. As we leave the safety of our school to venture into the community, the children's skills develop and their abilities grow. We celebrate the successful moments and process the challenges. As the spaces we visit become more familiar and the children build confidence in exploration, these places become part of our culture—familiar scripts develop more complexities, and what was unexpected transforms into the anticipated.

Our age-appropriate outings build on clear expectations, routines, and a sense of adventure. As trust grows, we build skills. For infants, outings may consist of a grassy, lush lawn; a patch of dry dirt; a large puddle; or a cold mound of freshly fallen snow. The children move through and explore the space, employing sensory skills like touching and feeling. What are children's reactions, likes, and dislikes? The shared experience is meaningful and meets each learner's diverse needs.

As young as one year old, toddlers rely less on riding strollers and take short walking trips in the neighborhood, to the community garden, or to nearby parks. Through communicating clear expectations and using supportive language, we support children in mastering skills of crossing the street, sharing the sidewalk, and greeting community neighbors. Teachers practice establishing these expectations and boundaries for each space they visit. We always communicate with each other about where we are going, how we will use the space when we get there, and how we will handle the unexpected.

Preschoolers act as mentors to the older toddler children and soon collaborate on outings. We describe the destination to build anticipation before the groups come together to walk through the local neighborhoods. Sometimes when the toddlers return to school, they are greeted and celebrated by the preschoolers.

When adjustments need to be made, and at times the group returns to school, the children hear, "we'll try again another day." This allows the morale to stay high as the group comes back to school and keeps the time together positive. After a break, such as a new year, a return from vacation, or even a weekend, it is necessary to rebuild the trust and routines needed for successful outings.

Prior to each outing, teachers prepare by gaining familiarity with the space on their own and discussing their findings with each other. Teachers are extremely resourceful and are always thinking about what places would work for their group and will hold meaning for children.

Once we have visited a site with the group, we give children another chance to explore some of the materials and experiences we may have dabbled in when in the community. We do this by bringing these experiences into the classroom, a place where children, teachers, and parents may be more comfortable and willing to take risks. We allow children to investigate at their own pace in the classroom, build questions and theories, and then reinvestigate based on their newly gained knowledge. We document and discuss with each other, as well as with families, where we have been, what we did, and what we saw. We invite families to share their community trips through stories, photos, and artifacts. We reflect together. We share, document, and discuss with each other and parents again. We build trust. It is part of the teacher's job to show parents how outings are a worthwhile part of our curriculum. This reciprocal relationship between the classroom and the community continues.

TIPS FOR SUCCESS

Familiarity: Teachers have to know the space, the route, and the risks and resources (including bathrooms, water, bus stops, etc.). Take practice walks without children to become familiar with the area.

The Journey: The people you meet are not to be avoided, but greeted and included as part of the learning experience. Teachers at BCS consider this an important part of outings, allowing children to be active participants in their community. The guidelines they establish and interactions they model set the tone for this sort of advocacy.

Preparation: It's important for the teacher to be aware of children's anxieties or worries about outings. Teachers need to make sure children will be warm enough, have comfortable shoes, provide bathroom opportunities, and offer food for the extra energy they may need.

Trust: Collaboration and trust is essential between the teachers, children, and groups. Teachers need to be able to communicate fears and worries to others so a plan can be made. If a group member does not like crossing busy streets or is concerned about poison ivy, then a different route or destination can be planned. Addressing these concerns as a team allows for the team to decide if they will address the fear or find an alternative.

Ownership: Involve children in all phases of the outing from making snacks, to voting on destinations, to packing the "outing bag" and helping each other when a problem comes up.

Flexibility: Children can be involved in finding routes, making maps, photographing landmarks along the route, discussing which way to go when reaching an intersection, estimating the length (in minutes, steps, or miles) of a leg of the trip, or documenting what they see along the way. A camera and journals are essential tools.

A Tale of Two Early Childhood Education for Sustainability Programs

Education for Sustainability early childhood programming can take place in any setting. Here we share with you stories from two of our keystone programs, the Shelburne Farms Adventures Program, held in the rural, farm-based setting of Shelburne Farms, and the Pre-Kindergarten Program at the Sustainability Academy at Lawrence Barnes, a public pre-k program housed in an urban elementary school.

VOICE *from the* FIELD

Entirely! Shelburne Farms Outdoors Adventures Camp

"Can we go back and play in nature's playground?"

"I'm hungry, can we eat those vegetables?"

"I wonder if the fairies left us a note."

— Campers, Week 1, Outdoor Adventures Camp

Linda Wellings

Linda Wellings, Early Childhood Education Coordinator

Shelburne Farms has been offering summer day camps for young children for over twenty years. Camps vary from half- to all-day for children ages four to seventeen. Camps for younger children are based out of our main building, the Farm Barn. They start each day in a classroom then head out on the land for adventures. Our primary goal for our Adventure Early Childhood Program is to be outdoors throughout the seasons as much as possible. This summer, after much discussion, excitement, and trepidation, we decided to conduct our all-day camps for five-, six-, and seven-year-olds entirely outdoors.

When the staff envisioned the program, we knew we didn't want it to be the indoor camp moved outside. We wanted minimal supplies and to depend on the wonders of the forest and fields to provide motivation and loose parts

Who needs playdough when mud and clay are on hand in the woods?

with which to explore and play. Our only supplies were birch-bark-covered journals, pencils, markers, crayons, kid-sized garden tools, plastic buckets to move wood chips around, and lots of good children's books—both fiction and nonfiction—relating to the animals and plants of the forest, fields, and garden. We also brought some cooking tools: bowls, knives, cutting boards, foil, s'more supplies, and matches. Farm staff cut kid-sized stumps and chairs to use around the campfire and two beautiful, rough-slab wooden tables.

Our only furniture for the camp were these rough-slab wooden tables.

This new offering required some additional communication with families on the logistics of spending the entire day outside, and what it would mean for their child: drop off in the forest by our sugarhouse, snack and lunch in the woods or fields, rolling logs over to peek underneath, digging in the garden, getting dirty, and having fun! It would also involve using a Port-o-let, or going to the bathroom in the woods! We made sure parents understood this new set up, and gave them the opportunity to put their child into another camp. No one requested a move.

As the first day of camp approached, we were ready to go, but anxious. How would campers and parents react to this new setting? Our "outdoor classroom" was up a hill behind the barn—could parents navigate the hill? Would it be accessible for the campers and their families? Though we had a Plan B for those parents or guardians who could not manage the climb, we still worried. Staff was also apprehensive about following a more emergent teaching plan. What would we do each day? Would we have the materials we needed? Would kids be comfortable, have fun, and learn?

All these questions were answered on the first day of camp! Parents loved the walk up the hill; it was a great start to the day. Campers immediately started exploring their new "classroom," looking under logs, drawing in their journals, and making tree-cookie necklaces. At our first circle gathering we set three guidelines for the week. On birch bark we wrote: Respect, Be Safe, and Have Fun. After talking about what the guidelines would look, sound, and feel like, we hiked up to Sheep's Knoll for morning snack. We were astounded by our campers' appetites for both food and learning.

Nature's own materials inspired the imagination and creative play of the campers.

As the week progressed, we continued to be awed by our campers. Their enthusiasm for creating a daily plan built around their own interests reinforced our decision to teach in a more emergent way. Parents' stories supported this decision. When asking her daughter what was on tap for tomorrow at camp, one mother was told, "Don't worry, the teachers will ask

what we would like to do and we'll tell them." We closed each day by talking with the campers about the possibilities for tomorrow; their suggestions became the adventure choices for the next day.

We started the week with a big pile of wood chips purposefully situated near our campsite. Every day upon entry, several campers would pick up tools and get to work, filling buckets with chips and spreading them out around our site where they thought chips were needed. Throughout the day, different children would tackle the chip pile. Slowly but steadily, the chip pile decreased.

The first week of camp coincided with the Olympics, and one morning a group of campers decided to create an Olympic stump-jumping event! Tree stumps around the fire circle were arranged so that children had to walk on stumps and never put their feet on the ground. We also had downed-tree-balance-beam-walking and vine-swinging events!

Camp coincided with the 2012 Summer Olympics, which inspired some "eventing!"

A large, upturned stump also held magic. Several mornings it became a pirate ship (we definitely heard threats of someone having to walk the plank!). A forest area where wild grapevines hang like perfect Tarzan swings where children can climb nature's jungle gym became a daily destination for some, while others continued down the wooded path to Fairyville and spent their time creating fairy houses. These campers would return daily to check and see if the fairies had left any notes. They were sure the slabs of wood with beetle carvings were written by the fairies and only needed translation for them to understand the message.

Our staff welcomed this play and would also engage campers in other options: turning over logs to look for salamanders and other critters, reading books, writing in journals, or harvesting garden vegetables. Every day was easily filled with age-appropriate experiences for our campers, based both in the natural world and in fantasy. We were pleasantly surprised by how the days flew by when we let children help determine the events of the day. We shared responsibility for our adventures and everyone benefited.

As the first week closed, the staff unanimously agreed that the move outdoors had been a huge success. But what about the parents? Their sentiments were obvious as each day they hung around after camp was over and were led by their children to visit the garden or nature's playground. On the last morning we had a campfire and parents did not want to leave. Formal camp evaluations came back with glowing remarks; such as, "being outside all day made it so unique," or, "the meeting place was fantastic." With such good feeling from campers, parents, and staff, we are eager to add more "totally outdoor camps" next summer. We are also planning to bring what we learned in the woods this summer to make better use of our outdoor classroom throughout the year, even in winter!

VOICE *from the* FIELD

Sustainability Academy Preschool

Ruth Kagle, Sustainability Academy Preschool Educator, Burlington, Vermont

The Sustainability Academy Preschool opened in September, 2011, with funding from the Vermont Community Preschool Collaborative. Located in a public elementary school, it is a collaboration between the Burlington School District, Head Start, and Shelburne Farms. Unlike traditional images of Vermont, our school neighborhood is decidedly urban, mostly low-income, and rich with cultural and linguistic diversity. Our multi-age morning and afternoon programs reflect these demographics and include both typically developing children and children with special needs.

At the end of our first year, we reflected on our program's initial successes and challenges. We celebrated the development of a nurturing preschool community where our values are evident in classroom practices such as recycling and composting and children are engaged in hands-on, interconnected, nature-based learning experiences. We also acknowledged that we were still at the beginning of our journey to fully encompass the goals of Education for Sustainability and we identified extending learning opportunities outside the classroom as an area of growth for our program.

Although we wanted to spend more time outside, it needed to be meaningful learning time, intentionally planned, and connected to our curriculum. We wanted to include outdoor learning as early as possible in the school year but we needed to know that children were ready to follow teacher directions. We wanted children to be engaged and we needed them to be safe. In short, we shared the concerns of many other preschool classrooms. Here's how we got started in the second week of the 2012–13 school year.

The children arrive; some race toward the open door, ready with smiles and hugs, others are still tentative, holding tight to their grown-up's hand. Some families stop to chat with teachers, others rush to leave for work. Some simply say "hello" and "goodbye," carefully using the English words they have also taught their children. One grandfather puts his hands together and slightly bows his head as he looks at me and says, "namaste." He gently reminds his child to do the same before I repeat the greeting he has taught me.

Like most preschools, we have spent the first days establishing routines and getting to know one another. We have introduced new materials with stories and learning opportunities focused around color exploration. Children have explored color mixing with painting, playdough and at the water table; shared and graphed their favorite colors; and met Pete the Cat and his many-colored shoes. For the past couple of days we've been using a collection of paint chips to practice a color hunt-and-match game in the classroom. During morning meeting, we tell the children that we think they're ready to play the game outside.

It's a beautiful, warm fall day, so no lengthy outdoor dressing is needed. A teacher grabs the backpack with our emergency kit and other supplies. We review our safety rules and how to play the game. Each child takes a paint chip to use in their color hunt. We're ready to go.

We open the door and see the parking lot, the dumpsters, and flapping garbage. The world is full of color! A blue car, a green dumpster, a red wrapper. Then a brown squirrel on a silver chain link fence, a yellow leaf, pink chalk on a grey sidewalk, green grass, a brown tree trunk, blue sky, white clouds, black birds, orange tomato hiding in last year's raised bed garden; we are still less than ten feet from the classroom door.

We walk along the narrow strip of grass outside our school and children excitedly hunt for their colors. Gradually they begin to slow down and focus, carefully observing their environment. Budding friendships grow a little stronger as children work together to find each other's colors. Children with limited words eagerly tug on hands and point to communicate their findings. They notice the many different colors of leaves, flowers, insects, toys in the neighbors' yards, the school bricks.

We reach the busy street outside the school and our focus widens again with an onslaught of noise and color; buildings, cars, trucks, street signs and people. A child sees a bright red truck and is desperate to rush across the street and put his paint chip on its shiny surface. We stop and review our safety rules, especially staying on the sidewalk. We meet another teacher on the street and children giggle as they match their paint chips to her clothes and brightly colored bag. They explore the white letters on a blue sign and the child with a blue chip happily identifies another color match. As we walk, children point out familiar landmarks; the grocery store, the big kids' playground, the street where Grandma lives.

We walk just one block along the busy road before turning onto a side street that leads us back into school grounds. Children who never enter school this way discover the colorful murals painted on these walls. They explore the brightly painted images and everyone finds a color match.

At our playground, we meet one of the children's grandmothers. She often arrives early and sits watching the children play. She speaks no English; each day we simply exchange smiles and nods. Today she is wearing a bright red cardigan. The child with the red paint chip triumphantly barrels toward her and for a moment I fear he may knock her down. He doesn't. She looks at his delighted face and at the paint chip firmly planted on her cardigan and suddenly she laughs. We exchange amused smiles and I feel our community expand as we share our learning game. The children dash into the playground and the game now includes slides and sandboxes.

We have returned safely from our big adventure. It was just a walk around the block but all adventures have to begin somewhere. We found that opening the door is a good place to start.

The Threads

When children have the opportunity to revisit places and ideas, they are able to build on prior experiences. This helps them to make sense of the interconnectedness of the world. Each of the four Threads in this section guides student exploration by focusing on an Essential Question and a few Big Idea(s) of Sustainability. Each Thread offers students multiple opportunities to explore their world. The Threads offer suggestions on how to create an immersive learning experience in your classroom, as well as provide a variety of facilitated and self-guided learning opportunities that flow throughout the seasons.

Beginning with the End in Mind

> **"Teachers are designers. An essential act of our profession is the design of curriculum and learning experiences to meet specified purposes."**
>
> *— Wiggins and McTighe*

When designing curriculum, it can be tempting to begin with a single learning activity familiar to you or one that you think your students will love. Yet when curriculum is built one activity at a time, we risk creating a string of unconnected learning experiences that focus on content rather than the big picture. Instead, when the curriculum design process begins by first identifying the intended outcome(s), goals, and big ideas we want children to come away with, we're often able to provide more relevance and context to facilitate children's learning. This allows children to make real-world connections, construct meaning, and begin to truly understand what they are learning. In creating this guide, we've applied elements of the "backward design" curriculum development process, based on the work of Grant Wiggins and Jay McTighe *(Understanding by Design)*, to guide our investigations of nature, food, and community.

As you explore each Thread, or Essential Question, you may find that you and the children are more drawn to one of the Thread's Big Ideas than another. You may also find that your students express their understanding or learning in different ways—that's okay. There are a variety of Enduring Understandings for each Thread, giving educators opportunities to work with what is most meaningful in their classrooms. However you approach it, the Essential Questions, Big Ideas, and Enduring Understandings help you frame the learning and make

WHAT'S THE Big Idea?

The Big Ideas of Sustainability

Change Over Time: All organisms, places, and systems are constantly changing.

Community: A group of living and non-living things sharing a common purpose or space.

Cycles: Every organism and system goes through different stages.

Diversity: All systems and places function because of variety.

Fairness / Equity: Organisms must share resources to meet the needs of living things equally, across places and generations.

Interdependence: All living things are connected. Every organism, system, and place depends on others.

connections from adventure to adventure and season to season.

Essential Questions

Essential Questions are open-ended and have no one answer. They are intentionally examined throughout the course of study as children discover, explore, and make connections between current and prior learning experiences. Post your Essential Question in your classroom and ask it again and again. Share your Essential Question with families and ask them to explore the question at home. With a focus on Essential Questions, you'll find children naturally asking the question and making connections between experiences in the classroom, at home, and in the community.

Big Ideas

Big ideas provide context, and help us see a bigger picture. By breaking down a huge concept like sustainability into big ideas, we're better able to parse its meaning and to create meaningful learning opportunities for children. The Big Ideas act as a guide for learning new and relevant information, and help us make sense of things. Part One of this guide offers more detail on the Big Ideas of Sustainability. Use the Big Ideas of each Thread to connect learning to the big picture and overall concept you want your children to learn and explore.

Enduring Understandings

Enduring Understandings articulate what it is we want children to know or learn as a result of their experience. Enduring Understandings take learning one step further than Big Ideas. The Enduring Understandings in each Thread elaborate on and clarify what children may take away from their investigation of the Thread's Big Ideas and Essential Questions.

Documentation and Assessment

Each Thread offers a variety of opportunities to reflect on, document, and assess learning. Observe children and note their engagement in each self-guided or facilitated learning experience. With the Big Ideas and Enduring Understandings in mind, talk with children about their experiences and thoughts. Use the discussion questions provided with each Facilitated Learning Experience to process the experience with children.

Children's learning, both inside and outside, can be documented and displayed throughout the classroom. Photographs, journal entries (by children or teachers), or treasures (such as bird nests, or nut shells left behind by a squirrel) can all serve as artifacts of learning. By bringing some of the "outside" inside, children can continue to make observations and ask questions about their community and nature. Teachers can post the Essential Question in a prominent spot in the classroom and refer to it as the basis for repeated discussions. Children develop and refine their understandings through revisiting the question. Be sure to allow students to express this learning in a variety of ways, including drawing and conversation.

A **learning wall**, which is a dynamic, collaborative bulletin board, can display the children's artifacts of learning, such as their drawings, maps, photographs, or treasures they've found in their backyards or on their way to school. Co-creating a map of your community can provide children the opportunity develop their sense of place and mental mapping, and provide a place to note the site of their discoveries. Use a learning wall to gauge understanding by observing the display of children's reflections on their experiences. Revisit the learning wall frequently. Make it an interactive learning and assessment tool as you review prior additions and invite new contributions following each Facilitated Learning Experience.

Self-guided Learning Opportunities and Facilitated Learning

Experiences provide opportunities for students to engage with the Thread and Essential Question through a balance of self-guided play and facilitated experiences. We believe that both elements are essential for students to discover, explore, and construct meaning.

VOICE *from the* FIELD

Essential Questions in Early Childhood: Framing and Connecting Learning

Angela McGregor Hedstrom, Universal Pre-K,
Dryden Elementary School & Happy Way Childcare Center, Dryden, NY


Angela McGregor Hedstrom

Essential Questions are the framework for curriculum integration, providing a place to organize our Enduring Understandings and Big Ideas. Picture them like a sturdy branch, on which we can hang mobiles of interconnected ideas, tie together diverse experiences, climb to places of new learning, and swing from question to question. Essential Questions connect students to the processes of their place. The questions are engaging and inspire inquiry. Their timeframe is flexible—they can be used for each in-depth unit of study. The questions may overlap several units, explore a specific season, or connect yearlong learning. Especially in early childhood education, they can be reflected in everything students do at school from sensory activities, art projects, reading in the library, math investigations, singing, and meeting in circle time.

In my classroom, Essential Questions tend to arc across several units of study. For example "What's happening in winter?" supported the Big Ideas of change, cycles, and responsibility. This took us about two months as we explored the changing landscape and weather from fall to winter, specifically observing trees, squirrels in our schoolyard, how we take care of ourselves and each other when the weather gets cold, and snowflakes. Questions like this are open enough to explore many topics of students' interest, but focused enough to provide that vital place to hang our connections. Below are strategies I have found useful for using Essential Questions in early childhood.

Post the question prominently.

We wrote our question on large paper and posted it in our gathering area. We sometimes made an additional banner to accompany student work displays in the hallway.

Illustrate the question.

Start with a simple visual of what the question is about and populate the space as you continue to explore. For our question "What's happening up in the sky?" we started with paper cut outs of clouds and as our studies took us to explore birds, we added photographs of birds. Eventually our exploration took us to the moon. At this point we added photos and drawings of the sun, Earth, moon, space shuttles, and stars.

Illustrate the responses.

Record student responses to the question at various times throughout the exploration to assess evolving understanding. Sometimes I write what students dictate to me and draw a quick visual to accompany

their words. Other times, I give them index cards to draw their responses, and then I document their words to accompany the pictures. These responses stay posted with the questions throughout the exploration.

Include parents, community partners, and your unique place.

To help answer our question "What is wonderful about water?" we met with a grandparent who is a marine biologist, a parent brought in shells and sand from a recent trip to the beach, another parent brought in rocks and logs from the pond near their house, and our music and movement teacher led activities about water and undersea creatures. We collected snow from our schoolyard to explore states of matter.

Craft questions that reflect students' own experiences and emerging interests.

Our question "What's happening up in the sky?" emerged after "What's happening in winter?" I think we were spending so much time looking up at trees and squirrel nests, that when the trees lost all of their leaves we were collectively more aware of the sky—airplane trails, storm clouds, birds flying south, the bright sun on a cold snowy day, and of course, beyond. Because Essential Questions undoubtedly lead to more questions, keep track of these and use with students to make decisions about further explorations.

Use words that young children can access and interpret for themselves.

I like the term "happening" because it's about process. How does that work? Why is it the way it is? Who is involved? What does it look, smell, feel, sound, taste like? How does it change? How does it impact us? We could scientifically explain what is happening in winter, but with Essential Questions like this we really want to engage in the processes though experience, observation, and discovery. I also like to use words like "wonderful" and "special" to describe a specific theme. Asking "What is wonderful about water?" and "What is special about seeds?" invites learners to make meaning of the topic for themselves based on experience and sharing ideas with others.

We concluded our year with the Essential Question, "How does our garden grow?" Local farmers and gardeners visited as guest teachers. We encouraged plant-themed dramatic play, provided science and math investigations, and grew plants in our classroom. We explored the Big Ideas of interdependence and diversity. This question also provided the opportunity to reflect on our class as a diverse and beautiful garden, and our growth as individuals and as a community.

Seasonal Adventures throughout the Threads

> **"In the world of nature, every month is slightly different from the next, and so is every season. But interestingly, what makes each month unique does not vary that much, year after year."**
>
> — *Clare Walker Leslie* (Nature All Year Long, *1991)*

The ever-changing seasonal landscape of the outdoors provides a place where learning and curriculum can be engaging, tangible, and inspiring. We enjoy eating fresh berries in the summer, watching the leaves change colors in the fall, going sledding in the winter, and hearing the sound of spring peepers and robins in the spring. Even if the climate doesn't change much where you live, most people find themselves excited for the next seasonal celebration or cyclical event. With changes all around us, it is only natural to reminisce about what happened last year at that same time and look forward to the imminent changes in the landscape.

Each Thread offers an array of seasonally appropriate Facilitated Learning Experiences. The cyclical nature of the seasons provides abundant opportunities for children to visit, discover, explore, inquire, pretend, wonder, and perpetually reexamine as each season unfolds and new learning opportunities emerge. For young children, these changes may stimulate new questions about why the leaves are changing color or why the sap is running.

> **"This winter is weird. Last year there was snow over my head all winter long. This winter there isn't any snow and I don't even have to wear my jacket."**
>
> — *Ryland Leddy, Age 4, Burlington, Vermont*

Children are inquisitive and observant. Teaching by the seasons allows a child's questions about the world around him or her to become the springboard for your curriculum and the learning experiences in your classroom. It encourages children to take notice and make observations—all critical skills in early childhood.

Wherever you live, you'll find a variety of ideas in each Thread for engaging children in answering their own questions about the world around them.

Connecting with Families

We believe that a strong family-school relationship benefits everyone. But in order to truly connect with your children's families, you must get to know them, and cultivate these relationships over time. Home visits are an ideal way to get to know families, but there are other ways to establish face-to-face connections. Remember, however, that what works for one family might not work for another. For example, a letter home will not allow families with limited literacy or English proficiency to grasp your message. Figure out how best to communicate with each family to share what is happening in the classroom.

- Face-to-face conversations at drop off and pick up or another arranged time
- Host a meal or gathering in your classroom
- Organize a school event or service project
- Phone calls, emails, or letters home (even text messaging!)
- Create a website or blog, Facebook, or Twitter account

Loose Parts, Play Spaces, and the Outdoor Classroom

Loose Parts

Cardboard boxes: one of the wonders of childhood. Who hasn't seen a child prefer playing with a box over the new toy that came inside it? The theory of loose parts is based on the premise that an object with an undefined purpose offers a child more opportunities for creative play than a toy with a clearly defined purpose. Loose parts are everyday objects—cardboard boxes, stones, plastic cups, shells, baskets, sand, straws, feathers, blocks—you name it. Loose parts offer children unlimited opportunities to develop creative and physical capacity. The movement, change, choice, design, and material management of loose parts support children's creative problem solving ability. Loose parts work well in any setting, but are especially suited for outdoor or dramatic play. As they work independently or together, children naturally negotiate how to use the materials.

Play Spaces

Play spaces in which children navigate complex environments, ripe with sensory stimuli, provide learning opportunities beyond specific lessons or play activities. Prefabricated plastic and metal playgrounds don't provide the sensory stimulation or diverse terrain that children need in order to develop healthy brain pathways and gross-motor function. Nature-based play spaces provide rich ground for the development of both fine- and

Camilla Rockwell, **Mother Nature's Child (DVD)**
www.mothernaturesmovie.com

gross-motor skills, as children navigate uneven terrain and different surfaces. *(Camilla Rockwell, Mother Nature's Child, DVD)*

Outdoor play spaces can take the form of gardens, green spaces, shorelines, sand pits, wooded areas, or anywhere else that feels safe for small children. Shady areas, like unused corridors alongside of buildings, can become landscaped streams or cultivated wetlands where students can explore the water cycle and ecosystems. Stools can be made from tree stumps, and blocks can be fashioned from logs. Play materials can be gathered from the outside and brought indoors when students can't be outside safely. Water tables can be filled with mud, snow, or stones; and wood scraps, acorns, and sticks can be brought inside as building materials.

Young children need toys that they can use to create storylines and process their learning. Puppets, dress-up clothing, kitchens and work benches, water and sand tables, blocks and building materials, toy animals and dolls with different skin tones and clothing allow a child to be creative and imaginative. Recycling household items, such as real pots and pans, kitchen utensils, old film cameras, clothespins, and old notebooks, can become excellent materials for learning through play. By modeling the principles and values of sustainability in the choice of play materials, we can start to shift the culture of school and make sustainability tangible. These props become a teaching tool not only for children, but for families as they come in and out of the classroom.

Outdoor Classroom

An outdoor classroom is different from an outdoor play space—it is a more defined learning space where children can gather in a group and expect more formal instruction. This space can serve many of the same functions as your indoor classroom; for example, for morning meetings, read-alouds, or class discussions, and need not be mutually exclusive from outdoor play areas. The outdoor classroom space can be anywhere—any natural area where the children can gather in a circle—and you can change its locations to suit your needs. Because children spend so much of their time outdoors in free, unstructured play, they may need practice and instruction on the expectations for their behavior in an outdoor classroom.

Setting Up for Success in Outdoor Adventures

Before you venture out, you need to set expectations for your outdoor adventures, just as you do for your classroom. Use the same expectations and language that you use in the classroom for consistency. Remind children that the outdoors is home to many animals and plants, and just as children want those visiting their homes to be respectful, so they, too, must be respectful in outdoor settings: don't pick living plants, leave wild creatures, etc. You'll also need to develop expectations for behavior around sticks, stones, snowballs, etc. Inevitably, sticks are used as weapons and/or smacked against trees and rocks. That kind of behavior becomes a safety threat, so it's best to know how you want to handle it and set those expectations with children before it comes up. It can be helpful to discuss all your guidelines for expected behaviors with colleagues ahead of time, so that you can negotiate and establish your collective expectations.

Send information home to parents about the proper clothes for their children to wear on outdoor adventures such as hats, both in winter and summer, boots or close-toed shoes, and layers of clothing to match the weather. If parents are unable to provide the appropriate clothing, ask for donations or hold clothing drives to meet your needs. PTOs and PTAs will often supply fund-raising money to help with the proper clothing. Summer garage sales are a good place to buy all sorts of clothing at a reasonable price. Equally important is reminding parents to do tick checks if the class has been in the fields or woods. Send home pictures of what to look for and what to do if one is found.

When setting out on an outdoor adventure, make sure you are properly dressed with appropriate shoes and clothing to model for your students how they should dress. Ideally, each child would have a small backpack or bag they can carry on their back so their hands are free. Their bag would contain their own journal/clipboard, writing tools, toilet-paper-roll binoculars, and water bottle.

What to Pack:

- first aid kit with emergency health forms, EPI pens if needed
- cell phone
- water bottle(s)
- sunscreen
- camera
- extra gloves, socks, and hats in winter
- if a long outing, small snacks for energy
- magnifying glasses or boxes
- extra pencils (+ small sharpener)
- markers
- paper

To avoid a disappointing first excursion, practice walking together, and build capacity by walking a little farther and longer each time. Some children who are not familiar with the outdoors are fearful of the unknown; be supportive as they break down those fears. Often our own fears can impact our students' experiences. It is helpful to be aware of your own comfort level as well as the body and verbal language you bring to outdoor experiences.

At Shelburne Farms, we remind children that they are much bigger than many of the creatures we may encounter such as salamanders, frogs, and earthworms. We encourage them to be "gentle giants"

and return all living creatures back to their homes. We'll ask them to cover their hands with soil before picking up salamanders and worms, as these creatures breathe through their skin and lotions and soaps could harm them. *The Salamander Room* by Anne Mazer is a wonderful story to share with children to illustrate the need to leave wild critters in the wild.

Most of all, enjoy yourselves! The rewards of being outdoors with your class brings so many benefits for both the children and you.

A Word about Ticks & Tick Safety

Ewww!

deer ticks are tiny, the size of a poppy seed

Ticks can latch onto your clothes, skin or a pet's fur as you hike through the woods, walk through tall grass, or simply play in the backyard. Ticks often move to a warm, moist part of the body, such as the armpit, hair or groin, where they bite and feed by sucking blood. Though most are harmless, ticks can spread diseases such as Lyme disease. The most common ticks are deer ticks and dog ticks. If you find a tick on yourself or your child, remove it with tweezers as quickly as possible, and swab the wound with antibiotic ointment.

How to Check for Ticks:

1. Check your hair first. Run your fingers flat against your scalp and over your entire head. Hold your fingers together and use both hands. Touch your entire scalp, and feel for small bumps or objects against your head. If your hair is long, pull it up when you're finished.

2. Look over the rest of your body from the top down. Some ticks are very small, so look carefully at your skin. You are looking for a small, round, black or brown bump. Stand in front of a long mirror to look at your back side or ask a parent for help.

3. Raise your arms and check your armpits. Ticks like dark areas, so check your male and female parts just in case. Chances are that ticks ran up the outside of your clothing to your head, but it is better to be safe than sorry.

4. Put on some clean clothes. If you've made it this far without finding a tick, you are good to go.

Overview of Threads

Who Are We?

Thread: WHO ARE WE?

Who Are We? guides children to discover how who we are builds and shapes healthy communities and ecosystems. Through this exploration of the diversity of the human and natural world, young children will have the opportunity to examine who they are and what they see. By considering the questions, "Who am I?" "Who are you?" and "Who are we?", children develop empathy, the ability to understand multiple perspectives, and an awareness of themselves and the world around them. They'll observe patterns, make observations, sort and classify, and consider how differences contribute to healthy and fair communities.

Who Lives Here?

Thread: WHO LIVES HERE?

Who Lives Here? introduces children to the people, plants, and animals of their place. By asking and exploring the question, Who Lives Here? children discover how our human, natural, and agricultural communities are interdependent. Children will develop a strong understanding and sense of community and place, as well as begin to grasp how they are interdependent—no matter where they live.

What's Happening?

Thread: WHAT'S HAPPENING?

What's Happening? is an opportunity to explore, observe, discover, and examine how people, plants, animals, and communities change over times. This Thread focuses on building understanding of human and natural life cycles, adaptations, and transformations, as well as the interplay between the human and natural world. By studying how someone or something changes over time, students learn that our world is cyclical and in a constant state of flux. By returning to a place or concept throughout the year students form a deep understanding and appreciation of their place—which is foundational to cultivating stewardship.

How Are We Connected?

Thread: HOW ARE WE CONNECTED?

How Are We Connected? cultivates an awareness and appreciation of what sustains us: our food, fiber, and relationships. This Thread provides an opportunity to deepen our connection with our local food system. Beginning with our air, soil, water, and space, we begin the exploration of food, fiber, family and friends. We weave, knead, bake, and create products that we use and eat, and discover the joy of living with gratitude and in relationship to the world around us.

How to Use Threads

Each Thread is designed to stand alone as an in-depth focus for exploring our world over an extended period of time. They also provide inspiration and resources as you design your own course of study. Multiple Threads can be woven together to meet the needs of your classroom.

Designing learning opportunities that connect to the seasons makes learning relevant, rich, and meaningful for children. You may use each Thread to stimulate conversations or interest around particular questions or seasonal events. You might also use a Thread based on the questions or interests of your students. Maybe your children are particularly interested in learning more about the animals that live in their neighborhood, or in discovering the similarities and differences of the trees in your schoolyard. We have organized the Facilitated Learning Experiences into particular seasons with which we feel they are best aligned. However, we acknowledge that many experiences can and should be repeated throughout the year or with a different focus. Feel free to adapt and modify the experiences to be used in other seasons, to fit with the themes of other Threads, or to explore other Essential Questions that you generate with your students.

What is a Thread? To sum it up!

A Thread presents the context and content through which children will explore an Essential Question and some Big Ideas of Sustainability.

Essential Question

The title of the Thread, the question that teachers and students can ask and apply to all experiences throughout the Thread.

Big Ideas

The Big Ideas of Sustainability are concepts that describe different aspects or components of sustainability. Because sustainability is such a complex idea, breaking it down into smaller elements make it easier to learn and teach. The Big Ideas specified in each Thread provide context to help children understand and make sense of what they are learning.

Enduring Understandings

Enduring Understandings elaborate on the Big Ideas by defining some understandings that we hope children come to through their exploration of the Essential Question and Big Ideas.

Connecting beyond the Classroom

Family Connections, Service-learning Opportunities, & Community Connections

When using an Education for Sustainability framework, the best learning often happens when the walls of the classroom dissolve, and learning happens everywhere: at home, in nature, out in the community. When children have an opportunity to contribute to the wellbeing of their human and natural communities, they begin to understand their ability to make a postitive change in the world. This section offers suggestion on how teachers can engage families in exploring the Big Ideas and Essential Questions at home and in the community.

Self-guided Opportunities

Since children learn best through self-directed play, providing a variety of choices and materials throughout the classroom is an ideal way to promote learning. This section offers suggestions on materials that can be offered for children to explore. Many of the Facilitated Learning Experiences, once introduced, can also provide great opportunities for students to explore further on their own.

Loose Parts

Loose parts are movable props (natural and human-made) that children can use in a variety of ways, indoors and outdoors, as they play. Parts can be stacked, aligned, piled, moved, taken apart, and reassembled. They have no rules and can be used to suit the child's imagination. We list ideas for loose parts related to the Thread in this section.

Dramatic Play

Children learn through doing, and engaging in dramatic play allows them to experiment, explore roles, and develop language skills. This section suggests props that reflect the Thread, which children can incorporate into fantasy and role-playing.

Outdoor Play

Unstructured time and space for children to engage in self-directed outdoor play is crucial for children to develop a relationship with the natural world. This section offers suggestions on ways students can engage in unstructured play in an outdoor setting, including tools for exploration and discovery.

Art

An art studio or area provides an opportunity for children to creatively express themselves, as well as develop fine-motor skills. This section identifies materials and supplies connected to the Thread for students to express their ideas.

Literacy

Developing children's language and literacy skills is a core component of early childhood education. This section, which we call "Linda's Picks," lists engaging books to help children develop these skills. Additional titles are listed in individual facilitated learning experiences. Provide opportunities for children to engage with literature throughout the room. Post photographs taken during the course of study, offer journaling as an activity choice, and invite students to label dramatic play props and art projects. Maps can provide models of words that connect to the community.

Numeracy

The early childhood classroom introduces children to numeracy and math. Children count, compare, classify, sort, graph, tally, as they learn about the Big Ideas in each Thread. This section will provide ideas for materials and activities to support the development of children's numeracy skills.

Explore Table

The Explore Table is a place where children can investigate and explore items related to the Thread topic. This section offers ideas on items to include at the Explore Table.

Facilitated Learning Experiences

Facilitated Learning Experiences, traditionally called *activities* or *lessons*, help teach and engage children in exploring the Essential Question throughout the seasons. Each experience lists objectives, materials, specific Big Ideas and Enduring Understandings, literacy connections, directions, discussion questions, and extensions.

Who Are We?

Who Are We? guides children to discover how who we are builds and shapes our communities and ecosystems. Through this exploration of the diversity of the human and natural world, young children will examine who they are and what they see. By considering the questions, "Who am I? Who are you?" and "Who are we?" children develop empathy, the ability to understand multiple perspectives, and an awareness of themselves and the world around them. They'll observe patterns, make observations, sort and classify, and consider how differences contribute to healthy and fair communities.

WHAT'S THE **Big Idea?**

- **Diversity:** All systems and places function because of variety.
- **Fairness / Equity:** Organisms must share resources to meet the needs of living things equally, across places and generations.

*See p.18 for the **Goals of Anti-bias Education** as described by by Louise Derman-Sparks and Julie Olsen Edwards.*

Enduring Understandings

- Each living thing is unique and special.
- Each living thing belongs to a community, and is part of different groups within a community.
- Every living thing has intrinsic value.
- Every living thing contributes to its community and groups.
- Living things have different needs and meet them in different ways.
- Healthy communities and systems require diversity.
- Every living thing experiences the world differently.
- All living things share similarities and have differences.

Dear Families,

We are so excited to be embarking on an exploration of **Who Are We?** We wanted to share our plans with you so that you might discuss what we are learning with your child.

Our goal is to help your child develop an understanding of and appreciation for how our similarities and differences create healthy communities and ecosystems. We will be exploring the questions *Who am I? Who are you?* and *Who are we?* to help your child develop self-awareness and empathy for other people and living things, as well as understanding of **diversity** and fairness **(or equity).** Children will come to understand the following:

- Each living thing is unique and special.
- Each living thing belongs to a community and is part of different groups within a community.
- Every living thing has intrinsic value.
- Every living thing contributes to its community and groups.
- Living things have different needs and meet them in different ways.
- Healthy communities and systems require diversity.
- Every living thing experiences the world differently.
- All living things share similarities and have differences.

To support this learning at home, talk with your child about your family culture and traditions. Share family history with your child. Talk about what makes your family unique and special, as well as what makes your family similar to other families. Encourage your child to explore and discover themselves and others.

Thank you!

WHAT'S the "BIG IDEA?"

Diversity: All systems and places function because of variety.

Fairness / Equity: Organisms must share resources to meet the needs of living things equally, across places and generations.

Connecting beyond the Classroom

Family Connections

To connect families with *Who Are We?* post a large calendar in a visible area that families have access to and invite families to post events that are important to them, including religious and cultural celebrations. Learn about these events and invite families to come in to share their traditions and celebrations with the children. Ask each family to send in family photos (offer to lend a digital camera) and display the photos in the classroom, giving each child the opportunity to see their loved ones in their classroom. Consider creating a community map, on which each child can identify his or her home. You might ask families to send in a favorite family recipe, invite family members to come prepare their recipes with your class, or host a classrooom potluck.

Community Connections

To support *Who Are We?*, reach out to community organizations that do social justice work. These might include organizations that deal with childhood health and nutrition, hunger and homelessness, public health, adult education, or environmental justice. Get to know these organizations and what they offer to the community. Provide multiple opportunities for children to explore who and what is in their community, both natural and built. Help children learn about and become familiar with shared community resources like the library, playgrounds, or pool. Children can get library cards, learn where to play, or find other ways to engage with what the community has to offer. Connect with your local municipal government to learn about the work that they do. Many towns have websites that list the different roles and responsibilities of town offices and organizations. As you connect with the community, it's essential to share these partnerships with families. This serves a double purpose: it shares what's happening in the classroom with families and provides an opportunity for families to continue the community connections from home.

Service-learning Opportunities

As children get to know their community, work with them to identify authentic community needs around which they might generate a service or service-learning project. Service-learning allows children to make a positive difference in the quality of life in their community. Partnering with local organizations involved in social justice or municipal organizations to learn about their work can often lead to a collaborative project. For example, learning about the town's Public Works Department might lead to a gardening project. Learning about childhood nutrition and health might lead to a child-created cookbook to be shared with the community.

Thread: WHO ARE WE?

Self-guided Opportunities

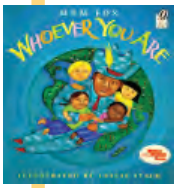
Loose Parts

A variety of blocks can provide a solid foundation for your loose parts collection: wooden blocks, Brillo blocks, Lincoln Logs®, LEGOs®, DUPLOs®, or cardboard brick, Basically, any type of blocks will work. Gather other natural building materials like sticks and logs as well. Household items like mirrors and empty food containers can serve double duty for both loose parts and dramatic play. Make sure that empty food containers reflect the food items that the children in your care eat. You might even ask children to bring in empty containers to contribute to the collection. A variety of modeling materials can also make great additions: playdough, clay, or oobleck.

Linda's Picks

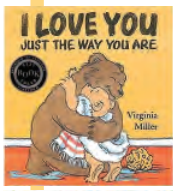
for WHO ARE WE?

Our Grandparents: A Global Album by Maya Aimera, Sheila Kinkade, Cynthia Pon. *Charlesbridge Publishing, Watertown, MA, 2010.*

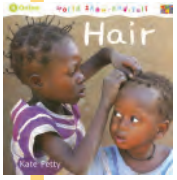


Whoever You Are by Mem Fox. *Harcourt, NY, NY, 1997.*

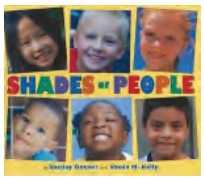
I Am Freedom's Child by Bill Martin. *Trumpet Book Club, NY, NY, 1993.*



I Love You Just the Way You Are by Virgina Willer. *Walker & Co., NY, NY, 2000*



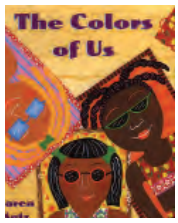
Hair by Kate Pelty. *Cooper Square, Lanham, MD, 2006.*



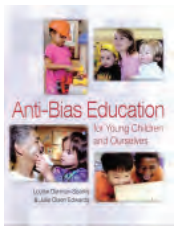
Shades of People by Shelley Rotner and Shelia M. Kelly. *Holiday House, NY, NY, 2009.*

Sometimes I'm Bombaloo by Rachel Vail. *Scholastic, NY, NY, 2005.*

What Is A Scientist? by Barbara Lehn. *Millbrook Press, 1999.*



The Colors of Us by Karen Katz. *Square Fish, 2002.*



Anti-Bias Education for Young Children and Ourselves by Louise Derman-Sparks & Julie Olsen Edwards. *NAEYC, Washington, DC, 2010.* *See p.18.*

Dramatic Play

At all times, not just for this Thread, it's vital that children see themselves reflected in all aspects of their classroom. In the dramatic play area, this means including dolls with a variety of skin tones, dress-up clothes that reflect what children see their families wear at home, and pretend food items that represent what children eat at home. Home visits can provide you with essential information in order to know the children in your care.

Outdoor Play

Offer children the opportunity to play in a variety of outdoor settings (a public park, a meadow, the forest, near water), so they can begin to identify different ecological communities. Encourage children to notice how your community changes by season and what people (or communities) do when the seasons change. Help children notice what other living things in your community do as the seasons change (do they hibernate, go dormant, or migrate?). Encourage children to imitate through play what they observe. They may create homes for a variety of different animals.

Art

The art area should include a variety of artists' media: watercolors, tempera paint, fingerpaints, oil pastels, crayons, collage, sponges, bits for mosaics. Provide mirrors and photographs of children and their families to inspire portraiture. Include examples of art from around the world. Display portraits of artists to show what artists look like. Be sure to include a mirror in this display to show that we are all artists. Nametags or necklaces can be created from slices of tree limbs (affectionately called tree cookies at Shelburne Farms).

Numeracy

Offering items for children to sort and classify in multiple ways is a great way to build flexible thinking. A bowl of fruit, for example, can be sorted in infinite ways: by color, shape, peel or no peel, like or dislike, etc. Children can explore the diversity around them by looking for patterns and identifying similarities and differences.

Explore Table

Fill your Explore Table with a variety of objects such as rocks, stones, feathers, buttons, seashells, or seeds. Encourage children to explore what the objects have in common and how t hey differe. Children can use recycled egg cartons as holders for various collections of items. Alternatively, offer only one type of object (e.g., pinecones), and discuss how the children feel about having only one type of object compared to having a diversity of choices.

VOICE *from the* FIELD

One of These Things Is Not Like the Other

Sarah Kadden, Shelburne Farms Educator and Education for Sustainability Partnerships Coordinator

The practice of sorting and classifying is quite common in early learning, but what does it mean and what does it teach?

My discomfort with teaching or encouraging children to sort and classify emerged around human difference, and the mental models created by our beliefs around "similar" and "different." At Shelburne Farms, we often use an activity called "People Key" to teach about dichotomous tree identification. In "People Key," the facilitator chooses an observable characteristic in the students and "sorts" them. The students then figure out how they were sorted. The characteristic is usually something like lace-up shoes versus Velcro shoes, or hats versus no hats. The idea is to teach children how scientists sort, classify, and identify trees by noticing and identifying their differences. But here's the thing: scientists often have more at their disposal than one-time visual observation, and more importantly, scientists' first impressions can be wrong.

I'm actively involved in social justice and anti-racism work, and the "People Key" activity has always made me feel uncomfortable. It feels arbitrary and potentially dangerous. The characteristics we observe in people and the way we sort and classify them can have real consequences in our lives because of the value others ascribe to these characteristics, whether it's lace-up shoes or perceptions of income. Also, these immediately observable characteristics aren't always meaningful or real. This holds true for people, other living things, and basically any observable thing.

Let's talk about race for a moment. Early race theorists attempted to divide people into categories. They sorted and classified people based on their perceptions of difference, and they believed these to be real, indisputable distinctions. They didn't take into account the genuine connectivity between humans within a whole system, and they didn't have any idea of the true breadth of humanity. The categories they chose were arbitrary and essentially meaningless, but the categories were immediately ascribed value, and those values have held fast, and have developed into deeply oppressive racist systems.

Systems thinker Donella Meadows describes these meaningless or untrue categories as "nonexistent boundaries." She explains, "Everything, as they say, is connected to everything else, and not neatly. There is no clearly determinable boundary between the sea and the land, between sociology and anthropology, between a car's exhaust and your nose. There are only boundaries of word, thought, perception and social agreement—artificial, mental-model boundaries." (*Meadows, p. 95*). According to

Meadows, "We have to invent boundaries for clarity and sanity; and boundaries can produce problems when we forget that we've artificially created them." (*Meadows, p. 97*). The problem is that many of us don't realize we function with artificially created boundaries.

I was working the other day with a colleague who is an Assistant Dean in a school of Natural Resources. She described overhearing some of her graduate students at lunch singing the Sesame Street sorting classic, "One of these things is not like the other." As soon as she mentioned it, the next phrase popped into my head automatically: "One of these things just doesn't belong."

Sorting and classifying carries the risk of identifying things, or people, as "not belonging." And that builds a mental model where not belonging becomes real.

But *everyone* belongs in my classroom, and in my community.

How can we support young children in their navigation and budding understanding of the world, and their understanding of similar and different? How can we offer opportunities for the development of healthy mental models? If I had the solution I'd give it to you, but for now, I'm committed to using the ideas of similar and different, and sorting and classifying with a healthy dose of openness and skepticism. I try to offer children (and adults) the opportunity to explore their perceptions and assumptions, and provide gentle challenges where I can. Why do we separate boys from girls sometimes? Why is it important that we acknowledge the difference between yellow and green? Does it matter if his lunch box has dinosaurs on it and yours has unicorns?

When we teach children to sort and classify based on their perceptions of difference while they have extremely limited information, we teach them to constantly differentiate, and to believe that those boundaries are real and merit exclusion. It's the work of Education for Sustainability to break down some of those erroneous and ultimately damaging beliefs and allow inquiry, compassion, and creativity to flow. And to let everyone, and everything, belong.

Meadows, Donella H. *Thinking in Systems: A Primer*. Chelsea Griffin Publishing, White River Junction, Vermont, 2008.

Who Are We?

WHAT'S THE **Big Idea?**
Diversity
Fairness/ Equity

Facilitated Learning Experiences:

KEY: Community • Food & Farming • Nature

EVERY SEASON

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Color Search

WHAT'S THE **Big Idea?**
Diversity

Enduring Understandings

- The world is made up of many different colors.
- There are different colors for different reasons.
- Everything is unique and special.

Objectives

- Children develop their observation and matching skills.
- Children discover the diversity of colors found in the world around them.

Directions

It can be helpful for children to develop their "owl eyes" (see *What's Happening?* p.131) prior to beginning this experience.

1. Explain that you will be going on a "Color Search." Typically, this can be done as a walk outside, but consider what kind of adventure or classroom experience makes sense for your students. Have the children predict the colors they might see on their "Color Search."
2. As your class is searching, have students name some of the colors they see. Were their predictions accurate? Did they see any colors they didn't predict? Do they think they've named all the colors now?
3. Hand out the color sample chips and challenge the children to find a match for the color they've been given. Remember, the goal is to have them experience a diversity of colors.
4. You can facilitate this activity in one of two ways: you may want to begin with having children look for their color matches on things that belong to that place, such as rocks, mosses, trees, ground debris, signs, buildings, etc. You can also have them approach this activity thinking about different skin tones. Either way, it's vital that children are allowed to acknowledge and name what they notice about human difference (see box).

Materials

- color sample chips (You can find paint sample cards, formica top samples, or paint samples on wooden squares at a hardware store. You could also use scraps of colored paper or colored pipe cleaners.)
- ***The Colors of Us*** by Karen Katz

The Colors of Us

People have different hair, eye, and skin colors and they wear different colored clothing. When we discourage children from voicing what they notice about people, we teach them that human difference is taboo. Young children also often believe different skin colors have different values, because those messages run deep in our culture and media. But all skin, hair, and eye colors are beautiful, and none have more intrinsic value than others. The value we perceive and ascribe to skin, hair and eye color are the foundations of stereotypes and bias. It is our job as teachers to foster a constructive conversation about human difference that acknowledges and affirms the colors of all people. *The Colors of Us*, by Karen Katz is an excellent resource.

Extensions

- ***The Black Book of Colors*** by Menena Cottin and Rosana Faria. This book is all in black but it has raised pictures of objects along with Braille.
- ***Color Dance*** by Ann Jonas
- ***Sky Color*** by Peter H. Reynolds
- ***All the Colors of the Earth*** by Sheila Hamanaka
- "Shape Search": A variety of shapes cut from paper can be substituted for colors, or you can use three dimensional objects (a ball or a pair of dice).
- Place a specific textured object (sandpaper, cotton, etc.) in a bag. Have students feel what's in the bag (NO PEEKING!), describe how the object feels, then find something in nature that has a similar texture.
- Use an empty egg carton to collect samples of your color. Talk with children about not picking someone's flowers or taking personal belongings to include in their collection. When in a natural area, meadow, or field, talk about what ground rules you and your children want to maintain.
- Give each child a color chip that they keep throughout the year. One teacher made her students' nametags from color chips and students looked for color matches through the seasons.

5. As children find their matches, offer them more color chips to choose from. They can work independently or in small groups.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What colors did you think you'd see?
- What colors surprised you?
- What were some of the color matches you made?
- Why do you think _____ (item) was _____ (color)?
- Why do you think there are so many different colors out there?
- Do you think there is a different time of year when it would be easier to find some of the colors?
- Why is it important that there are different colors in the world?
- What color words would you use to describe the color of your skin?

Incredible Compost

WHAT'S THE **Big Idea?**
Diversity

Enduring Understandings

- Healthy compost needs a variety of ingredients.
- Food plants, like fruits and vegetables, grow in soil.
- Healthy compost helps gardens grow better to support healthier communities.
- Leftover food scraps can be "recycled" by being broken down into compost and returned to the soil to help new plants grow.

Objectives

- Children show interest and curiosity in how compost is made and used.
- Children discover that all food breaks down into smaller components that can be used in compost.
- Children experiment with decaying food.

Materials

- ***Compost Stew: An A to Z Recipe for the Earth*** by Mary McKenna Siddals
- clear plastic container with a lid
- sticks and dead leaves (can be collected by children)
- soil
- food scraps

Directions

1. Read *Compost Stew: An A to Z Recipe for the Earth* by Mary McKenna Siddals. Discuss the process of how food decomposes and why it is important to compost. Young children often put their food scraps into a compost bucket but they rarely get to see the decomposing take place.
2. Tell your students they will get to witness this process in their classroom but they will have to help with it. Explain that a working compost pile needs both dead and living ingredients to make it work efficiently, and you will go collect what your compost pile needs.
3. Take the children for a hike to gather carbon material, such as dead leaves, straw, dead grass, sticks (small enough to fit in the bottom of your plastic container). Also collect a bucket of soil. If these things are not readily available, collect these materials at another location and bring them to your classroom.
4. Look in your compost bucket for the other important ingredients—kitchen food scraps! You can also include other nitrogen-rich items, such as green grass clippings, weeds, newly fallen leaves—anything that's green and fresh.
5. Have the children lay the sticks on the bottom of your large plastic container, add a layer of dried dead items, then a layer of the kitchen scraps, and then a layer of soil. Use enough soil to cover the kitchen scraps to prevent fruit flies from hatching. Always keep your food

stirring the compost

the compost bucket: soil, straw, dead leaves, food scraps, water

scraps covered with soil or dried, dead leaves to keep fruit flies from breeding.

6. If the soil you added is dry, spray water on the layers. Moisture helps break down the solids. A container this size will not be able to decompose all your classroom waste, this is a model so your students can keep an eye on how the decomposition process works.
7. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions. Return to the discussion each time you stir or examine the compost.
8. Every four to five days stir the compost, so air can get into the system. Once again, make sure all the food is cover with soil or leaves. Students can keep a record of how many days it took various food scraps to decompose.
9. Use your compost in your class garden or a container garden.

Discussion Questions

- What did we put in our "compost stew"?
- What do you think will happen to the food scrap? What will happen to the other "ingredients"?
- What is happening now? (Return to this question each time you examine the compost.) What is different than last time? What do you think will happen next time we look?

Extensions

- ***Composting Nature's Recyclers*** by Robin Koontz
- Have a compost bucket in your room, encourage the entire school to compost for your school garden.
- Keep a calendar to record how the food breaks down. What type of food breaks down first? What food scrap takes the longest to decompose?
- Sing "The Compost Song."

The Compost Song

Sung to the tune of
"Take Me out to the Ball Game"

Take me out to the compost
Take me out to the pile.
Add some soil and a few good worms
I don't care if I'm turned and I'm churned.
'Cause it's root, root, root for the microbes;
If they don't win it's a shame.
For in two, four, six weeks, I'm out
in the old garden!

Written by Pam Ahern, teacher at Waits River School, East Corinth, VT

Community Potlucks

WHAT'S THE **Big Idea?**
Diversity

Enduring Understandings

- A community works together.
- Everyone contributes to their community.
- Healthy systems are diverse systems.

Objectives

- Children demonstrate an understanding of their own home culture and its value.
- Children cultivate an appreciation for the culture and contributions of other.
- Children show interest and curiosity about other people, new foods, and their own community.
- Children discover new foods, traditions, and friendships.
- Children experiment with food and community building.
- Children play-act community interactions, cooking, hosting and sharing.

Directions

1. Begin a conversation with children about the foods they eat at home with their families. You may have them draw or write about the kinds of foods they eat at home, do some play cooking, serving, and eating meals, and lead a discussion.
2. Brainstorm with the children how they could share foods from their home families with people from their school family. If the children are unfamiliar with the idea of a potluck, introduce the idea.
3. Work with the children to organize the potluck. First, find a space and establish a date and time to hold the potluck. Create and send invitations to families and the community, then brainstorm recipes and foods to be made in the classroom.
4. Identify adults who can help serve and organize the potluck. Children can prepare food in school, decorate the space, and help to set up, but you will also need plenty of adults!
5. Host a potluck!
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What foods did you try at the potluck?
- What surprised you about the foods served?
- What did you enjoy most about the community psotluck?

Materials

- access to school cafeteria with serving and eating utensils

Extensions

- Children create posters and write invitations to invite community members and families to the potluck dinner.
- With the help of teachers, children organize entertainment for the night.
- Create a cookbook of the recipes of all the food served at the potluck, self-publish it, and sell it as a fundraiser.

Natural Dyes

WHAT'S THE **Big Idea?** **Diversity**

Materials

- ***Charlie Needs a Cloak*** by Tomie dePaola
- wool fleece (Check online for sources to purchase wool. For example, www.pitchfork.org sells raw, dirty fleece and www.zwool.com sells clean roving for spinning or felting batt for felting projects.)
- plants and berries (See list on next page for suggestions.)
- mordants: alum and cream of tartar

Great Teacher Resources!

Harvesting Color: How to Find Plants and Make Natural Dyes by Rebecca Burgess

The Handbook of Natural Plant Dyes: Personalize Your Craft with Organic Colors from Acorns, Blackberries, Coffee by Sasha Duerr

Enduring Understandings

- All systems function because of variety.
- Color adds diversity to arts and crafts.
- Different colors can be mixed to form new colors.
- Colors can be changed.
- Colors come from different places.

Objectives

- Children cultivate an appreciation of various colors.
- Children show interest and curiosity in creating natural dyes.
- Children discover that various plants make certain colors.
- Children experiment with natural materials to make dyes.

Directions

When gathering natural dye materials, be sure to consult books ahead of time to learn about endangered, threatened, and protected flora, or flora that should be avoided for other reasons (i.e., poison ivy, stinging nettles).

Experiment with the following recipe and make up others as you go! No set amount of dye material is listed because dyeing with natural dyes is an adventure. Dye materials will produce a slightly different shade every time. Generally, the longer you simmer the wool in the dye, the darker the color will be.

There is no hard and fast rule for making dyes, although in most cases the raw materials must be heated to release their colors. Most anything that grows in fields and around your house can produce wonderfully soft, beautiful colors. A mordant is a dyesetter, necessary to bring out and hold the color in the wool.

1. Read *Charlie Needs a Cloak* by Tomie dePaola. Discuss how Charlie used red berries to dye his wool red. Ask if anyone has ever picked or eaten blueberries. What happened to their fingers?
2. Explain that the children are going to do some experimenting with dyeing wool with plants and berries.
3. If possible, have the children hike around the schoolyard to look for plants and berries with which to experiment. If your schoolyard has a limited number of plants, ask children to bring some from home or plan a walk around the neighborhood. Check with neighbors before picking any of their plants!

Examples of Seasonal Sources

Spring

Source:	Plant part used:	Mordant:	Color:
Sumac	young shoots	none needed	tan/dark brown
Bloodroot	roots	alum	red-orange

Autumn

Source:	Part needed:	Mordant:	Color:
Sumac	berries	alum	yellowish tan
Zinnias	flower heads	alum	yellow

Other Suggestions: *(Color results will vary.)*

yellow-gold: Burdock, Queen Anne's Lace (use the whole plant)
rusts and golds: Marigolds, onion skins
green-yellow: bracken fern (use the fiddleheads before they unroll to get green), spinach, Mullein (leaves)
browns and tans: walnut hulls, tree barks, coffee, tea
blues and grays: blueberries, elderberries
purples and grays: dandelion roots, wild cherries
reds: cranberries

4. Once you have the plants, follow this sample recipe and discover with your students what colors the plants make.
5. Boil a pot of onion skins in water. Add salt and alum. Boil for at least 30 minutes, adding water as needed. Cool, strain out the skins, then add wet, washed wool or other materials to be dyed. Place the pot over heat again and simmer (never boil) for at least 30 minutes, then rinse the wool in cold water. Dry the wool or other material slowly in the shade.
6. Experiment with other plants to explore the diversity of colors nature can produce. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What surprised you about natural dyes?
- What other plants would you like to try to use to dye wool?
- What else would you like to dye?
- How do you think colors are formed?

Setting the Color

Natural dyes will fade or bleed unless first boiled with a mordant. Different mordants produce different colors from the same dye. Remember to mordant your wool in a well ventilated area.

Common Mordants

Alum *(alum potassium sulfate)*: Also called pickling alum. It is the safest to use with children and can be found at a drugstore or grocery store.

Iron *(ferrous sulfate)*: If you boil your dyes in an iron pot you will not need to use this mordant. Iron tends to darken colors.

Cream of Tartar: Used in combination with a metallic salt usually used in combination with alum. Brightens colors.

Extensions

- Use your dye to color playdough.
- Dye sheets of white paper to create your own colored papers. Use the paper to create collages or mosaics!
- Try natural dyes on cotton t-shirts.

Taste Tests: "Try It, You'll Like It"

WHAT'S THE **Big Idea?**
Diversity

Materials

- ***I Will Never Not Ever Eat a Tomato*** by Lauren Child
- small samples of different foods
- small paper cups for sampling
- tally sheets to register students' reactions to the food tasted (Appendix, p.255)

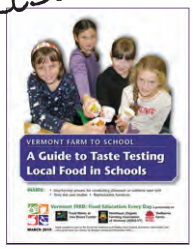
Enduring Understandings

- There are many different tastes in the world.
- Our preferences for tastes can change over time: some things take time to get used to.
- Everyone's preferences for tastes are unique. What tastes good to me might not taste good to you; or "Don't yuck my yum!"
- "Variety is the spice of life."

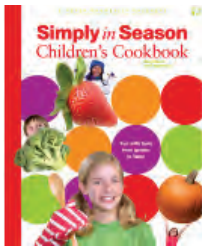
Objectives

- Children demonstrate the willingness to try new foods.
- Children show interest, curiosity and appreciation about a diversity of foods.
- Children experiment with tasting different foods.
- Children begin to learn to harvest, prepare, and serve food.
- Children develop an appreciation of foods from different families and cultures.

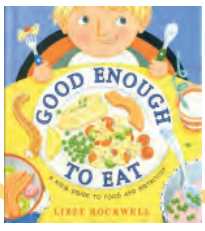
Great Teacher Resources!



A Guide to Taste Testing Local Foods in Schools by Vermont Farm to School. Download free at www.vtfeed.org



Simply In Season Children's Cookbook: Fun with Food from Garden to Table by Mark Beach and Julie Kauffman

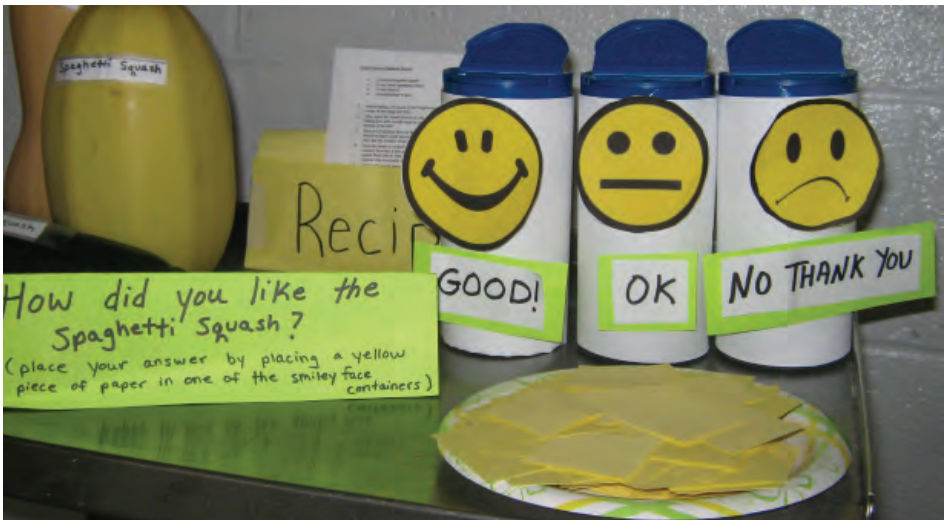


Good Enough to Eat: Kid's Guide to Food and Nutrition by Lizzy Rockwell

Directions

Taste tests can be simply trying new foods in your classroom or they can be a schoolwide effort to have students make healthier food choices. In early childhood classrooms, taste tests can happen as frequently as you like and should introduce children to new foods whenever possible. In addition to fresh fruits and vegetables, we encourage you to include foods that are special to children and their families, or that are important to the different cultures represented in your classroom. These foods may be fresh fruits and vegetables that aren't common in your area or dishes that your families prepare or purchase. We have found that scaffolding taste tests by beginning with the raw food, moving on to a cooked version, and then finally trying a processed version allows children to develop an appreciation of and willingness to try new foods when they encounter them in meals. For example, you might start with raw broccoli, then try it roasted, sautéed, or steamed with different seasonings, and finally offer a broccoli soup.)

If you have a school garden, harvest a crop with your students and find a recipe that they'd like to try. If you do not have a garden, work with the food service staff to use foods that are available through the cafeteria. This collaboration can help cut down on food waste in the cafeteria.



Young children can vote on taste tests using simple smile, frown, or straight face symbols.

Students who have previously sampled a food in their classrooms are more likely to eat that same food when it is later served in the cafeteria.

1. Read *I Will Never Not Ever Eat a Tomato* by Lauren Child. Discuss if anyone has ever felt that way about eating certain foods. Explain that your class will be holding taste tests throughout the year. The goal will be for children to try new and different foods. Consider using this experience with "Eating the Rainbow," p.81 to reinforce the importance of eating a variety of foods.
2. Offer small servings in a positive, non-coercive atmosphere. Invite children who are familiar with the food (and like it) to share what they like about it.
3. Have students help prepare the food; if they make it, they are more likely to eat it. If students grow and prep the food, this also improves the odds that they will try it.
4. After the children try a food, have them share their reactions. They can tally their preferences on a graph, write a simple smiley, frown or straight face to show their preferences, or be part of an open discussion of how they felt about the food sample.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- How did you feel about the taste test?
- What did you learn about yourself during the taste tests?
- How has your attitude toward trying new or different foods changed?
- Can you think of a food that you used to not like but now you do?
- Can you think of foods that taste better to you when eaten together rather than separately?

Extensions

- Invite local farmers to school to talk about the produce or food they grew that the children will use in taste tests.
- Host a "cook off" with other classes. Trade foods to taste test and determine which food was more popular.
- Work with food service staff and families. Perhaps food service can provide the foods and family members can help with facilitating the actual taste tests.
- ***Oliver's Vegetables*** by Vivian French
- ***Oliver's Fruit Salad*** by Vivian French
- ***The Vegetables We Eat*** by Gail Gibbons

Life under a Log

WHAT'S THE **Big Idea?**
Diversity

Materials
- magnifiers or bug boxes
- "Life under a Log: Critter ID" sheet (Appendix, p.256)
- a rotting log, large rock, or leaf pile to turn over

Enduring Understandings

- Communities are made up of living things.
- Every living thing has a special role in its community.
- Every living thing contributes to its community.
- Living things adapt differently to meet different needs.

Objectives

- Children discover what lives under a log.
- Children demonstrate an awareness of these creatures' roles in the community: making soil.
- Children demonstrate an understanding that a diversity of creatures is needed to have a successful community.
- Children develop empathy through treating other living creatures with respect.

Directions

NOTE: In the classroom, demonstrate how to roll over a log using a real log and plastic worms and spiders. Slowly roll over the log, gently brush aside leaf litter, and carefully look for worms, salamanders, and other living things. Have the children pretend to rub soil into their hands if they wish to pick up or hold a critter. Our hands have soap and other oils that are harmful to critters that breathe through their skin. When it is time to return the creatures to their log, show how to first roll the log back into place, then gently set the creatures next to the log so they can crawl back under it. If you put the creatures back first and roll the log over them, they can be crushed. After practicing with your students, do the following.

1. Ask children if they'd like to see who lives under a log (or rock, or leaf pile). While walking outdoors, find a rotting log, slab of rock, a board, or an area of thick leaf litter.
2. Before approaching, suggest to the children that they might seem like giants to the tiny creatures living under a log. Ask, "How should we behave so as not to frighten or hurt these creatures?" Encourage them to be "gentle giants."
3. Model again how to gently roll over a log and then begin to look closely at the tiny world of creatures who live there. Remind children that the creatures will try to hide as soon as the log is rolled over.
4. Before attempting to pick up any of the creatures, rub soil on the palms of your hands to cover up any soap or lotion. Don't pick up these fragile creatures if your hands have insect spray or sunscreen on them. Earthworms and amphibians, such as salamanders and

toads, breathe through their skin and will suffer from the insect spray and sunscreen. Use bug boxes or magnifiers to examine the creatures. Note the diversity of creatures. Count their legs, note their shapes, and remark on their colors.

5. Explain that slugs, ants, and beetles will eat the log. They will attract spiders, salamanders, and centipedes. Rotting logs provide homes for many critters and they are also places where our valuable soil is made. The creatures turn the rotting log into soil. Remind children to be respectful of our forest recyclers and their homes.
6. Remind children to be gentle giants when "putting the roof back on." Once the log is rolled back, gently return any salamanders or worms to the edge of the log and they will return to their home. If you put the creatures back first then roll the log over, the critters may get crushed.
7. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions. Children can also record their findings in journals.

Discussion Questions

- Who lives here?
- What are they doing?
- What else is here besides the critters?
- Are these critters a community? Why or why not?
- How is the log community like the community you live in?
- Where do you think soil comes from?
- How does soil made by creatures help people?
- How do the creatures living under a log help one another?
- What would happen if only one kind of creature lived under the log?

Extensions

- ***A Log's Life*** by Wendy Pfeffer
- ***What's Under the Log?*** by Anne Hunter
- ***A Salamander's Life*** by John Himmelman
- Make a large mural of a rotten log with windows cut out in it. Children can draw the creatures they found and place them in the log behind the flaps.
- Collect different types of soil (driveway, garden, humus), mix with water and create a painting with mud.
- With a large empty box, construct a rotting log that children can crawl into, role-playing the creatures they spotted making the soil.

Look What I Found!

WHAT'S THE **Big Idea?** **Diversity**

Materials

- empty egg cartons
- plastic or paper bags
- collage-making supplies (glue, markers, poster board, etc.)

Extensions

- Give students specific guidelines for displaying their findings. For example, they might separate findings by size, texture, or color.
- Sort findings by living and nonliving.
- Make a collage from the variety of seeds you find in your community.

Enduring Understandings

- A natural environment is healthier with a diversity of plants.
- A human environment is healthier with a diversity of people.
- Seeds and plants have different shapes and colors and thrive in different conditions, but are all seeds.
- Each plant and seed contributes to the community.
- People have different shapes and colors, strengths and talents, but are all people.
- Each person contributes to the community.

Objectives

- Children discover many different kinds of seeds and plants.
- Children experiment with seeds and found objects as an art medium.
- Children play with found objects.

Directions

1. As part of getting to know who we are, take your class on a fall walk looking for the natural diversity that occurs around the schoolyard.
2. Walk around the schoolyard or neighborhood, collecting natural objects, leaves, stones, petals, etc. If you are fortunate enough to have a school garden, have children gather seeds and plants that have gone by or that can no longer be harvested.
3. After collecting, gather together to display your findings. Have each child display his or her findings in any manner they wish on a large piece of paper.
4. Have the children partner with the person beside them to talk about their findings. Encourage good listening and good questions about why the objects are displayed the way they are.
5. After everyone has had a chance to share their findings, have them pick some of their findings to use in a nature collage. Hand out art supplies, glue, markers, and poster board to display the collage.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Why did everyone find so many different objects?
- Why is it important that there are different plants and seeds in our neighborhood?
- How does having a diversity of people in our neighborhood make our community stronger?

Plant Parts We Eat

WHAT'S THE **Big Idea?**
Diversity

Enduring Understandings

- We rely on each other and other living things to meet our needs.
- Plants have different parts. Each part has a unique role in supporting the plant.
- Different plants have different parts that are good to eat.
- A healthy diet requires diversity.

Objectives

- Children cultivate and grow some of their own food.
- Children show interest and curiosity about where their food comes from.
- Children experiment with tasting different foods.

Directions

For this experience, you and your students will need access to a garden or farm. If you are able, consider growing a garden at your school (see "School Gardening with Young Children," p.202 and "Digging In," p.204). If you lack space, you can grow vegetables in various containers.

1. As produce becomes ripe, visit the garden and show children how to harvest different types of produce, from peas in the spring to kale in the late fall. This allows children to follow the cycle of the seasons and plant growth. Invite your children to harvest and eat the produce right away. Eating straight from the plant never fails to tempt non-veggie lovers. If you are purchasing the produce, a field trip to the store gives children an opportunity to see the diversity of fresh fruits and vegetables available and the different colors, sizes, and shapes they come in. Gather and wash your harvest.
2. Offer the freshly harvested or store-bought treats to the children as you read *Tops and Bottoms* by Janet Stevens. Discuss what parts of the plants we eat when munching on carrots (root), lettuce (leaf), broccoli (flower), and tomatoes (fruit).
3. On a large cookie sheet, let children shape a plant with the harvested vegetables. Cut the carrots into thin sticks for the "roots," add celery sticks for the stem, lettuce as the leaves, and broccoli pieces as the flower. Cherry tomatoes are the fruit to eat. Afterwards, eat all the parts of that plant!
4. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Materials

- ***Tops and Bottoms*** by Janet Stevens
- carrots, celery, broccoli, lettuce, cherry tomatoes (from a garden or a store)
- cookie tray
- cutting board and knife

Extensions

- Recruit Master Gardeners, parents, grandparents, or retired folks to lend a hand in the school garden.
- Invite a farmer to your class to talk about growing food.
- Plan for your garden in the late winter. Have children cut out pictures of vegetables and fruits from seed catalogs and make a map of what they'd like in the garden.

Discussion Questions

- Where does food come from?
- What is your favorite vegetable?
- What part of the plant is your favorite vegetable?
- Can you think of any other roots/leaves/stems/seeds/fruits that we eat?
- What should we plant in our garden next year?

Who Am I? Who Are You?

WHAT'S THE **Big Idea?**
Diversity

Materials

- ***Whoever You Are*** by Mem Fox
- variety of "flesh"-colored crayons
- paper
- mirrors

Extensions

- ***Why Am I Different?*** by Norma Simon
- Try this activity on a monthly basis and have the children compile their own self-portrait books, or display in your classroom.

Enduring Understandings

- Healthy communities require diversity.
- Every living thing experiences the world differently.
- Each living thing is unique and special.

Objectives

- Children demonstrate an understanding that children all over the world share commonalities and differences.
- Children show interest and curiosity in other children.
- Children experiment with drawing a self portrait.

Directions

1. As the school year begins and you are building community, read *Whoever You Are* by Mem Fox. Talk about all the children represented in the book and the things all children have in common. Talk about differences, too, and that neither similarities or differences mean better or worse.
2. Have children talk about themselves. What do they enjoy doing? What books do they like? What are their favorite foods or animals?
3. Ask each child to draw a picture of herself or himself. Have a variety of skin-tone crayons for them to choose from. Don't correct them if they choose a color that does not match their skin color.
4. Post the pictures for all to see with a heading of "Our Class" or save the pictures and have children draw more pictures of their favorite things. Combine all the pictures into a book, one for each child. Share the books with families.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Why is it important that there are different colors in the world?
- What color words would you use to describe the color of your skin?

The Colors of Us

People have different hair, eye, and skin colors and they wear different colored clothing. When we discourage children from voicing what they notice about people, we teach them that human difference is taboo. Young children also often believe different skin colors have different values, because those messages run deep in our culture and media. But all skin, hair, and eye colors are beautiful, and none have more intrinsic value than others. The value we perceive and ascribe to skin, hair and eye color are the foundations of stereotypes and bias. It is our job as teachers to foster a constructive conversation about human difference that acknowledges and affirms the colors of all people. *The Colors of Us*, by Karen Katz is an excellent resource.

Ice Treasures

WHAT'S THE **Big Idea?**
Diversity

Enduring Understandings

- Healthy systems require diversity.
- Colors can be mixed to create a different color.

Objectives

- Children experiment with colors.
- Children understand that colors can be mixed and changed to make new colors.

Directions

With its colder temperatures and snow, winter is a great time to create "ice treasure." Even if snow does not occur in your climate, students will enjoy making ice treasures and hiding and finding them outside.

- Review the water cycle through song or story. See "The Water Cycle Dance," p.152, or read *The Water Cycle* by Helen Frost.
- Set up an experiment table where water can be poured without damaging anything. Set clear plastic cups on a tray or cookie sheet (the tray will collect any spilled water). Ask students to pour water in each cup until each is ¾ full. Let them experiment with adding drops of food coloring to the water and have them observe what happens. Ask students to predict what might happen to the original color if a second color is added. Add a second color and observe the results.
- Place your cups outside (if below freezing) or in a freezer until the water is frozen.
- Once frozen, pop the colored ice out of the containers (this will stain fingers), and take the treasures outside to hide in the snow or grass. Set your students loose to find them, or invent other ways to play with the treasures.
- Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What colors of food coloring did we use? How many different colors did we start with?
- How many different colors are in our ice treasures? How many colors did we start with? How did we get more colors?
- Are colors always just red or just blue?
- What do you predict will happen to the ice treasures if we leave them outside?

Materials

- ***The Water Cycle*** by Helen Frost
- clear plastic cups
- food coloring
- water

Extensions

- ***One Red Dot*** by David A. Carter
- ***Blue 2*** by David A. Carter
- Using old ice trays instead of clear plastic cups, freeze the colored water and put the ice cubes in your water table with snow or water. If you put them in water, ask children to predict what will happen to the ice treasures.
- Continue to experiment with color variations using finger paint or water colors. Discuss findings. Any surprising results?

Stone Soup

WHAT'S THE **Big Idea?**
Fairness
Equity

Materials

- ***Stone Soup*** by Heather Forest (We love this global version of this classic story but any version will do. You might even consider reading more than one version and comparing them.)
- ingredients and equipment to make stone soup (Most versions of the book include a recipe, or you can use our recipe on the next page.)

Enduring Understandings

- Resources need to be shared to meet the needs of living things.
- When people work together, they can get more done.
- When we share, everyone can get what they need.

Objectives

- Children show interest and curiosity in cooking.
- Children discover the joy of cooking and sharing a meal with others.

Directions

1. Read *Stone Soup* by Heather Forest. Discuss the story, and how sharing helped everyone get what they needed.
2. Tell the students that you will now make a stone soup! You can follow the soup recipe in the book or use our version on the facing page. You can consider asking children to bring in one vegetable from home if that is possible for families, or have a variety of vegetables available in your classroom and allow each child to pick one to add to the soup pot.
3. Discuss proper hygiene when cooking. (See "Bread, Good Bread" in *How are We Connected*, p.196 and "Tips on Cooking with Children," in Appendix, p.258). Have children wash their contribution to the soup and cut it into bite-sized pieces.
4. Invite families, another class, or community members to share in eating your stone soup. If there is an organization in your community that provides meals to the hungry, find out if they would serve soup made off the premises and bring the soup to be served there.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Students cut their contributions to the stone soup into bite-sized pieces.

Discussion Questions

- In the book, why did the people in the town not share the food they had?
- Would you have shared your food if you had lived in the town?
- How did it feel to share the soup you made?
- Why is it important to share food?
- How do you feel when someone shares something with you?
- What else could we do that would be better if we did it all together?

Shelburne Farms Stone Soup

This recipe makes 36 four-ounce servings of soup.

INGREDIENTS

2 qts. water
1 qt. peeled tomatoe with juice
1 qt. vegetable broth
1 clean stone
6–8 c. total of a variety of vegetables, chopped into bite-sized pieces (any combination of what's available will do)
- carrots
- onions
- potatoes
- green beans
- corn
- peas
- beets
- mushrooms

herbs for flavor: basil, dill, marjoram, thyme
¼ c. pasta
¼ tsp. pepper
1 tbsp. salt

INSTRUCTIONS

1. Bring water, broth, and tomato juice to a boil.
2. Add stone, and slow-cooking vegetables (such as onions, potatoes, carrots, beets), and simmer for 25 minutes.
3. Add vegetables that cook more quickly (such as peas, corn and beans) and simmer for 15 more minutes.
4. Add pasta and cook for 7 minutes.
5. Season to taste with salt, pepper, and herbs.
6. Share and enjoy the soup.

Extension

- On a felt board, put felt cutouts of various vegetables and characters from the story. Children can retell the story using the felt cutouts.

Feeding the Birds

WHAT'S THE **Big Idea?**
Fairness

Materials

- pine cones of all sizes
- birdseed
- Crisco or peanut butter
- cheerios cereal
- string

Enduring Understandings

- Healthy communities and systems require diversity.
- Everyone needs to share resources with other living things.
- Every living thing needs help from others sometimes.
- Every living thing can help others.
- We all contribute to our communities.

Objectives

- Children demonstrate an understanding that sharing resources makes a healthier community, because sharing allows everyone to get what they need.
- Children show interest and curiosity about others in their community.
- Children discover the importance and joy of helping others in their community.

Directions

1. As part of a discussion on what all living things need, guide the talk to wild animals that live in the school neighborhood. Discuss ways the children could share what they have with animals.
2. Ask families or community members who may have Christmas trees to donate them after the holiday for the schoolyard. Set the trees up as near to your classroom windows as you can so that students can observe the animals that come to eat from the trees.
3. If there are no allergies in your classroom, have children coat pine cones in peanut butter. Otherwise, use crisco. Roll the coated pine cones in birdseed and tie a string to each cone. String cheerios as garland.
4. Take pine cones and garland outside and hang on the trees. Observe what animals eat these winter foods. Keep a record of which animals visit and what they prefer to eat.
5. Discuss why some animals need people to share food with them in winter and the importance of keeping food available throughout the winter as the animals will become dependent on this food source.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What animals were you surprised to see eating your birdseed and cheerios?
- What did you notice about the animals and how they ate, moved, or behaved?
- What other ways could our class share resources with all members of our community?

Extensions

- Discuss other needs of your community. Include children in brainstorming who might need help and how we can ask, and find, what they need.
- Stage a clothing drive for your school. Ask for donations of usable winter clothes from staff, families, and other organizations. Have children sort clothing, set up tables with clothes and provide refreshments for their "shoppers."

The Fabulous 5

WHAT'S THE **Big Idea?**
Interdependence
Cycles

Enduring Understandings

- All living things (including the food we eat) have needs.
- Plants need a balance of sun, water, air, space, and soil to grow successfully.
- We rely on each other and other living things to meet our needs.
- We need food to live.
- Our food comes from the land.

Objectives

- Children demonstrate problem-solving by following clues in a scavenger hunt.
- Children cultivate an awareness of the five things a plant needs to survive.
- Children show interest and curiosity in what a plant needs to grow.
- Children build awareness of what living things need to survive.

Directions

1. Before the actual lesson, find time to place the clues around your schoolyard, garden, or even classroom. Ideally, it would be outside.
2. Show the children a handful of bean seeds. Ask the children, "What do you think bean (and other types of) plants might need to grow and live?" Once they have shared some of their ideas, have a "seed" invite the children to go on a scavenger hunt to discover what it needs to grow into a plant! (Read Clue 1.) Tell students that along the way they will be make a bracelet to help them remember what plants need to live.
3. As you visit each station, identify the visual clue that represents one of the "Fab 5": a picture of a sun, water or a spigot, a pinwheel, a bucket with soil, and a picture of plants nicely spaced. At the first station, distribute the pipe cleaners and the first bead. At each of the following stations, help children add a bead to their pipe cleaners. It can be helpful to review what each bead represents each time they add a new one. (Black beads = the seed; yellow beads = the sun,

Materials:

- a pipe cleaner for each child
- baggie with bean seeds

Sun Station:
- baggie of yellow beads*
- an image of a sun
- clue card *(see p.77)*

Water Station:
- baggie of blue beads*
- jar of water, image of spigot
- clue card *(see p.77)*

Air Station:
- baggie of clear beads*
- a pinwheel
- clue card *(see p.77)*

Space Station:
- baggie of green beeds*
- a picture of plants nicely spaced in a row
- clue card *(see p.77)*

Soil Station:
- baggie of brown beads*
- bucket (or picture) of soil
- clue card *(see p.77)*

**Include enough beads for each child.*

Extensions

- Using the "Bean Life Cycle Cards" (Appendix, p.___), have children place the cards into the correct order.
- Plant some bean seeds in the garden or a container. Eliminate one of the "Fab 5" and see if the plant will still grow.
- Soak lima bean seeds in water for a few hours, then have children dissect a bean to discover the tiny bean plant asleep inside. Try this with other types of seeds and compare your findings.
- Save some dried bean plants and beans from the garden, then have children remove the bean pods and shuck the bean seeds out of the pods. Compare the seeds. What can you do with these beans? Eat them, plant them, or use them in a seed mosaic.
- ***Who Is in the Garden?*** By Vera Rosenberry
- ***How Groundhog's Garden Grew*** by Lynne Cherry
- ***The Carrot Seed*** by Ruth Krauss
- ***Tops and Bottoms*** by Janet Stevens
- ***The Ugly Vegetables*** by Grace Lin

blue beads = water; clear beads = air; brown beads = soil; green beads = the space the plants need to grow.

4. At the last station (soil), make sure to have a spot to plant the bean seeds. Encourage your students to observe if the seeds will grow into a plant that will have all of the "Fab 5"!
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Do you know any other living things that need the same things that a seed needs to grow?
- Where does the plant get the "Fab 5"?
- What do you think would happen to a plant if it didn't have all of the "Fab 5"?
- What do people need to live?
- Where do people get the things they need to survive?

Seed

Clue 1

In order for me to grow big and strong,
You are going to need to help me along.
Five things I need to stay alive—
We'll call them the **fabulous five!**
The first will surely help me wake.
It's cold in here for goodness sake!
I must warm up and feel the light—
Take me where it's warm and bright.

Sun

Clue 2

I'm much warmer now, thanks a bunch,
But I think it's getting time to munch.
I make my own food whenever I'm hungry,
But the problem is, I'm really *thirsty*!

Look around—you need to think,
and find something for plants to drink.

Water

Clue 3

You need me and I need you!
Soon you'll learn a step or two
We eat and drink and need to share,
'Cause both of us must breathe the
_____.

Look around—think and observe.
Can you see where wind is pushing air?

Air

Clue 4

Even though I'm little now
I'll soon enough be big—somehow.
I'll grow with others (it's not a race)
Just don't plant me too close,
I need my _____.

Look around! You'll see a sign,
showing plants with room, growing fine.

Space

Clue 5

Sun, water, air, and space—
are things I need to grow.
But there's one more thing I need, you know.
It's dark and brown, under your feet.
Without it my life will be incomplete!
Look around—a bucket and a sign—
complete the 'Fab Five' and your plants will grow fine!

Soil

The Fab 5!

Sun
Water
Air
Space
Soil

Plant your seeds!

Dress up a Bean Plant

WHAT'S THE **Big Idea?**
Cycles

Materials

- straws tied to a string
- two large green cloth or paper leaves
- large white cloth or paper petals made into a necklace
- several large green paper string beans
- bee puppets

Enduring Understandings

- All plants have similar parts: roots, stems, leaves, flower, fruit or vegetables and all produce seeds.
- Each part of a plant has a unique role in supporting the plant.

Objectives

- Children discover the parts of a plant.
- Children role-play plants by dressing up as plants.

Directions

1. Fill your class with various plants, flowers, or vegetables for the children to observe. On outdoor walks, observe plants around your school: grass, trees, weeds, or whatever is growing. Begin a conversation about plants by asking children what they see, feel, and smell about these plants. What do they notice is similar among the various plants? What is different? Can they identify some "parts" of a plant?
2. Ask for a volunteer who would like to be turned into a bean plant.
3. Building on the students' observations of the plants, ask for suggestions about what this child needs to be turned into a plant. Leaves, roots, and a stem might be a few suggestions.
4. Tie straws that have been attached to string around the volunteer's ankles to represent the **roots** that stabilize the plant and suck up moisture from the soil. The child's legs will represent the plant's **stem**, which moves food and nutrients throughout the plant as it stabilizes the plant.
5. Place two green cloth or paper leaves over the child's arms. These represent the first two true **leaves** of a young plant.
6. The volunteer's head makes a perfect **stigma**, the center of a flower, and a necklace of large white cloth or paper petals can be placed around the child's neck to complete the plant's **flower**.

7. Explain that the flower needs to be pollinated to produce a bean. Have another child approach the volunteer's flower with a "flying" bee puppet. After pollination, the flower falls off and behold, beans!
8. Tell children that as the bean grows, it develops seeds. These seeds can be eaten or saved for planting next spring!
9. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What are the different parts of plants?
- What do the different plant parts do?
- How do other plants grow?
- Where can you find seeds in other plants?

Extensions

- ***The Big Yellow Sunflower*** by Frances Barry
- ***Jack's Garden*** by Henry Cole

Posy Poetry

WHAT'S THE **Big Idea?**
Diversity

Enduring Understandings

- Diversity of plants makes an environment healthier.
- Plants have flowers of different size shape and color to help them survive.

Objectives

- Children show interest and curiosity about flowers, buildings, or animals.
- Children experiment with words to describe flowers, buildings, or animals.

Materials

- 4–7 different flowers, buildings, or animals (either photos or the real things)
- scraps of paper for each child
- pencils for each child
- an envelope at each object/photo
- large pieces of paper on which to write the finished poems
- ***It's Raining Pigs and Noodles*** or ***A Pizza the Size of the Sun*** by Jack Prelutsky

Directions

1. Read a poem such as any from Jack Prelutsky's *It's Raining Pigs and Noodles* or *A Pizza the Size of the Sun* to inspire your class.
2. Explain to your students that it is their turn to become poets. They will work alone and then with a group to create a poem about flowers or buildings or an animal.
3. Point out the objects you have chosen to be written about. Every child should visit each one and on scraps of paper, write two to three words to describe the object. The words could describe how the object makes them feel or what it reminds them of. Once they have written their words, they should put their slips of paper into the envelope and move on to the next object.
4. When all the envelopes are full, gather them up and shuffle them, then divide your class into groups, one for each envelope. Give each group an envelope (they shouldn't know which object is being described inside).
5. Each group then lays out their scraps of paper and begins to arrange them to make a poem. They must use every slip of paper and may add a few connecting words such as "and" or "the."
6. Have each group write its poem on a large sheet of paper and prepare to present it to the other children.
7. Once all the groups have completed all the tasks, pull everyone together for a poetry reading. Each group presents its poem, then the rest of the children try to identify the object the poem described.
8. Post poems around the room and share with other classes and families.
9. Encourage budding poets to write on their own. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Extensions

- If children cannot write or feel insecure about writing their descriptions, have an adult at each object to write what each child says. The adults can also ask questions to prompt language development.
- For 3–5 year olds, this activity may be done in a big group. Children can call out descriptive words and the teacher can write them on individual pieces of paper. The teacher then reads each word aloud and the children guess which object is being described.
- Posy Poetry can become "Tractor Poetry" or "Tree Poetry." Use your imagination to help children look at all sorts of objects with a poetic eye.

Discussion Questions

- What did it feel like to write a poem together?
- Can you think of other things we could write poems about?

Eating the Rainbow

WHAT'S THE **Big Idea?**
Diversity

Enduring Understandings

- We rely on each other and other living things to meet our needs.
- Food comes from nature: from plants and animals.
- Plant food comes in many colors and with many different benefits for our body.
- Eating a variety of colors of food leads to a healthier body.

Objectives

- Children show interest and curiosity about tasting different foods.
- Children discover that the color of a food can indicate how it helps our body.
- Children experiment with tasting different fruits and vegetables.

Materials

- ***Eating the Rainbow: Fruits & Vegetables from A to Z*** by Lois Ehlert
- variety of different colored fruits and vegetables
- child-sized vegetable cutting implements
- five plates
- a label for each color to indicate how this color fruit or vegetable helps our body (see box below)
- beads to represent the colors of the rainbow (one of each color per child)
- string or pipe cleaners on which to string the beads

Directions

1. Read *Eating the Rainbow: Fruits & Vegetables From A to Z* by Lois Ehlert.
2. Discuss how important it is for our health to eat foods that are a variety of colors. Talk about how boring things might be if we only saw white and no colors. If we ate only white foods, it would probably get boring, and it would not be best for the health of our bodies. The more colors in the food that we eat, the better it is for our bodies. Ask your students if they would be interested in trying a taste of a fruit and vegetable "rainbow" and finding out how different colored produce can help us be healthy.
3. Gather a variety of multi-colored fruits and vegetables, either from a garden or from a grocery store or farmer's market. Have children wash and cut the produce into bite-sized pieces.
4. Sort the fruit and vegetable pieces onto five plates by color: red, yellow/orange, green, blue/purple, and white/brown. Place a label next to each plate to indicate how fruits and vegetables of this color help our bodies (see box).
5. Invite the children to taste fruits and vegetables from each plate. As they taste a sample, have them indicate their preference with a smile or frown face. After the children have tasted and recorded a color group, give each child a bead of that color to add to a pipe cleaner or string.

Fruit & Vegetable

Colors for Your Health

Fruits and vegetables *that are the colors below generally benefit specific areas of the body.*

- **red:** heart, head (memory)
- **yellow/orange:** heart, eyes, immune system
- **green:** eyes, bones, teeth
- **blue/purple:** head (memory)
- **white/brown:** heart

When they have tasted every color, they will have a rainbow bracelet to remind them to "eat the rainbow."

6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions. Whenever your students are eating, remind them to check out the colors in their lunch or on their plate. Do they have a rainbow to eat?

Discussion Questions

- What is your favorite color? Can you name some fruits or vegetables that are that color?
- What is your favorite fruit or vegetable? What color is it?
- Can you think of a way to help others remember what each color does for our body? Can you think of a song? A rhyme?

Extensions

- After a harvest in the garden or by using store bought fruits and vegetables, work together to make one big rainbow to eat.
- Create a paper rainbow on a large sheet of white paper. Instead of coloring each arc of the rainbow, draw or paste pictures from seed catalogs of fruits and vegetables.
- Create a paper rainbow on a large sheet of white paper. Have students track the colors they eat in their snacks by adding that color to the rainbow using dot paints.
- Before cutting fruits and vegetables, arrange them in settings and have the children draw still life pictures.

Who Lives Here?

Who Lives Here? introduces children to the people, plants, and animals of their place. By asking and exploring the question, "Who lives here?" children discover how our human, natural, and agricultural communities are interdependent. Children will develop a strong understanding and sense of community and place, as well as begin to grasp how they are interdependent—no matter where they live.

WHAT'S THE **Big Idea?**

Community: A group of living and nonliving things sharing a common purpose or space.

Interdependence: All living things are connected. Every organism, system, and place depends on others.

Enduring Understandings

- There are different kinds of communities.
- Each living thing is part of a community/multiple communities.
- Each person shapes and is shaped by his or her community.
- Community is an outcome of relationships.
- Every living thing has a unique role, or niche, in its community.
- What we do impacts the human/natural world around us.
- We rely on living organisms and nonliving things in our human and natural worlds to be healthy, safe, and happy.
- Members of a community depend on each other.

Connecting beyond the Classroom

Family Connections

Communicate with families by sending a letter home, creating a website, or hosting an open house that introduces the Thread, Essential Question, Big Ideas, and Enduring Understandings. Invite families to use this language at home with students to facilitate the transference of children's learning. Ask families if anyone has any resources or expertise to share, such as a bird nest collection, knowledge about animals in the community, or a role as a community helper. Host an event where children can share their learning during the Thread, and offer families a chance to participate in the Facilitated Learning Experiences with their

Dear Families,

We are so excited to be embarking on an exploration of **Who Lives Here?**

We wanted to share our plans with you so that you might discuss what we are learning with your child. For this study, the question "Who Lives Here?" will guide us as we explore:

- The people, plants, and animals that live here
- Our human, natural, and agricultural communities, and how our communities are interdependent
- The various roles and functions that people, plants, and animals play in our communities

Our goal is to help your child develop a strong understanding and sense of **community** and place, as well as the **interdependence** of living things. They'll understand the following:

- There are different kinds of communities.
- Each living thing is part of a community/multiple communities.
- Each person shapes and is shaped by his or her community.
- Community is an outcome of relationships.
- Every living thing has a unique role, or niche, in their community.
- What we do impacts the human/natural world around us.
- We rely on living organisms and nonliving things in our human and natural worlds to be healthy, safe, and happy.
- Members of a community depend on each other.

If you have any resources or expertise to share, such as a bird nest collection, knowledge about animals in the community, or a role as a community helper, please let us know so that we can find a way for you to come and share.

Thank you!

WHAT'S the "BIG IDEA?"

Community: A group of living and nonliving things sharing a common purpose or space.

Interdependence: All living things are connected. Every organism, system, and place depends on others.

children. Or, have the children prepare an experience for their families, such as mapping their neighborhood and using the map to take their families on a tour of "Our Community."

Service-learning Opportunities

There are many ways that children can deepen their learning through service-learning and become community helpers themselves. By embedding learning in children's attempts to meet community needs, students come away with better content understanding, more meaningful social and emotional skills, and an understanding of their ability to create change. Children can build homes for wild animals in their community, tend a community garden, or serve a meal to the community, all of which become rich opportunities for exploring things like what animals need to survive, what plants need to thrive, and what it takes to put together a meal. They can also cultivate social and emotional skills through developing friendships and teamwork with their peers. Help make these skills explicit to children. Based on your curriculum, brainstorm with children ways in which they can contribute to the community, and use their ideas to plan a project together.

Community Connections

Service-learning opportunities provide one way to connect to the larger community. Meeting members of the community (see "Community Helpers: Who Helps," p.116), learning about their roles and how they help the community, can deepen children's understanding about how members of a community depend on one another. *Who Lives Here?* is also a prime opportunity to work with children to understand who they are as individuals, who their peers are, and to establish their own community in the classroom. Explicit teaching of social skills is important to help students understand and practice the behaviors and attitudes they need to be successful members of a community.

Self-guided Opportunities

Loose Parts

The Loose Parts for *Who Lives Here?* can include both natural and human-made materials, located both inside the classroom and outside. Blocks (rustic and manufactured) provide rich opportunities for exploration. Children can use cardboard boxes in a variety of sizes to create everything from animal homes to dramatic play. Animal skeletons, simulated scat (coffee beans to represent deer scat, cocoa puffs to represent rabbit scat), real birds' nests, plants, logs, stumps, leaves, clay, and other treasures from nature also

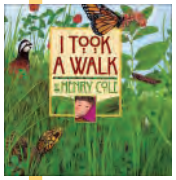
Campers create a castle from loose parts: tree stumps and sticks.

lend themselves to free play. Encourage children to add to the Loose Parts collection as they discover treasures on their adventures.

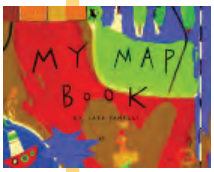
Dramatic Play

Props for dramatic play for *Who Lives Here?* should include both human and natural artifacts. Include home-keeping sets, like a play kitchen, as well as sets that represent community locations (fire station, post office, bakery, restaurant, etc.). Props that allow for role-playing of animals in their homes could include a log with holes, toilet paper rolls covered in socks to represent a life-sized mouse home, shoeboxes with different-sized holes to host a variety of animal friends. A child's wading pool can be filled with leaves, or a sheet (to represent snow). Animal puppets, rubber critters, and stuffed animals can also serve as great props for imaginative play. Encourage children to role-play members of the community: everything from squirrels, to flowers, to police officers. Help students talk through the narrative for their role-playing to allow them to develop deeper,

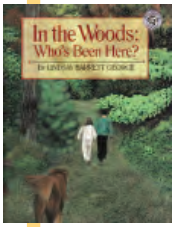
Linda's Picks *for* WHO LIVES HERE?



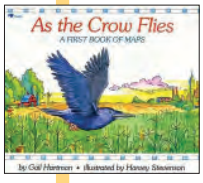
I Took A Walk by Henry Cole. *Greenwillow Books, NY, NY, 1998.*



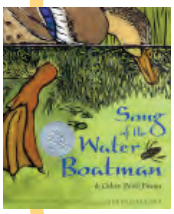
My Map Book by Sara Fanelli. *Walker Children's Paperback, London, UK, 2007.*



In the Woods: Who's Been Here? by Lindsay Barrett George. *Mulberry Books, NY, NY 1998.*

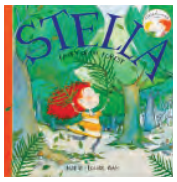


As the Crow Flies: A First Book of Maps by Gail Hartman. *Aladdin, NY, NY. 1993.*



Song of the Water Boatman and Other Pond Poems by Joyce Sidman. *Houghton Mifflin, Boston, MA 2005.*

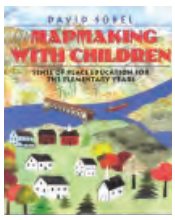
Near One Cattail: Turtles, Logs and Leaping Frogs by Anthony D. Fredericks. *Dawn Publications, Nevada City, CA 2005.*



Stella Fairy of the Forest by Marie-Louise Gay. *Groundwood Books, Toronto, Canada 2010.*

The Salamander Room by Anne Mazer. *Dragonfly Books, NY, NY, 1991.*

The Very Best Bed by Rebekah Raye. *Tilbury House Publishers, Gardiner, ME, 2006.*



Mapmaking with Children by David Sobel. *Heinmann, Portsmouth, NH, 1998.*

for educators

extended scenarios for imaginative play. Create a model of the community in the classroom (with blocks or boxes), or take the children out into the human and natural communities nearby to engage in role-playing.

Children can begin to learn numeracy skills by sorting a variety of objects. Here, they sorted firewood by size.

Outdoor Play

At any time when outdoors, encourage the children to ask questions and follow their curiosity. Provide tools; such as, magnifying glasses, binoculars (pretend or real), bug boxes, and nets to allow children to investigate "who lives here?" Offer journals as a quieter way for children to engage outdoors. Journaling is an excellent way to integrate literacy development into outdoor play through drawing and writing observations and narratives. Encourage physical movement that imitates the walking, running, waddling, flying, hopping, etc., of animals and people that live here.

Art

Provide a variety of natural and recycled materials for students to work with; such as, twigs, leaves, pine needles, nuts, seeds, clay, maps, egg cartons, paste, paint, markers, cardboard boxes of all sizes. Encourage children to create props for role-playing in animal or people homes. Offer materials for students to make contributions to the Learning Wall, where they can independently record their observations and discoveries. As children show interest in art, help them expand their ideas—their creations can be both made of things that live here, as well as for those who live here.

Numeracy

Who Lives Here? provides many opportunities for children to practice their numeracy skills. Children can count, sort, classify, graph, tally a variety of objects found in the community; such as, nuts, seeds, sticks, animal homes, and plants. During play, encourage the use of positional words to describe movement: under, through, around, over, etc. Encourage children to go on scavenger hunts for shapes. Practice estimating by guessing what size of holes different animals need to enter their homes. Search for numbers during neighborhood walks: house numbers, signs, license plates, anywhere!

Explore Table

Set up a place in the classroom where children can investigate anything that captures their curiosity. Include artifacts such as twigs, rocks, soil, plant specimens, owl pellets, and nests. Children can use identification guides and books to build literacy skills. Magnifying glasses and boxes allow closer inspection. Encourage children to contribute items to the Explore Table. Students can use soil or water at the Explore Table.

Who Lives Here?

WHAT'S THE **Big Idea?**

Interdependence
Community

Facilitated Learning Experiences:

KEY: Community • Food & Farming • Nature

EVERY SEASON

Animal Homes 91
Animal Charades 93
Handful of Sounds 94
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Docu-Walk: Who Lives Here? 97

FALL

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SUMMER

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Animal Homes

WHAT'S THE **Big Idea?**

Interdependence
Community

Enduring Understandings

- Animals need shelter to survive.
- Animal shelters differ depending on the animal and habitat.
- Animal homes may change depending on the season.

Child role playing an otter sliding in the snow

Objectives

- Children demonstrate an understanding of what makes a good shelter for an animal.
- Children show interest and curiosity in looking for various animal homes in the wild.
- Children experiment with building animal shelters.
- Children engage in play as a means to understand various types of animal homes.

Directions

1. Prior to the children's arrival, set up your classroom as an outdoor habitat. Bring in small tree saplings to attach to the walls, hang the empty birds nests and squirrel dreys in the trees. Create a fox den, mouse tunnels, and bear caves throughout the room.
2. Read the books *Who Lives Here?* by Maggie Silver or *In the Woods: Who's Been Here?* by Lindsay Barrett George. Then begin a discussion to determine what your students know about local wild animal homes.
3. Encourage children to role-play local wild animals using the animal homes and puppets set up in the classroom.
4. Go outside for an "animal home hunt." Children can use the "Animal Homes" sheet as a reference while looking for animal homes. Before setting out, establish a quiet signal to alert others to something interesting a child may find. A quiet owl "hoot" or clicking sound

Materials

- ***In the Woods: Who's Been Here?*** by Lindsay Barrett George
- ***Who Lives Here?*** by Maggie Silver
- wild animal puppets or stuffed wild animals (find puppets at thrift shops, garage sales, or solicit donations from older children. You can purchase new puppets at: folkmanis.com)
- "Animal Homes" sheet (Appendix, p.219)

Create simulated animal homes around your classroom:

- **fox den:** shoebox with 7" hole cut in, painted brown and covered in dead leaves
- **squirrel drey:** paper grocery bag curled up to form a small nest and covered with dead leaves
- recovered **birds nests**
- **mouse and vole holes:** toilet paper rolls covered in white socks
- **bear or coyote dens:** large boxes
- **child-sized nest for role-play:** small wading pool filled with dead leaves, twigs
- **child-sized mice and vole tunnels:** play tunnels

Extensions

- Make a map of the area you explored and mark any homes or other sightings that were found.

continued

can be used to quiet everyone and alert them to the find. As the class hikes through the schoolyard, stand of trees, meadow, or woods, look for any possible animal homes and signs that animals have been there, including footprints, scat (fecal waste), and evidence of food being eaten.

5. When you return to the classroom, discuss what you discovered. Use the discussion questions below to process the experience with children. Children can also record through words or drawings what they found.

Discussion Questions

- Why aren't all animal homes the same?
- How would you build a home in the wild?

- Modify the indoor animal habitat to reflect what was found outdoors, or whatever student imaginations can create. Have plenty of materials ready so they can create animal homes.
- Hand out a different Animal Home card to each child. Have them keep their "owl eyes" open as they search for their homes. When a child finds her home, let the other children know.
- Following animal role-play, write class stories about the "animals" that "live" in your classroom.
- Have your students make animal homes in whatever habitat you are exploring.
- Make individual binoculars by stapling two toilet paper rolls together, adding yarn for a necklace and having children decorate the tubes. These do not magnify objects but they will help children to focus as they search for animal homes.

- Create a water habitat by using a wading pool with paper lily pads, cattails, plastic frogs, and dragonfly puppets. No need for water, just imagination!
- Transform your classroom into a winter habitat. See "Signs in the Snow," p.106.

Read these books to explore a variety of habitats and the animals that make their homes in these habitats:

- ***What's Under the Log?*** by Anne Hunter
- ***Around the Pond: Who's Been Here?*** by Lindsay Barrett George
- ***In the Tall, Tall Grass*** by Denise Fleming

Animal Charades

WHAT'S THE **Big Idea?**

Interdependence
Community

Enduring Understandings

- All animals have certain characteristics, such as how they walk, what they eat, and how they behave.
- Humans and animals are each unique.
- Observing and learning about animal characteristics can help us better understand them, and how we are all part of a community.

Objectives

- Children demonstrate how animals walk and act.
- Children show interest and curiosity about learning various animal characteristics.
- Children role-play being a variety of animals both tame and wild.
- Children discover commonalities between animals as they observe, learn about, and role-play being animals.

Directions

Indoor or outdoors, encourage children to pick a favorite animal, wild or tame. Ask them to think about what they have observed, read, or learned about that animal and its characteristics. Once they are in "character" let the play begin! Encourage these animal charades at free choice time or recess.

Discussion Questions

- How did the animals interact? How is this interaction like real animal interactions? How is it different?
- Tell the "story" of what happened to the animal you were portraying.
- What surprised you about how an animal acted?

Materials

None

Extensions

- ***In the Woods: Who's Been Here?*** by Lindsay Barrett George
- ***In the Snow: Who's Been Here?*** by Lindsay Barrett George
- Record children's animal story in pictures and words.
- Record animal charades in action with a video camera. Share the recording with the class to discuss animal characteristics and behaviors.
- Have children role-play animal actions based on what they have seen in the wild.

Handful of Sounds

WHAT'S THE **Big Idea?**
Community

Enduring Understanding

- Communities are made up of the people, animals, and plants that live in them.

Objectives

- Children demonstrate an awareness of the living things around them.
- Children show interest and curiosity in discovering the sounds of living things.
- Children cultivate the ability to use their sense of hearing as an observation skill.

Materials
None

Extension
You can adapt this walking activity to be a quiet, seated one. Have children find a spot in the woods, field, or school yard. Once they find a spot, have them sit quietly with a clipboard or sheet of paper. As they hear a sound, have them draw a mark or picture of what they heard. After an appropriate time, call the group together to share what they heard.

Directions

1. While walking outdoors, ask, "Who might live here?" Explain that we can use our ears to try to answer this question.
2. Have all the children raise a hand with their fists closed, and be as silent as they can.
3. The children walk single file from a starting point to an ending spot. Each time a child hears a different sound, the child should raise one finger. Continue to listen for sounds until all the children's fingers are up.
4. At the end of the quiet time (usually only a few minutes), have the children share the variety of sounds they heard and guess who made each sound.
5. Process the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Who lives here?
- How do we know who lives here?
- Who else might live here?
- Why do you think _____ lives here?
- Who and what are the members of this community?
- What sounds were from the natural world? The built world?

Docu-Walk: Our School Neighborhood

WHAT'S THE **Big Idea?**
Interdependence
Community

Enduring Understandings

- A neighborhood is a geographic place in a town or city made up of people and buildings, streets and parks, and animals, tame and wild.
- Neighborhoods have differences and similarities.
- The living things in a neighborhood form a community.
- Members of a community depend on each other.

Materials

- digital camera(s)
- a large, handmade map of the school neighborhood that includes only streets and a picture of the school glued to the appropriate location
- blocks, cars, trucks, people, and animal toys
- paper and art supplies for making neighborhood building, cars, trucks, plants, and animals

Objectives

- Children demonstrate an awareness of who and what is in their school neighborhood.
- Children cultivate a sense of direction.
- Children show interest and curiosity in interesting aspects of the school neighborhood and how to place these spots on a map.
- Children discover that maps can help you locate places in the neighborhood.
- Children using blocks, sticks, and other materials create and play with neighborhoods.

Directions

It can be helpful for children to develop their "owl eyes" (see *What's Happening?* p.131) prior to beginning "Docu-Walks." Also consider doing the "Where Do I Live?" (p.101) prior to this experience.

1. Invite the class to come on a school neighborhood walk. Before going on the walk, ask them what they expect to see. Record their responses. Talk about which of these objects or people they may actually see. Build on their previous walks to confirm if it is likely they will see these things.
2. Invite the children to look at the map of the school neighborhood. Ask what they notice about the map: except for the school and street, the map is empty. Their job as they walk and observe will be to find interesting buildings or objects to put on their school neighborhood map. When they see something interesting, one of the teachers will take a photo of it (if students are adept at taking pictures, give them this task).

Typically, a **neighborhood** refers to a defined geographic location within a city or town, where residents live and often have access to goods and services. A **community** refers to a group of people with something in common, which may be the neighborhood they share, or other characteristics, such a cultural heritage, shared language, or self-identification as part of a group. In the natural world, we refer to communities as groups of living things that share a physical space and are connected to one another through a series of interdependent relationships.

Place photos of what you've seen in the right location on your neighborhood map.

3. As you prepare for the walk, ask the class to talk about what it will look like to safely go for this walk. Depending on the age of your students, it is best to have taken short walks around your school prior to this activity. Build children's capacity by extending the length of your group walks, and clearly establish what it looks and feels like to safely walk in the school neighborhood. (See p.26 to read about how one childcare center builds children's capacity for outings.)
4. Start the walk, taking pictures as you go. Stop as needed to look and discuss what you encounter.
5. On returning to the classroom, gather the children to look at the list generated before the walk. Did the class see what they expected? Add anything they saw that wasn't on the list.
6. Continue to process the experience using the discussion questions.
7. In the following days, make three prints of each of the photos that were taken and laminate them. Play a matching game with pairs of prints by placing them face up or face down (like Concentration) and have students find the matches. With the third photo, gather around the school neighborhood map to have students place the photo on the correct location. Label the photo.

Discussion Questions

- What is our neighborhood made of?
- What is a map?
- How is our map related to our neighborhood?

Extensions

- Repeat the walk, taking different routes each time.
- Hike through your school neighborhood throughout the year documenting seasonal changes.
- Invite children to add their homes to the school neighborhood map.
- Add changes to the map throughout the year; leafless trees, snow in the winter, flowers in the spring, buildings being built or torn down, etc.
- Write directions to different locations on the map.
- As you tour your neighborhood, play "Owl Eyes" (see *What's Happening?* p.131) or "Color Search" (see *Who Are We*? p.57).
- ***My Map Book*** by Sara Fanelli
- ***As the Crow Flies: A First Book Of Maps*** by Gail Hartman
- For teachers: ***Mapmaking with Children*** by David Sobel


Use duplicates of your community photos to play a matching game.

Docu-Walk:
Who Lives Here?

WHAT'S THE **Big Idea?**

Interdependence
Community

Enduring Understandings

- A neighborhood is a geographic place in a town or city made up of people and buildings, streets and parks, and both tame and wild animals.
- Neighborhoods have differences and similarities.
- The living things in a neighborhood form a community.
- Members of a community depend on each other.

Materials

- digital camera(s)
- a large, handmade map of the school and neighborhood community that includes only streets and a picture of the school glued to the appropriate location

Objectives

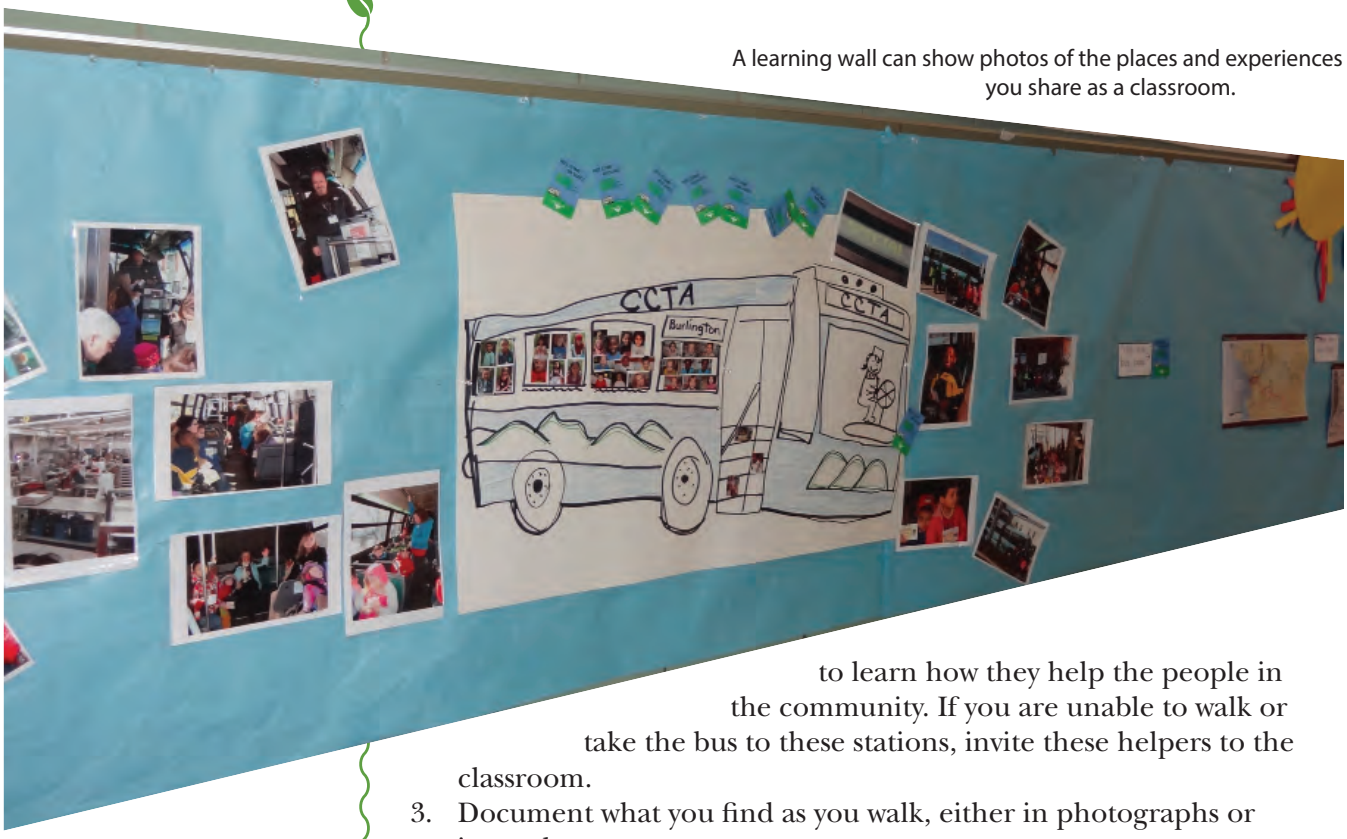
- Children demonstrate an awareness of who is in their school and neighborhood community.
- Children show interest and curiosity in the people and animals that make up their neighborhood community.
- Children discover how the people in their community work together to make it a safe and good/healthy/happy place in which to live.

Directions

As a regular part of your year-long curriculum, neighborhood walks will enable your students to meet and learn about the responsibilities of many of their school and neighborhood community helpers. It can be helpful for children to develop their "owl eyes" (see "Owl Eyes," in *What's Happening?* p.131) prior to beginning docu-walks.

1. Look at the map of your community with children. Ask them to think of places in the community. Can they find these places on the map? Tell the children you are going on a walk to explore the people, places, and animals that make up your community.
2. Venture out on your walk. Reinforce good safety practices as children visit various locations in their neighborhood community. If possible, walk to the local fire and police stations. Meet with these community helpers

Students meet with a local bus service driver.



A learning wall can show photos of the places and experiences you share as a classroom.

to learn how they help the people in the community. If you are unable to walk or take the bus to these stations, invite these helpers to the classroom.

3. Document what you find as you walk, either in photographs or journals.
4. When you return to the classroom, add pictures taken or drawn by the children to your learning wall. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Who makes up our human and natural community?
- How do these human community members help make our community a better place to live?
- What animals stay visible in your community all year? Why do these animals live in your community?

Extensions

- Create a class book about these helpers, with students contributing stories and pictures they create after the visits.
- Keep a record of any wild animals the children see on their walks. Do these animals appear all year or only in certain seasons? Create birdfeeders for your local birds.

Insect Walk

WHAT'S THE **Big Idea?**
Community

Enduring Understandings

- Communities are made up of the people, animals, and plants that live in them.
- Every living thing has a special role in its community.

Objectives

- Children cultivate their observation skills through noticing the insects that live in their community.
- Children show interest and curiosity in discovering different insects.
- Children learn that insects adapt to the coming cold weather in different ways.

Directions

1. As the last days of summer wane, ask the children about insects they have noticed? Do they know the name of any insects? Where do they usually see insects? What are the insects doing?
2. Many classrooms focus on the monarch butterfly in fall but many insects are going through adaptations as fall approaches. Besides migrating, some insects cluster together to keep warm (honey bees), spend the winter below the frost line (ants and termites) or as a chrysalis (black swallowtail).
3. Tell the children that they will be going on an outdoor Insect Walk, and their job is to use their "owl eyes" to find insects that live in your community. Distribute hand lenses if you have them.
4. Take the children on a walk either in the neighborhood or natural setting. As they discover insects, stop the group and engage students with some of the discussion questions. Bring an old white sheet and lay it on the ground at several different stops along the walk. Leave it there for several minutes as the children look for insects elsewhere. Have them come back to the sheet to observe who drops by for a visit!
5. When the walk is completed, process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions. The discussion may lead to further research to discover how various insects adapt to the change in the season.

Discussion Questions

- What insects live here? What are they doing?
- What do you notice about their bodies?
- What do you think they use these body parts for?
- How might these insects help out in our community?
- What are you wondering now?

Materials

- white sheet or dropcloth
- hand lenses, *optional*

Insect Song!

Sung to the tune of
"Head, Shoulders, Knees, and Toes"

Head, thorax, abdomen, abdomen
Head, thorax, abdomen, abdomen
Six legs, wings, antennae!

Or you can add:
Six legs, wings, exoskeleton!

Or…
Six legs, wings, and compound eyes!

Extensions

- ***Helpin' Bugs*** by Rosemary Lonborg
- Have children draw the insects they discovered and add their drawings to the learning wall.
- If your learning wall includes a map of the area you walked, place the students' illustrations at the location they observed the insects.
- Following a format similar to "Dress up a Sheep" (p.104), use your imagination to have the children "Dress up an Insect."
- Place plastic insects around the classroom to have children practice finding them.

Community Helpers: Our Classroom Community

WHAT'S THE Big Idea?
Interdependence
Community

Materials

- "Community Songs" (Appendix, p.220)
- crayons
- markers
- scissors
- cut-out person (child silhouette cut from paper), one per student

Extensions

- Put cut-out hands in an envelope. Each time a student helps or notices another student helping, write the student's name on the hand. Make a wall of helping hands for students to see how community members contribute to the community.
- Have students share with their parents who and what makes up their community. Have them share with their families one way they help their classroom.

Enduring Understandings

- Communities are groups of living and nonliving things sharing a common purpose or space.
- There are different kinds of communities.
- We are all members of a community.
- Our classroom is one community we are all a part of.
- We can be members of more than one community.
- We all contribute to our community.

Objectives

- Children cultivate understanding that a community is a group of people who work, learn, and play together
- Children discover how they are a part of their classroom community.

Directions

1. Ask students to share their ideas about what a community is. Explain that a community is a group of living and nonliving things sharing a common purpose or space.
2. Sing "Community Songs" with students (see Appendix, p.220).
3. Ask children how their classroom is a community. Ask them who makes up their classroom community. Explain that members of a community help make their community a good place to work, live, and play in. Ask children to describe ways they contribute to their community.
4. Demonstrate how to make a cut-out person by cutting out the person shape and then coloring it to look like yourself. Explain that the children are going to make a cut-out person of themselves.
5. Distribute the art materials and help the children personalize their cut-out people. Once everyone has finished, have them share their person and how they are a part of the classroom community. Ask them, "How do you help our classroom community learn, live, and play together?"
6. Hang all the cut-outs on a bulletin board titled, "Our Classroom Community is made up of Helpers!"
7. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What communities are you a part of?
- How do members of a community help each other?
- How do people in our classroom community help each other?
- How are you a part of this community?

Where Do I Live?

WHAT'S THE **Big Idea?**

Interdependence
Community

Enduring Understandings

- Homes are where we live.
- There are many different kinds of homes.
- People live in different kinds of homes than animals.
- Every living thing needs a home; each home is unique.

Objectives

- Children demonstrate an awareness of their own home and the shapes that make up homes.
- Children show interest and curiosity in where their classmates live.
- Children discover that not all homes are the same.
- Children build houses out of blocks and boxes and play "house."

Directions

1. Read *Maisy's House and Garden* by Lucy Cousins.
2. Show the children pictures of a variety of homes. Ask them to identify the ones they recognize. Do any look like their own homes? Why or why not?
3. Talk about the shapes found in people homes: squares, triangles, rectangles. Have children point out some of those shapes in the pictures.
4. Have children create their own home using paper, markers, shapes, and crayons.
5. On another piece of paper, have each child glue a picture of him or herself on the lower half of a page. Tape the house picture on top of the child's picture. Now, cut along the outline of the door of the house, leaving one side still attached. Fold the door back along this attached side, and reveal who lives here!
6. Display the students' homes in the classroom.

Discussion Questions

- What is the same about our homes?
- What is different?
- How are people homes different than animal homes? How are they the same?

Materials

- ***Maisy's House & Garden*** by Lucy Cousins
- pictures, photos, or examples of a variety of homes (dog house, apartment building, single family home, bird's nest, and duplex home, etc.)
- small photo of each child
- paper
- scissors
- markers
- glue
- shapes pre-cut out of construction paper: squares, rectangles, triangles
- blocks
- large boxes of many sizes to build 3-D homes

Note:

No Place Like Home

Be mindful of the living situations your students and their families or friends may be in. For children in transition, or living without homes, the idea of home can mean something very different than it does to those children with secure and safe housing. Consider the language you use and the images represented in your classroom and how they might relate to the lives of your students, and include as many types of housing (including shelters and shared housing) where you are able.

Extensions

- Draw a map of the school neighborhood and have students place their homes in the correct spot.
- Send supplies home with students so their families can help create their homes.
- Create 3-D homes using cardboard boxes.
- Create lift-the-flap animal homes.

Active in Winter! Animals on the Move

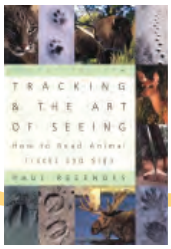
WHAT'S THE **Big Idea?**

Interdependence
Community

Materials

- ***Mammal Tracks and Scat: Life-Size Tracking Guide*** by Lynn Levine and Martha Mitchell
- ***Big Tracks, Little Tracks: Following Animal Prints*** by Millicent Selsam
- "Track Patterns" (Appendix, p.221)
- "Animal Track Templates" (Appendix, p.224)

Great Teacher Resource!



Tracking and the Art of Seeing by Paul Rezendes. Collins Reference, New York, NY, 1999

Enduring Understandings

- All animals are unique, but there are similarities in some of their behaviors.
- Animals move in different ways.
- Animals that are active in winter are actively looking for food.

Objectives

- Children demonstrate an understanding of animal signs they find in their school and back yards.
- Children explore the different ways animals move.
- Children practice their gross motor skills as they role play different animal gaits.

Directions

1. Read *Big Tracks, Little Tracks: Following Animal Prints* by Millicent Selsam. Discuss the book with children.
2. Show the children the animal "Track Patterns" handout. Ask the children to notice the pattern of the footprints and share what they see. Explain that a deer, dog, or cat leave a straight walker pattern, while the rabbit, squirrel, or chipmunk leave a hopper pattern. Some of the slower, fatter animals, such as the skunk, raccoon, or porcupine leave a waddler track. As you describe each gait, show the "Track Patterns" again to illustrate the gait for children. You could also lay down

practicing the "hopper" walk!

several track cards of an individual animal to illustrate the gait (ie. place deer tracks in a straight line.) Use the "Animal Track Templates" to make these track cards.

3. Give students the opportunity to try these gaits, reassuring them that humans are experts at walking on two legs and these gaits will be challenging for most of them. First, ask students to get on all fours and try to walk like a straight walker: in a straight line with one "foot" in front of the other. It's not easy for humans, but our four-legged friends—a cat or dog—do it easily!
4. Next, have children try the hopper walk by bringing both hands in between their knees and bringing their legs forward. Rather than hopping up, they hop forward with their legs sliding in front of their hands. This is easier said than done!
5. The waddler walk is slow and easy. Waddler animals have defenses other than speed. The skunk has its spray, the porcupine has quills, and raccoons can be very aggressive. Have children get on their hands and knees. Starting with their right side, move both right hand and leg forward at the same time. Now do the same thing using their left side. Continue shifting back and forth moving one side forward at a time.
6. Encourage children to use their knowledge of the patterns in which animals move to help them identify what animals are active in winter. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What was similar about the ways the animals moved? What was different?
- Which was the hardest gait for you to imitate? Easiest?
- Can you think of any other animals that waddle? Walk straight? Bound? Hop?
- Can you think of any ways that animals move that we haven't talked about today? (Slither, swim)

Extensions

- "Print Partners": Make two or three copies of each animal print, using the "Animal Track Templates," so that everyone in your class has one. Cut out each print without the animal label. Pass out a print to each student. They must find the other children who have the same print pattern(s). Once they have found their print partner, give each group a copy of the "Track Pattern" handout so they can try to identify their prints.
- "Track Stories:" Children create a bulletin board with animal tracks and homes they have spotted around their school and home.
- Make enough cards of each animal's track to help create animal "stories" in your classroom.

Dress up a Sheep

WHAT'S THE **Big Idea?**
Community

Materials

Gather the following materials into a large bag:

- **udder:** butter or cottage cheese container with 2 baby bottle nipples for the teats
- **horns & ears:** headband with cardboard ears and horns attached
- **hooves:** 4 socks with hoof prints on the bottom
- **stomachs:** four under-inflated balloons tied together
- **tail stub:** cardboard with cotton balls glued on to it

continued

Enduring Understandings

- Communities are made up of the people, animals, and plants that live in them.
- Many domestic animals provide food or fibers for humans.
- Sheep are one type of domestic animal raised by humans.

Objectives

- Children show interest and curiosity in learning the parts of a sheep by dressing up one of their classmates.
- Children consider the similarities and difference between human bodies and sheep bodies.
- Children develop an awareness of the relationship between sheep and humans.

Directions

1. Ask students to imagine a farm community. What animals might they find there? Explain to the children that they are going to dress up

Vocabulary (Bah, Ram, Ewe)

Udder: a female sheep has an udder that produces milk after she has had her first lambs. The udder has two teats from which the lambs nurse.

Teats: Any of the projections from the udder through which milk is discharged.

Tail: All sheep are born with tails, but most farmers "dock" or remove them when the lambs are about one week old.

Horns & ears: Both mail and female sheep are born with horns (unless they are a polled breed), and the farmer has the veterinarian remove them—many farmers do this themselves them (called dehorning). Sheep have ears to help them hear.

Hooves: A sheep has four legs with hooves on the bottom. Each hoof has two toes.

Stomachs: Unlike humans, a sheep is a ruminant, which means it has four parts to its stomach to help it digest its food.

Fleece: A sheep grows thick fur called fleece on its body. Farmers can shear off the fleece and turn it into wool yarn or felt. This is usually done in the spring. The sheep's fleece grows thicker in fall to provide warmth in winter.

one of their classmates as a sheep. Ask them to try to imagine what a sheep looks like and what special parts it has. What makes a sheep different from other animals?

2. Pick a volunteer from the class to be dressed up. Have the child stand somewhere everyone can see.
3. Ask the children to suggest how to make the volunteer look more like a sheep. As they come up with ideas, pull the appropriate prop from your bag, and dress up the volunteer. Alternatively, if the children are not sure of a sheep's anatomy, have a child pull a prop from your bag and guess what it might be, then dress up the volunteer.
4. After you have dressed up the volunteer with all the sheep props, ask the children what they could add to make the volunteer look even more like a sheep (e.g., eyes on each side of their head, teeth, etc). Discuss how different we are from sheep. How are we similar?
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- How are our bodies similar to a sheep's body? How are they different?
- Where do sheep live?
- Why do farmers keep sheep?
- Who else lives in a community with sheep?
- What role do sheep play in our community?

Materials *continued*

- **fleece:** Sheepskin or a wool sweater (Check online for sources for buying sheep fleece, e.g., www.pitchfork.org sells raw, dirty fleece; www.zwool.com sells clean roving for spinning or felting batt for felting projects.)

Extensions

- ***Emma's Lamb*** by Kim Lewis
- ***Feeding the Sheep*** by Leda Schubert
- Sing sheep songs, "Mary Had a Little Lamb," or "Baa, Baa Black Sheep."
- Combine this activity with "Farm Barnyard," p.111.
- Visit a sheep farm or have a sheep farmer visit your class.

Notice the resemblance?

Signs in the Snow

WHAT'S THE **Big Idea?**

Interdependence
Community

Materials

- See "Animal Homes" (p.91) for instructions in setting up various wild animal homes in your classroom
- ***In the Snow: Who's Been Here?*** by Lindsay Barrett George
- pretend snow (old white sheets, cotton batting, or cotton)
- discarded artificial or real evergreen trees *(see tip)*
- sets of animal track cards (Appendix, p.222)
- "Animal Homes" sheet (Appendix, p.219) cut into cards
- fake animal scat (fecal waste)
  - **deer**: coffee beans
  - **rabbit**: cocoa puffs
  - you can also purchase *Repliscat* from:
    www.trackandscat.com
    www.acornnaturalist.com
- pine cones, acorns, butternuts, downed hollow logs, tree browse (examples of branches or limbs that have been eaten, browsed, by animals)

Tip!

Plan to do "Signs in the Snow" after your winter break. Ask families to donate their Christmas trees in January and recycle these old trees to create your winter landscape.

Enduring Understandings

- Every living thing has a unique role, or niche, in its community.
- Animals live in a place because they can find food, water and shelter.
- Predator animals hunt other animals for food. This animal food is called prey.
- We can use clues left by animals to discover who lives here and what they have been doing and eating.

Objectives

- Children demonstrate an understanding of the signs animals leave behind.
- Children show interest and curiosity in reading animal signs.
- Children practice solving mysteries by reading animal signs.
- Children create their own animal stories using props.
- Children demonstrate an understanding that animals adapt to winter by building shelter and eating what is available.

Directions

PART 1: In the Classroom

1. Set up your classroom with a few "track stories"—mysteries for children to solve that include an animal home, its food browse, footprints, and scat. For example, scattered nuts and pine cones below a hole in a pine tree with small hopper tracks on the ground would represent the home of a red squirrel. You can replicate the general wintry outdoors with real or artificial evergreen trees, and cotton batting or white sheets to represent snow.
2. Allow the children to walk around observing the "stories." Encourage them to figure out who lives here by reading the clues in the story.
3. Have the children share their findings. What "stories" did the animals leave behind? What clues made it possible for them to know this?
4. Read the book, *In the Snow: Who's Been Here?* Ask the children if they would like to revise their animal story after hearing the story.
5. Show the animal and footprint card sets to the class. Divide the children into small groups and have them create their own track stories using prints, homes, food, and scat.
6. Once the children's track stories are set, groups ask others to "read" their story. At this time, it's not necessary for the stories to be accurate. Instead, allow the students to think about what signs the animals leave for us to "read." As children's tracking skills increase, they can edit their stories to make them more accurate. Stories can be photographed or written down to share at a later time.

PART 2: Track Stories Outside

7. After practicing "reading" track stories indoors, take the class outside to explore tracks that may be in the schoolyard. Look for signs of both domestic and wild animals. Even if there is no snow, children can find tracks in the mud or frozen in ice. Scat and browse are always there if our "owl eyes" are working.
8. Once you have located tracks, draw a circle around the print in the snow to help preserve the print for others to see.
9. Look for signs of food that the animal may have been eating: buds eaten off the tips of branches (nibbled buds high on the plant may have been deer, lower munches might be rabbits), empty nut shells, holes dug in the snow.
10. Look for signs of scat. The fecal waste of wild animals tells much about their life. Fox will often leave their scat upon a rock, very deliberately letting all know this is their territory. Rabbit scat looks much like the cereal, cocoa puffs, but if it is lighter brown in color, the rabbit may have eaten the original scat to get the very last of the nutrients from it. Deer scat resembles coffee beans.
11. Notice any other clues left behind. Sometimes, an animal will leave behind some fur. It takes real "owl eyes" to find strands of fur! Animal homes are sometimes more visible in the winter. Look for holes in snow. Notice their size. Try to determine what animal may inhabit this hole. Every time you go out with your students you are guaranteed to find something new, it's all in the eyes of the beholder.

Discussion Questions

- What kinds of clues do animals leave behind?
- How do the clues help us know who lives here?
- What did you need to do to read the animal stories?

When you find a track outdoors, draw a circle around it to help preserve the track for all to see.

Set up "track stories" indoors with an animal's tracks, scat, food, and home.

Extensions

- After a group shares its story, have everyone else turn away as the group removes one part of the story. The class looks back and uses their "owl eyes" to determine what has changed.
- Set up small pop-up tents and plastic tunnels covered with white sheets to represent snow-covered animal homes for children to role play being animals in winter. Use a small plastic slide as an otter slide so students can slide into an ice-covered pretend pond.
- "A Winter's Meal," (p.108)
- "Active in Winter," (p.102)
- ***Who Lives in the Snow?*** by Jennifer Berry Jones
- ***Animals In Winter*** by Henrietta Bancroft
- For teachers: ***Tracking and the Art of Seeing*** by Paul Rezendes

A Winter's Meal

WHAT'S THE **Big Idea?**

Interdependence
Community

Materials

- ***Animals In Winter*** by Henrietta Bancroft
- apron and chef's hat
- large soup pot
- wooden spoon
- trays, one for each small group of children
- samples of plants, animals, and insects found in your area throughout the year (samples can be real, artificial, or images). This could include flowers, leaves, twigs, berries, green grass, insects (rubber or plastic), rubber mice, bark, acorns, butternuts, etc. Make sure to include items that would be found in your natural habitat.
- a photo, puppet, or stuffed animal representing:
  - rabbit
  - chipmunk
  - songbird
  - woodchuck

  You can also use the "Winter Animal Cards (Appendix, p.225).

Enduring Understandings

- All things change, and can adapt to change.
- Animals react to the change in season in different ways: some are active, some are dormant, some migrate, and others hibernate.

Objectives

- Children role-play animals in winter.
- Children show interest and curiosity in how local animals adapt to the winter.
- Children demonstrate an understanding of why and how animals adapt to winter.

Directions

SET-UP: Prepare trays with a variety of the samples of plants, insects, and animals distributed amongst them. Set up your cooking workspace with a soup pot and a wooden spoon. Place your animal puppets, photos, or cards around the room. (Place the woodchuck—a hibernator—in a quiet, dark, out-of-the-way place, where it cannot be easily found.)

1. Read *Animals In Winter* by Henrietta Bancroft. Discuss the book with your students.
2. Dress yourself up as chef and gather students around your cooking workspace. Explain that as the chef, your job is to cook for the animals who are active in winter. Really ham it up! (One of our educators likes to become "Fifi the French Chef"—complete with accent.) Tell the children that you need their help to determine what foods are available outside at this time of year for wild animals to eat.

With your students, sort a tray of animal food into two piles: what's found outside in winter, and what's not.

3. Divide the class into smaller groups and give each group a tray. Each group divides the objects on their tray into two piles:
   - Found outside in winter
   - Not found outside in winter.
4. After the groups have divided the the objects, ask for volunteers to bring the "food" to your pot. As each group presents their selections, ask the rest of the children to confirm whether or not each item can be found outside in winter. If the answer is yes, it goes into your soup pot. Once all the possible options have been placed in the pot and are "simmering," tell the children that it's time to call out to the wild animals, "Soup is on! Come and get it!" But only animals who enjoy the foods in the soup can visit your kitchen. Tell the children that these animals are placed around the room.
5. Ask one child to find an animal and approach the soup pot. Identify the animal and invite the child to assume the role of the animal. (Give the child hints if needed).
6. Depending on which animal the child chooses, follow the "active," "migrating" or "dormant" scenario below. Repeat steps 5 and 6 with different children for each scenario.

Active in Winter?

Animals use various strategies to cope with winter's challenges: cold temperatures and food scarcity.

- **Active:** An animal can find enough food to support staying active and warm. *(bobcat, coyote, deer, fox, rabbit, squirrel)*
- **Dormant*:** An animal minimizes activity. It slows its breathing and heart rate to conserve energy for extended periods. *(black bear, chipmunk, raccoon, skunk)*
- **Hibernating*:** An animal minimizes activity. It slows its breathing and heart rate, *and* lowers its body temperature to conserve energy for extended periods. *(bat, jumping mouse, woodchuck)*
- **Migrating:** A complete population of animals travels to another area for more reliable food supply, temperatures, or breeding purposes. *(many birds: warblers, loons,)*

**Most animals that are dormant or that hibernate will periodically roust themselves to forage for the limited food that is available. This uses a LOT of energy, and is risky for the animal.*

- If the child chooses the **active** rabbit, have the child hop around looking for food to keep her energy up. Ask, "Can rabbit eat from our soup?" Explain that winter can be hard for herbivores (plant-eating animals), like the rabbit, since there is no green grass, dandelions or garden vegetables growing. Explain that the rabbit has adapted to winter by eating the stems and buds of woody plants like blackberry, raspberry, maple, oak and sumac plants. Ask the children if any of these buds or stems are in the soup. Invite rabbit to eat from the soup pot and then transform back into a child.
- If the child chooses a **migrating** songbird, have her fly into the soup kitchen, very anxiously looking for berries and insects to eat. Ask the children if there are any fresh, juicy berries or insects in the soup pot. Since there are not, suggest that the bird get moving and fly to a place that is warmer and where juicy berries are growing and insects are alive. Explain that some animals migrate to warmer areas in the winter.
- If the child chooses a **dormant** chipmunk, have the child act somewhat sleepy, trying to decide if it should crawl from its burrow in the ground to come to the soup kitchen. Explain that as an omnivore (an animal who eats both plants and animals),

Extensions

- Create a class list of animals that you see when outside for recess or on neighborhood walks. Try to discover what food these animals eat and how they can survive.
- Keep a class calendar in the winter months where you record "special" animal or bird spottings.

the chipmunk's diet consists of grains, nuts, seeds, insects, and salamanders. The chipmunk has stored nuts and seeds to eat over the winter in its burrow. Explain that some animals are dormant, or very sleepy in the winter—they roust themselves only occasionally to get food. Tell the children that it's a beautiful day, and the chipmunk is outside. Ask if your soup has any nuts and seeds in it. Invite the chipmunk to try some of your delicious soup before it scurries back to its burrow to sleep for most of the winter, waking occasionally to eat its stored food or run out into the cold sunshine.

7. Let the children know that there is still one more animal in the room. Can anyone find it? Choose a child to go find this last animal. Explain that this animal, a **hibernating** groundhog, is in a deep sleep for the winter and will not be moving. Tell the children you notice it is hardly breathing, its heartbeat is very slow and it feels quite cold. Encourage the children to ask why? Tell the children to think about what a groundhog eats. If they do not know, explain that you have seen this groundhog eating green grass and stealing fresh vegetables from your garden. Ask the children if these food are in your soup pot. Ask, "Are green grass, fresh vegetable outside in the winter?" No, of course not. Explain that since his or her food is not available, this groundhog adapts by sleeping through the winter, and wakes up in the spring when her food becomes available again.
8. Use the animal cards to review the ways animals adapt to winter. Show some animals that haven't been discussed yet and ask the children whether they think this animal hibernates, migrates, is dormant, or is active in the winter. Use the box on the previous page to help you. As you describe each behavior, ask the children to act out that behavior.

Discussion Questions

- What's happening with animals in winter in our community?
- What different kinds of behaviors do they have? Do you know of any other animals that have similar behaviors? Remind the children that these behaviors are adaptations. Ask, "Can you think of ways these animals might behave in the summer?"

Farm Barnyard

WHAT'S THE **Big Idea?**
Interdependence
Community

Enduring Understandings

- There are different kinds of communities.
- A farm is one kind of community.
- Some farms have only one type of animal, such as a dairy farm with just milk cows; other farms have a variety of animals.
- Farmers raise animals for their food and fiber.

Note:

If you are not familiar with farm animals or where to find local farms and resources, check these agricultural connections:

- **Farm-based Education Network** www.farmbasededucation.org
- **Farm to Preschool:** www.farmtopreschool.org
- **Ag in the Classroom** *(state and national levels)* www.agclassroom.org
- **Cooperative Extension Service** *(State and national program under USDA; the 4-H section often includes education ideas & resources):* www.csrees.usda.gov/Extension/

Objectives

- Children demonstrate an understanding of the animals that live on farms.
- Children show interest and curiosity regarding farm animals' life cycle and families.
- Children play "farmer" using various props such as farm animal puppets, plastic figures, or toy tractors.

Directions

1. Gather the children in a circle and ask, "Who lives on the farm?" As children offer their answers, show a small plastic farm animal or display a picture or felt version of the various animals.
2. Ask the children "What happens on a farm?" Have the children set up a farm scene as they discuss what they know about these animals.
3. Read *Farmyard Banter* or *Animal Sounds*. Discuss the sounds and motions the various farm animals make.
4. After the story, hand each child a picture of a farm animal to wear around their neck. Have the students wear their picture face down so no one can see it. Explain that there is more than one picture of each animal.
5. When the teacher calls out "Farm Barnyard,"

Materials

- ***Farmyard Banter*** by Denise Fleming, or ***Animal Sounds*** illustrated by Aurelius Battaglia
- wooden barn, plastic farm animals and toy tractors
- felt board with felt farm animals, felt barns
- "Farmyard Animal Cards" (Appendix, p.229). Laminate several cards of each adult animal, and add strings to hang around children's necks, one per child
- samples of animal products:
  - **dairy cows**: empty dairy product containers (milk, yogurt, cheese)
  - **beef cows**: leather belts, shoes, steak dog toy, can of beef stew
  - **sheep:** wool sweater, mittens, hand lotion (lanolin from wool)
  - **goats:** empty goat cheese containers

continued

- **pigs:** empty bacon package, ham containers, football, bristle paint brush
- **chickens:** egg cartons, chicken noodle soup can, toy rubber chicken leg
- **turkey:** turkey meat products, feathers
- **rabbits:** angora sweater or mittens, rabbit meat package
- **ducks or geese:** feather pillows, down jacket

each child makes the sound and motion of their animal picture. They move around trying to find animals that match theirs.

6. Once they have found their animals, the group should choose their animal product(s) from a collection of animal products. For example, the chickens would pick out the empty egg carton or an empty box of chicken tenders.
7. Once each group has selected a product, have them share it with everyone. Other groups should guess what animal makes those products.

Discussion Questions

- What animals live on farms?
- What are farms for?
- How can a mother farm animal find her baby if all the babies look alike to us?
- How do farmers care for their animals?
- What products do humans get from farm animals?

Extensions

- ***Farm Animals*** by Gallinard Jeunesse and Sylviane Perols
- ***On the Farm*** by Alastair Smith
- Try to match adult animal cards to the corresponding baby animal cards. (Appendix, p.231)
- Play "Motion, Music, & Mannerisms: A Farm Animal Scavenger Hunt" (Appendix, p.232)

Pond Critters

WHAT'S THE **Big Idea?**
Interdependence
Community

Enduring Understandings

- The pond habitat is a community where many insects, mammals, amphibians and reptiles live.
- Many of these creatures depend on each for other as a food source.

Objectives

- Children show interest and curiosity in the great variety of creatures that live in a pond.
- Children discover that these creatures often need to eat one another to survive.
- Children experiment with creating some of these creatures from craft materials.
- Children play in their constructed pond or wetland.

Directions

1. In your ongoing discussions about community, introduce the pond or wetland habitat by reading *In the Small, Small Pond* by Denise Fleming.
2. Tell children they will become "Pond Explorers" as they look for the community of critters who live in a pond. Discuss and chart, if you wish, which pond critters the children have seen, and which critters they hope to see. Discuss what safe and respectful behavior will look like at the pond. Remind students that they are there to observe and record what lives in the pond habitat. Plants and animals stay in the pond.
3. Travel to the pond you will explore. When approaching a pond or wetland, take time to stop, look, and listen. Children will be anxious to start dipping but have them observe first and discuss how this is a wild spot and you may find animals but maybe not!
4. Remind children that most of the critters they will be dipping for are very tiny. Have them look at their thumbnail for comparison: many of the critters living in this habitat are that small or smaller! It can be helpful to remind children that they might not catch anything. To increase the chances, carefully submerge the net or strainer into the water, bring it out and look closely. Is anything moving? Look again.

Materials

- pond or wetland to explore, transportation if needed
- ***In the Small, Small Pond*** by Denise Fleming
- plastic wash tubs
- metal food strainers
- aquatic nets
- magnifying boxes
- clipboards, paper
- writing tools
- guides to identify pond critters, such as ***Water Insects*** by Sylvia Johnson. See also "Water Critter Chart" (Appendix, p.233)

Frog Catching!

Catching frogs is slick business. Use the soft aquatic nets, not the metal strainers as these can harm the frog's skin. Move the net quickly over the frog, pull the net towards you, and clasp the net, closing off the opening so the frog will not escape. Place the frog in the plastic bins filled with water, knowing that it will escape and head back to the water. That's a good thing. To hold a frog, grab it firmly behind its back legs and rub its belly to calm it. Of course, once you start catching frogs, children forget about the interesting little macroinvertebrates and are totally focused on frogs. You may want to establish a time limit or a frog catching day. Once a frog has been caught, it is in shock, so when it is released it will move slowly. Our rule is, once a frog has been released, it is "home free" and cannot be caught again that day.

5. If there is movement in the net or strainer, take it to one of the plastic tubs that have been filled with pondwater and drag the net or strainer backwards through the water, releasing any macroinvertebrates or insects caught. Once the critters are in the collection bin, they are in a safe zone. Encourage your young naturalists to continue collecting and assure them they'll get to investigate their catch when everyone is done dipping.
6. After dipping for an appropriate amount of time (gauged by children's engagement and your time constraints), gather everyone around the plastic collection bins. Separate individual critters into magnifying boxes or yogurt containers. Try to get just one type in each container. Pass containers around and have students record their findings on their clipboards or science journals.
7. Have field guides or other resources available to help children identify their critters and adaptations these critters have to survive in a wet habitat.
8. Return all critters to the pond or water before leaving. Wash out containers to remove any small critters like scuds or leeches.
9. Back in the classroom, add findings to a classroom map or science journal of wild sightings. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What pond critters did you see? (Add these to the chart from the earlier discussion.)
- What did the critters do?
- Are the pond critters a community? Why or why not?

Extensions

- If possible, take trips to the pond throughout the seasons to help children see the full picture of this habitat.
- If you are unable to take your class to a pond, find a pond where you are permitted to dip for critters. Place them in a bucket of pond water, NOT tap water, and bring them into your classroom to put into your water table. Allow a few children at a time to observe the critters. Return critters to the same pond in a few days.
- Set up a simulated pond or wetland in your classroom:
  - **water**: blue tarp
  - **lily pads**: green paper cut-outs
  - **duckweed**: scatter hole-punched circles from green paper.
  - **cattails**: long cardboard tubes, painted brown, with thin, green, paper leaves and a furry brown material for cattail head
  - **inhabitants**: frog, duck, and dragonfly puppets or paper cutouts
  - Children can draw pictures of what they have seen at the pond to add to their classroom pond.
- See "Water Babies Match Up" in *What's Happening,* (p.168).
- ***Near One Cattail: Turtles, Logs and Leaping Frogs*** by Anthony D. Fredericks
- ***What's In the Pond*** by Anne Hunter

Community Helpers: Who Helps?

WHAT'S THE Big Idea?
Community

Enduring Understandings

- Each person is part of a community.
- People have different roles in their communities.
- Members of a community depend on each other.
- We can all be community helpers.

Materials

SESSION 1:

- ***Community Helpers from A to Z*** by Bobbie Kalman

SESSIONS 2+:

- neighborhood map
- list of questions generated by children in Session 1

Objectives

- Children demonstrate awareness of different roles in a community.
- Children show interest and curiosity by generating a list of questions they would ask community helpers about their role in the community.
- Children engage in the community through visits to community helpers.

Directions

This facilitated learning experience can take place over several days or weeks, depending on the time you have available.

SESSION 1:

1. Ask students what it means to help. Follow this by asking what it might mean to be a community helper. Ask who are the helpers in your community? In your school? In your classroom?
2. Read *Community Helpers from A to Z.* Discuss the text with the children. Ask if they would be interested in meeting some of the helpers in their community.
3. Tell children that they will be getting a chance to meet some community helpers.
4. Identify and explain some community helpers that the children will meet (postal worker, firefighter, baker, police officer, etc.). For each helper, ask children what questions they might like to ask the helper. Guide the children to generate questions that get at how these community members help the community and the importance of their roles. Make sure to include a question that asks the helper for ideas on how the children can be helpers themselves. Record the children's questions on chart paper.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Students meet the police officers who serve the local community.

SESSIONS 2+:
Repeat this session for each community helper you plan to visit.

6. Before beginning, arrange for children to visit a community helper, or alternatively, invite a community helper to visit children in the classroom.
7. Tell children that they will be going on a visit (or be visited by) a community helper.
8. Revisit the list of questions children generated for that community helper. Review safety and behavior expectations. Use this opportunity to discuss how children are also members of the community and can help by working together, listening, etc.
9. If walking to visit the community helper, engage the children as you walk by singing "Community Songs" (see Appendix, p.220), and greeting other community members you encounter.
10. When meeting with the community helper, have students ask their prepared questions. Tour the site and encourage new questions.
11. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What is a community helper?
- Who are community helpers?
- Are all community helpers the same? How are they different?
- How do they help the community?
- Why are community helpers important?
- Are you a community helper? How?

Extensions

- Have students pretend to be community helpers and practice their interview skills by interviewing each other.
- Play "Who Am I?" Have a child role-play a community helper and have the other children try to guess which helper they are.
- Using a map of the neighborhood, have children locate and mark the location where the various community helpers work.
- Prior to walking out into the community, have children locate their school and the site of the community visit. Count the blocks, note the street names. As you walk, count features, such as crosswalks or stoplights. Explain how these features also help keep people safe in the community. (See "Docu-Walk: Our School Neighborhood," p.95.)
- Set up the housekeeping corner as the police station, the bank, and the grocery store so children can role-play community helpers they have met at sites they visited.

Dress up a Cow

WHAT'S THE **Big Idea?**

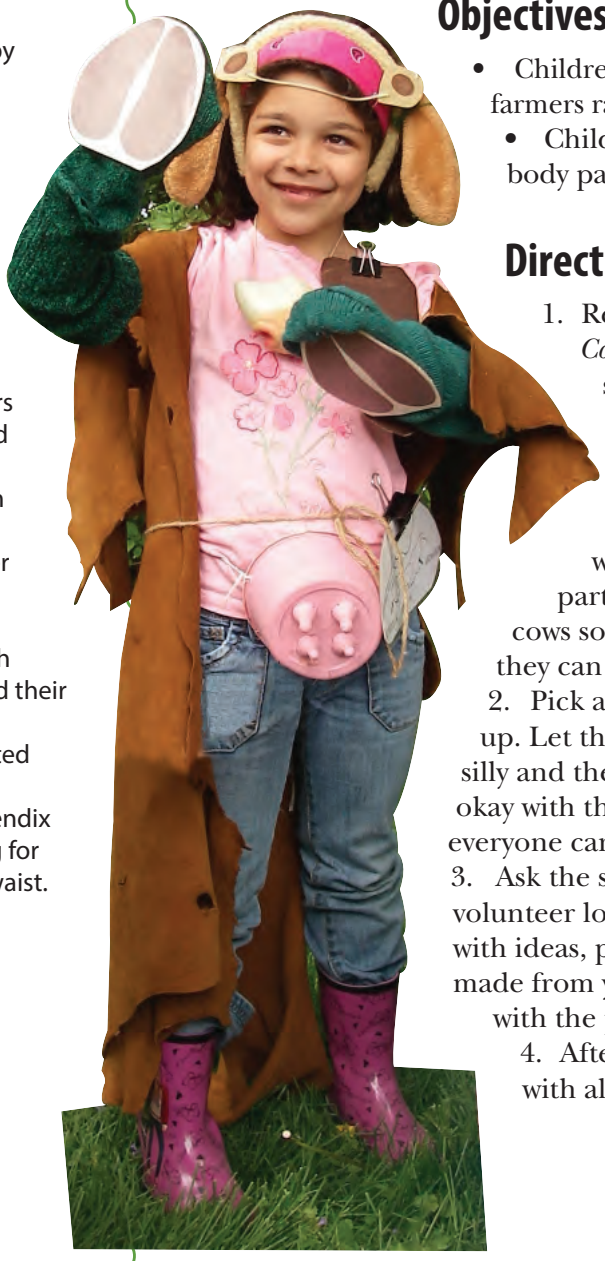
Interdependence

Materials

- ***How Now, Brown Cow?*** by Alice Schertle

Gather the following materials into a large bag. Each item represents a part of a cow.

- **udder:** cool whip container with baby bottle nipples for the teats with a string for tying around the waist
- **tail:** fly swatter with string for tying around waist
- **horns and ears:** headband with cardboard ears and horns attached
- **hooves:** 4 socks with hoof prints on the bottom
- **tongue:** sandpaper cut to the size of a real cow's tongue, with a clip to attach somewhere around their neck area
- **stomachs:** laminated picture of a cow's stomach, see Appendix p.236, with a string for tying around the waist.



Enduring Understandings

- All animals have certain characteristics such as how they look, what they eat and how they behave.
- Observing and learning about animal characteristics can help us better understand them, and how we are all part of a community and interdependent.
- Dairy cows have unique body parts.

Objectives

- Children demonstrate an understanding of why farmers raise milk cows.
- Children show interest and curiosity in the body parts of a cow.

Directions

1. Read a few poems from *How Now, Brown Cow?* by Alice Schertle to give your students an idea of the many types of cows. Explain to the students that they are going to dress up one of their classmates or an adult helper as a cow. Ask them to try to imagine what a cow looks like and what special parts it has. Show them a few pictures of cows so that even if they have never seen one, they can participate. What makes a cow unique?
2. Pick a volunteer from the class to be dressed up. Let them know that they are going to look silly and the others may laugh at them. Are they okay with that? Have him or her stand where everyone can see.
3. Ask the students to suggest how to make the volunteer look more like a cow. As they come up with ideas, pull the appropriate prop that you have made from your bag, and dress up the volunteer with the prop.
4. After you have dressed up the volunteer with all the cow props you have, ask the

A cow's tongue feels like sandpaper!

students what they could add to make the student look even more like a cow (e.g., fur, eyes on each side of their head, big wet nose, teeth).

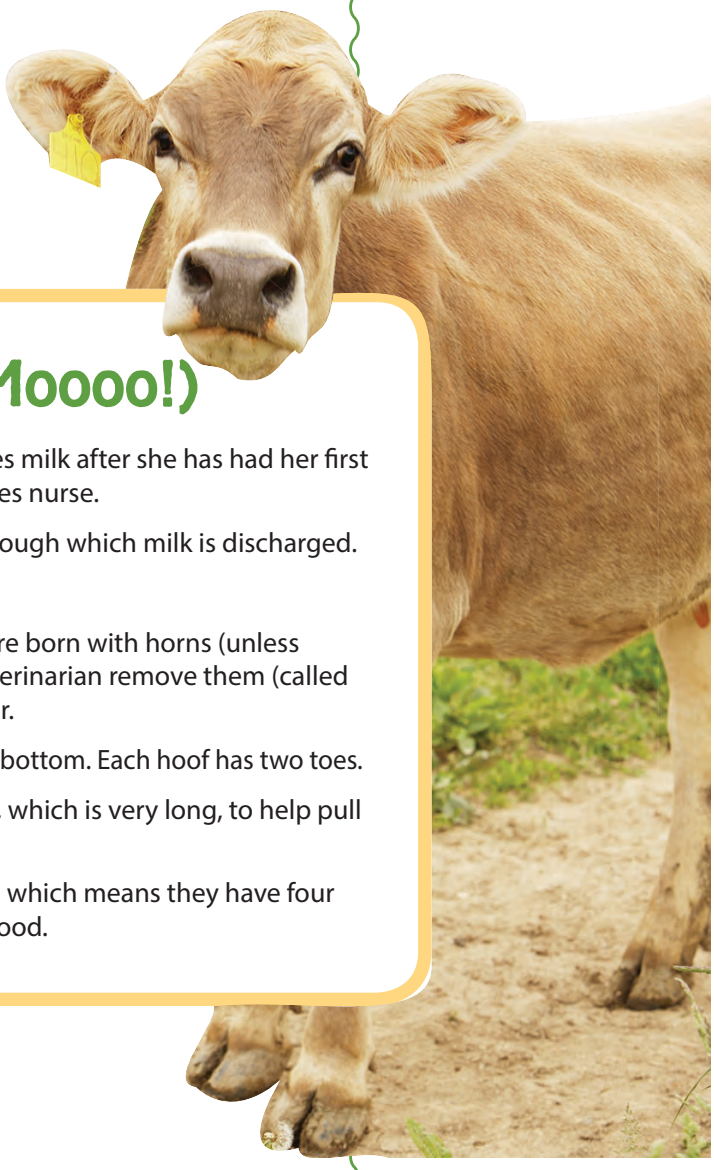
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Discuss how are we different from cows. How are we similar?
- What other animals are similar to cows?

Extensions

- Have several bags of Dress up a Cow props so that children can use them during free choice time. Include farmer-type clothes, heavy boots, long pants, hat, flannel shirt, so others may dress up as farmers to tend the cows.



Vocabulary (Click Clack, Moooo!)

Udder: A female cow has an udder that produces milk after she has had her first calf. The udder has four teats from which the calves nurse.

Teats: Any of the projections from the udder through which milk is discharged.

Tail: Cows use their tails as fly swatters.

Horns and ears: Both male and female cows are born with horns (unless they are a polled breed), and the farmer has a veterinarian remove them (called dehorning). Cows have big ears to help them hear.

Hooves: Cows have four legs with hooves on the bottom. Each hoof has two toes.

Tongue: Cows use their sandpaper-like tongue, which is very long, to help pull in the grass and hay that they eat.

Stomachs: Unlike humans, cows are ruminants, which means they have four parts to their stomach to help them digest their food.

Fairy Homes

WHAT'S THE **Big Idea?** **Community**

Materials

- ***Fairy Houses*** by Tracy L. Kane
- access to outside space and natural materials such as old logs, leaves, sticks, stones, bark, feathers, nut shells

Enduring Understanding

- Even make-believe characters can live in a community.

Objectives

- Children develop their imagination as they create a fanciful world of fairies.
- Children experiment with natural materials to create fairy houses.
- Children play with fairy homes they made.

Directions

1. Read *Fairy Houses* and discuss what and how they were made. Inevitably, someone will say they don't believe in fairies. This is a good opportunity to talk about imagination, the fantasy world, and people's right to believe or not. If a child doesn't want to build a fairy home, she or he could build a human shelter, or a home for another forest critter, like squirrels or chipmunks.
2. Go to an outdoor setting, even a school playground with no trees, and look for any natural materials that would be appropriate for building. If there are no such materials, ask parents to help contribute or go for a weekend hike to collect materials where it is allowed. Encourage children to use materials that are already down and not pick live plants. Talk about respecting the land and each other's houses.
3. Create fairy homes. Often, children want to leave notes or signs for the fairies, so bring along paper and writing tools to help with this.
4. Revisit the fairy homes to see what has changed and add to the fairy neighborhood. Prepare students for the fact that fairy homes can sometimes be damaged by natural or human forces, but remind them that they can always be rebuilt.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Extensions

- Build fairy homes throughout the seasons.
- Engage in the imaginative narrative of the fairy houses with the children. For example, find evidence of "fairy writing" in insect-chewed wood and translate it for children. *(One summer, the fairies in our forests sent the children messages of greeting and thanks for respecting the forest.)*

Discussion Questions

- Describe your fairy home.
- What natural materials did you use to build your fairy home?
- What does it feel like to use your imagination to create fairy homes?
- Are the fairies a community? Why or why not?

Sweet as a Bee

WHAT'S THE **Big Idea?**
Community Interdependence

Enduring Understandings

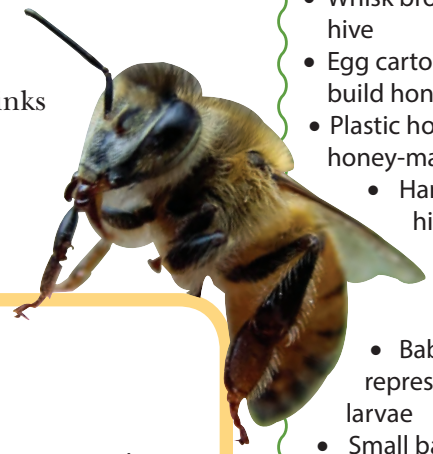
- All living things are part of communities.
- Honey bees are social insects and have very specific jobs in their bee community.
- Honey bees depend on each other to survive.
- In a bee community, there are a queen bee, drones, and worker bees.

Objectives

- Children show interest and curiosity in an insect they might have considered "bad."
- Children demonstrate the jobs that honey bees in a hive do.
- Children cultivate an understanding of how honey bees help humans through pollination and producing honey and beeswax.
- Children role-play as honey bees.

Directions

1. Start a discussion about honey bees. How many children see honey bees as a threat? Everyone will want to share bee sting stories. Inquire if anyone thinks bees might be helpful? Talk about those responses.
2. Read *Are You A Bee?* by Judy Allen and revisit the question, "Are honey bees helpful?"



Vocabulary (Buzz... Buzz...)

Queen: Head of the hive who is busy laying up to 15,000 eggs a day.

Drones: Male honey bees whose only job is to mate with the queen bee when she leaves the hive to start a new one. In the interim, the drones hang around in the hive, being waited on by the female worker bees.

Nurses: Honey bees who make food, called *brood food,* for the young larvae or baby bees.

Guards: Honey bees who hang out at the entrance of the hive to smell every insect coming in the hive. If the smell or *pheromone* is not the correct smell, the guard bees protect the hive and drive the wrong- smelling insect out of the hive.

Materials

- ***Are You A Bee?*** by Judy Allen

Props for honey bees:
- **queen:** paper crown
- **drones:** several bow ties or neckties
- **larvae:** old white socks, stuffed (The larvae look like small, fat white worms.)

Assortment of the following props for all the **worker bees:**
- **nurses:** several white, paper nurse caps
- **guards:** two or three heavy cardboard cones with string to tie around the waist
- Whisk broom to clean the hive
- Egg cartons with which to build honeycombs
- Plastic honey jars for honey-making bees
- Hand fans to cool the hive
- Trays for the bees who wait on the queen
- Baby bottles to represent feeding the larvae
- Small baskets for the worker bees who leave the hive in search of pollen and nectar

Bee Song!

Sung to the tune of
"Do Your Ears Hang Low?"

I'm a honey bee,
Pollen baskets on my knees
And a stinger on my tail
So you're afraid of me.
But I'd rather gather nectar,
I'm an excellent collector,
I'm a honey bee.

Extensions

- ***Busy, Buzzy Bee*** by Karen Wallace
- ***The Beeman*** by Laurie Krebs
- If possible, get materials to build bee hives from beekeepers or beekeeping supply stores, such as: **http://beekeeping.glorybee.com.** Allow children to put on beekeeper equipment and put together supers and frames.
- Invite a beekeeper to your classroom to explain her job.
- Have bee costumes for children to wear during dramatic play:
  - **wings:** cardboard or cloth
  - **compound eyes:** sunglasses
  - **thorax:** cardboard with string to loop over head with six legs attached with velcro,
  - **stinger:** a cardboard cone tied around the waist sticking out over child's buttocks.

3. Discuss the various roles a bee plays in its short lifetime. Show the children the props and ask if anyone would like to play bees and beekeeper.
4. Distribute props. Step back and let the beehive get humming! Encourage "bees" to switch roles as bees don't stay in the same job for long. There can only be one queen and that can "bee" tricky to navigate. Have your students determine a way to share the responsibilities in the hive.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What was one of your jobs as a bee that you enjoyed?
- How are bees like humans?
- How are bees a community?

What's Happening?

What's Happening? is an opportunity to explore, observe, discover, and examine how people, plants, animals, and communities change over times. This Thread focuses on building understanding of human and natural life cycles, adaptations, and transformations, as well as the interplay between the human and natural world. By studying how someone or something changes over time, students learn that our world is cyclical and in a constant state of flux. By returning to a place or concept throughout the year, students form a deep understanding and appreciation of their place—which is foundational to cultivating stewardship.

WHAT'S THE **Big Idea?**

- **Cycles:** Every organism and every system goes through different stages.
- **Change over time:** All organisms, places, and systems are constantly changing.

Enduring Understandings

- Change is part of life: all things change, and can adapt to change.
- Change is always happening, but may not be seen as it occurs.
- Change occurs at different rates and on different scales (change can happen fast or slow; it can be a big change or a little change).
- By comparing the past to the present we can detect change.
- Cycles have no beginning and no end; they are continuous.
- There are all sizes and shapes, types and lengths of cycles (e.g., butterfly life cycle, seasons, a production chain, bus routes, phases of the moon).
- We can impact cycles, and how things change or do not change.

Connecting beyond the Classroom

Family Connections

What's Happening? offers many easy and rich opportunities for families to continue learning with their children at home. Share with families the Essential Questions, Big Ideas, and Enduring Understandings of the Thread. Ask families to use this language at home with students to

facilitate transfer of children's learning. Invite families to send in photos of their child (or other family members) throughout years, showing how they've grown and changed. Seek stories and photos documenting changes in your community or neighborhood. Suggest that families talk with their child about how their family has changed over time (origins, location, new family members), or how the child's own bedroom has changed as they've grown (for example transitioning from a crib to a bed). Families may also be able to donate older digital cameras for children to use as they document "what's happening."

Service-learning Opportunities

Service-learning engages children in improving the quality of life in their community through meaningful curriculum and focused learning activities. As children explore What's Happening throughout the seasons, they can take part in caring for their environment by raking leaves, shoveling snow, spring clean-ups, or weeding gardens. Build a collection of child-sized tools for these tasks to give children the option of participating in this valuable service-learning work. Organizing a campus or neighborhood day of service (raking leaves in the fall, shoveling in the winter, cleaning up or planting in the spring) when your whole community works together also provides a great opportunity to learn about seasonal cycles and build community.

People & groups in your community

Connect with these people, organizations and places to explore changes and cycles in your community.

- Retirement community
- Historical society
- Museum
- Newspaper
- Library
- Town recreation department
- Meteorologist
- Bus systems
- Garbage/recycling companies

Community Connections

Children can discover the many ways their community has changed over time by connecting with local people and organizations. Partnering with a retirement community, historical society, or local museum can provide glimpses of the past while building and strengthening existing relationships. Your local newspaper or library can provide a record of community history through text and photos. To explore seasonal cycles in the community, check out seasonal programming offered by your local parks and recreation departments or YMCAs. Connect with a local meteorologist, and invite them to visit your classroom. Observe the trees in your neighborhood: how do they change over time? Set up a bird feeder that is easily visible from your classroom and observe what occurs. Daily or weekly civic routines can also offer opportunities to observe cycles in your community, and can lead to further inquiry: Bus routes: children can collect data on how often buses come, map the bus routes, and could even take a field trip to ride a bus route. Garbage and recycling pickups: children can discover when these pick-ups occur, and explore where the discarded materials go after they are picked up. As you focus on "what's happening?" many options for connecting to the community will emerge.

Dear Families,

We are so excited to be embarking on an exploration of **What's Happening?**

We wanted to share our plans with you so that you might discuss what we are learning with your child. For this study, the question "What's Happening?" will guide us as we explore:

- how people, plants, animals, and communities change over time and throughout the seasons
- human and natural life cycles, adaptations, and transformations
- the relationship between our human and natural worlds

Our goal is to help your child develop a strong understanding of the **cycles** of life and how all things **change over time**. They'll come to understand that:

- Change is part of life: all things change, and can adapt to change.
- Change is always happening, but may not be seen as it occurs.
- Change occurs at different rates and on different scales (change can happen fast or slow; it can be a big change or a little change).
- By comparing the past to the present we can detect change.
- Cycles have no beginning and no end; they are continuous.
- There are all sizes and shapes, types and lengths of cycles (i.e. butterfly life cycle, seasons, a production chain, bus routes, phases of the moon).
- We can impact cycles, and how things change or do not change.

We invite you to send in photos of your child's (or other family members') life throughout years, showing how they've grown and changed. To extend our study at home, you can talk with your child about how your family has changed over time, or even how your child's own bedroom has changed as they've grown (for example, transitioning from a crib to a bed). Another great way to observe change together as a family is to watch the moon and record its appearance over the course of a month!

If you have an old digital camera that you'd be willing to donate to our classroom we'd greatly appreciate it. We'll be learning to take photos as we document how things change!

Thank you!

WHAT'S the "BIG IDEA?"

Cycles: Every organism and every system goes through different stages.

Change over time: All organisms, places, and systems are constantly changing.

Self-guided Opportunities

Loose Parts

Try including natural materials such as leaves from different seasons, seeds, and other seasonal outdoor artifacts such as helicopters (seed pods from maple trees), acorns, or burdocks. As always, building blocks should be offered, and can be a great tool for building three-dimensional maps. The classroom Explore Table can host the elements (water, ice, snow, soil, leaves). In your outdoor area, a mound of dirt and a variety of kid-sized tools can provide a great opportunity for children to effect change over time as they play in and redistribute it. Encourage children to add to the Loose Parts collection as they discover seasonal artifacts on their adventures, and notice with them how these treasures change with the seasons.

Dramatic Play

There are countless ways for children to play out "what's happening"—your collection may include a stockpile of clothes for a variety of different weather conditions (don't forget the sunglasses), mirrors, and dress up clothes from different eras. In the playhouse area, children can travel through time with historical or futuristic household props (rotary phones, cell phones). Kitchens of the past can easily be recreated with a cardboard box for a cooking hearth, and a few simple cooking pots and long-handled wooden spoons. Garlands of leaves (both summer's green and fall's warm spectrum) can be found at craft stores and serve as great props for imaginative play.

Outdoor Play

The outdoors provides an incredible canvas for observing cycles and change. Encourage the children to make observations and ask questions about what they experience, and help them make connections to the past and predict what they might experience in the future. Tools such as cameras and journals allow children to record their observations and practice their fine-motor skills. A variety of child-sized tools to move dirt, leaves, or snow will also allow children to engage directly with "what's happening" outside. Once you've introduced the "Sit Spot" (see p.135), encourage children to return on their own to their spot and journal or simply sit.

Art

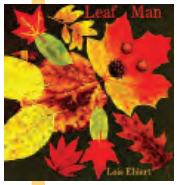
Watercolors are a great medium for children to capture the sky and weather on paper. Encourage children to collect seasonal treasures on their outdoor adventures and use these items in art projects. Explore

Linda's Picks

for WHAT'S HAPPENING?

Animals in Winter by Henrietta Bancroft and Richard G. Van Gelder. *Harper Collins, NY, NY, 1997.*

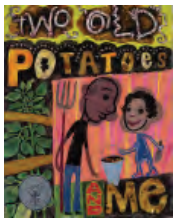
Tracks, Scats and Signs by Leslie Dendy. *Northword, Merrimack, NH, 1995.*



Leaf Man by Lois Ehlert. *Harcourt Childrens Books, Boston, MA, 2005.*

Planting the Wild Garden by Kathryn O. Galbraith. *Peachtree Publishers, Atlanta, GA, 2011.*

Bear Snores On by Karma Wilson. *Simon and Schuster, NY, NY, 2002.*

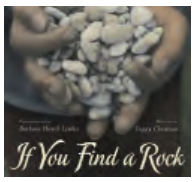


Two Old Potatoes and Me by John Coy. *Dragonfly, 2009.*

Flower Garden by Eve Bunting. *Sandpiper, 2000.*

Pumpkin Circle by George Levenson. *Tricycle Press, Berkeley, CA, 1999.*

A Log's Life by Wendy Pfeffer. *Aladdin, NY, NY, 2007.*



If You Find A Rock by Peggy Christian. *Sandpiper, 2008.*

the waste and recycling cycles as you transform "trash" into "treasures"—provide egg cartons, berry baskets, bottlecaps, strings, fabric scraps, anything really, for children to "upcycle" into new creations. Whatever their medium, encourage children to capture their observations of What's Happening in their artwork.

Numeracy

With cycles and change at its core, *What's Happening?* is all about patterns: weather, seasons, calendar, bus routes. Encourage children to notice and name these patterns. Creating and using sequencing cards that help children write or create a sequence or cycle are great ways to understand changes and cycles. Recording the weather through measurement of the temperature, or collecting data about the amount of leaves left on a tree, provide opportunities to compare and contrast days, weeks, months, and seasons. Help children notice change, and the different rates and sizes of

changes. Record each child's height several times throughout the year so they can watch themselves grow! Create graphs and charts with children to organize and analyze the data you've collected.

Explore Table

Set up a place in the classroom for children to investigate and explore. A plastic bin filled with worms and compost will allow them to observe and touch materials as they decompose and transform into soil. Provide cloud charts or other field guides to the natural world. Bring the elements into the classroom: snow, ice, leaves, and soil are all fantastic things for curious children to explore. Many classroom hatch chicks from eggs; use this as an opportunity to talk about life cycles and change.

What's Happening?

WHAT'S THE **Big Idea?**
Cycles
Change over Time

Facilitated Learning Experiences:

KEY: Community • Food & Farming • Nature

EVERY SEASON

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Owl Eyes

WHAT'S THE **Big Idea?**

Change over Time

Enduring Understandings

- Observation skills help us detect change over time.
- Good observation skills can be perfected through practice.
- Everything changes.
- By comparing the past to the present we can detect change.

Materials

- photo, puppet, or image of owl posted somewhere visible in the room

Objectives

- Children demonstrate the ability to notice small physical changes.
- Children experiment with making small changes in their appearance and/or surroundings to help others perfect their observation skills.
- Children show interest and curiosity in how the natural and built worlds change.

Directions

1. Gather the children on your rug or meeting area. Explain that throughout the year they will be exploring their schoolyard and neighborhood. To explore, they will need to be good observers. Ask, "What is a good observer?" and "What does a good observer need to do?" After discussing the skills of looking carefully and slowly, ask if they know of an animal or bird that is a good observer. Tell them of all the animals they have mentioned, you would like them to develop "owl eyes." Place your fingers around your eyes to make large owl eyes. Look slowly and carefully around the room; ask the students to do the same. Have an owl puppet or picture somewhere in the room and ask them to find the owl with their "owl eyes." Once they have spotted it, ask them to hoot softly like an owl.

Extensions

- ***Can You Find Me? A Book About Animal Camouflage*** by Jennifer Dewey
- ***I See Animals Hiding*** by Jim Arnosky
- ***Sky Tree*** by Candace Christiansen and Thomas Locker
- Place five to ten objects relating to a topic (such as, rubber or plastic frogs, salamanders and dragonflies if you are exploring a pond habitat; or spiders, millipedes, and snakes if you are exploring the forest floor) on a tray or table, have children observe the objects, children close their eyes as you remove one of the objects. At the count of three, children open their eyes, raise their hand if they can identify the missing object.
- When outdoors in a familiar place, have children observe their surroundings, then walk away as two of their classmates make a subtle change in the area. The class walks backs and tries to identify the change.
- On weekly walks, take photos of a tree, building, garden, etc. Compile the photos into a book where the children can identify the changes, if any, throughout the year.
- Look for animal tracks, tame and wild, around the schoolyard. Have children use their awesome observation skills to identify which animal left the tracks.

2. Explain that they will test their "owl eyes" again in the "Owl Eyes" game. They will be using their "owl eyes" to detect changes. Have a child stand in front of you and use their "owl eyes" to take a picture of you with their mind's camera. Then have the child turn away from you while you change one small part of your physical appearance (e.g. take off your sweater, roll up a pant leg, put on a hat, or change your hairstyle).
3. Ask the child to turn around, look closely and make up to five "educated guesses" to deduce what has changed. Most people, children included, want to name the change right away. In an effort to put the focus on observation skills, encourage the observer to ask more general questions first. For example, "Did you change something from your waist up?" Have the observers keep track of the guesses by raising a finger for each guess. Encourage the use of all five guesses to build the practice of asking good questions that move from general to specific. This will help children focus more on learning to ask good questions rather than focusing on getting the "right" answer.
4. Once you have modeled the process, pair up the children to play "Owl Eyes" with their partner. The children can take turns being the "observed" and the "owl." After the owl has guessed correctly or used up five guesses, they switch roles.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What do you see?
- What, if anything, has changed?
- How do you notice changes? (Help children think about strategies and process: do you scan from top to bottom, looking at specific areas, etc.)
- How do you keep in your mind what you saw and how it changed?
- What are some good questions you can ask to help you determine what has been changed?

Shake it, Shake it Shake it! (Buttermaking)

WHAT'S THE **Big Idea?**

Change over Time

Enduring Understandings

- All things change.
- We can impact how things change or do not change.
- Change occurs at different rates and on different scales (change can happen fast or slow; it can be a big change or a little change).

Objectives

- Children discover that liquids can change into solids.
- Children experiment with turning heavy cream into butter.

Directions

This activity can be done on its own, as part of a study on solid and liquids, or as part of a dairy unit.

1. Discuss with children their ideas on how butter is made. Record their ideas.
2. Read the book, *Brown Cow, Green Grass, and Yellow, Mellow Butter* by Ellen Jackson. Did anyone have the right method?
3. Gather your group into a circle, explaining that they will all need to help turn this heavy cream into butter. Heavy cream is the thick, fat-rich part of milk with a fat content of 36–40%. If fresh, unpasteurized milk is left to sit, cream rises to the top. Allowing the cream to reach room temperature will speed the transformation into butter.
4. Fill a small glass or plastic jar with ¾ cup of heavy cream. Make sure the lid is on tightly, and hold it with two hands as you begin to shake it up and down. After demonstrating how to shake, pass the jar around the circle.
5. As the first person is shaking, ask everyone to shake their hands as you all sing the first verse of the Butter Song. Pass the jar with each new verse.
6. As each verse is sung, shake a different part of your body. Sing it louder, softer, sing it in the language of cows, sheep, pigs!
7. Check the jar occasionally by opening the lid. Pass

Materials

- ***Brown Cow, Green Grass, and Yellow Mellow Butter*** by Ellen Jackson
- heavy cream, at room temperature
- a jar with a lid, capable of holding one cup of liquid
- small colander, a bowl, and butter knife
- soda crackers

"Shake It" Song

Sung to the tune of "I Have Something in My Pocket" or the "Brownie Smile Song"

We're going to make some butter,
Rich and creamy too,
With milk from a cow's udder
Before you can "moooo."

Chorus:
So shake, shake, shake it,
Shake it if you can,
Shake it like a milkshake
And shake it once again.

Pour some cream into a jar,
Get a friend or two,
Make sure the lid is on tightly,
That's all you have to do.

Chorus

We're learning while we're churning,
Hey, this is lots of fun,
It's easy to make butter,
Let's eat it when it's done.

Chorus

Oh, listen very carefully,
It's sounding different now,
Hooray, it's finally butter!
Be sure to thank a cow.

it around so everyone can see that something is happening. It will thicken into a whipped-cream consistency, but it is not butter yet.

8. After 5–10 minutes, listen for the sound of liquid sloshing in the jar. A pale, thin liquid—the buttermilk—will be surrounding the butter. Sing the final verse.
9. Carefully, pour the contents of the jar into the colander. As the buttermilk passes through, a beautiful lump of yellow butter will remain. Rinse the butter with cold water to remove all of the buttermilk if you plan to store it. This is not necessary if you plan to eat the butter immediately. The buttermilk can be reserved for use in baking.
10. Spread the butter on crackers and eat. As you enjoy the butter, process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What did you expect would happen to the cream before we started?
- What happened to the cream?
- Can you think of anything else that changes from a liquid to a solid? Or a solid to a liquid?

Extensions

- With older children, divide them into groups of 3–5. Give each group a sampling of utensils such as a bowl, colander, fork, whisk, egg beaters, small jar with a lid, and beaters without the mixer, along with a ½ cup of heavy cream. After looking at the utensils, have each group write a plan for turning cream into butter, specifying what utensils they will use. Once they have a plan, begin the process. As students enjoy the benefits of their inquiry, have them evaluate the success of their plan.
- Chill butter in old-fashioned butter molds. Decorate the butter with sprigs of fresh herbs or edible flowers.
- Make flavored butters such as honey butter. Add raspberries and a bit of sugar.
- ***A Cow, A Bee, A Cookie and Me*** by Meredith Hooper and Alison Bartlett

Sit Spot

WHAT'S THE **Big Idea?**

Change over Time

Enduring Understandings

- Change is always happening, but may not be seen as it occurs.
- Change occurs at different rates and on different scales (it can happen fast or slow; it can be a big change or a little change), you have to be observant to notice.
- By comparing the past to the present we can detect change.
- Returning to the same location on a series of occasions gives us the opportunity to witness change over time.

Objectives

- Children discover what's happening as they cultivate their observation skills.
- Children show interest and curiosity in changes happening all around them.
- Children become aware of changes in their community, natural and built.

Directions

It can be helpful for children to develop their "owl eyes" (p.131) prior to beginning this experience.

1. Explain that today children will be finding a special spot that will be their "Sit Spot." They will have a chance to visit their sit spot many times. While they are in their sit spot, their job is to quietly sit still as they use their "owl eyes" to notice everything they see, hear, and feel. Sometimes they will stay at their sit spot for only a couple of minutes, other times they will be there longer. Set any guidelines for choosing a sit spot, such as safety considerations, ability to see a teacher, etc.
2. Go outside to your sit spot area and encourage children to pick a spot. Ask them to sit silently and use their "owl eyes" to observe what's happening. Build children's capacity for sit spots by starting with a minute or two and eventually progressing to longer sits.
3. Gather the group together and process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.
4. Repeat the "Sit Spot" practice regularly.

Discussion Questions

- What did you notice? What did you see? Hear? Smell? Feel?
- What's happening?
- What has changed since the last time you visited your sit spot? What is the same?
- What are you wondering?

Materials

outdoor space with enough places for children to spread out and find a spot where they are still visible for supervision

Extensions

- Let children bring a journal to their sit spot to record their observations. Share their journalling when you debrief.
- Change the focus of the sit spot from external to internal attention. Ask children to go to their sit spot and close their eyes while they pay attention to their breath as it enters and leaves their body.
- Could the children take turns using the class camera to take photos of their spot to record changes. Use photos in a book about their sit spot or a class book about the various sit spots.

Camouflage

Materials
None

WHAT'S THE **Big Idea?**
Cycles
Change over Time

Enduring Understandings

- In order to survive, many animals have adaptations, such as camouflage, to aid their survival as either the predator (the hunter), or the prey (the hunted).
- Camouflage is the coloration or patterns that help an animal to appear to blend in with its surroundings to aid in its survival.
- Some animal fur changes colors in the winter to blend in with the white snow.
- Poisonous, brightly colored creatures provide a warning system to predators: "Don't eat me!"

Who Eats Who?

Camouflage: Adaptation that allows animals to blend in and hide from predators, or to be a well hidden predator that can sneak up on its prey.

Herbivores: Animals that eat only plants.

Omnivore: Animals that eat plants and other animals.

Carnivores: Animals that only eat other animals.

Predators: Carnivores and omnivores that hunt for prey.

Prey: Animals being hunted by other animals for food.

Objectives

- Children cultivate their visual discrimination skills.
- Children discover the meaning and role of camouflage.
- Children role play the predator/prey relationship.

Directions

1. Gather children into a circle. Invite them to look at their clothing. Which child would have the easiest time hiding in the winter woods? Who could hide in a summery flower garden? A muddy spring field? Discuss their color choices and combinations.
2. Have the children go and try to blend in with or match things in the room, the playground, or the forest. See how invisible they can make themselves. Encourage them not to hide behind their object, but rather try to blend in with it. If necessary, use a plastic creature to demonstrate the difference between blending in with the surface and hiding under or behind something.
3. Ask children if they can think of why an animal might want to hide or blend into their surroundings. Discuss the terms camouflage, prey, and predator.
4. After the children have practiced camouflaging themselves, pick one child to be the predator. With his or her eyes closed, the predator counts to twenty as the other children camouflage themselves in the room, playground, or forest.
5. The predator opens his or her eyes and looks around for camouflaged classmates. He or she cannot move, but may turn in circles. The predator calls out names as she spots others. Those spotted must come in and join him or her, but cannot disclose the location of those still camouflaged. The winner is the child closest to the predator who has not been spotted. The winner gets the reward for

great camouflaging, and gets to be the next predator.

6. If the children are so well camouflaged that they can't be spotted, the predator can close her eyes and count to twenty as children move even closer. The predator opens her eyes and begins the process again.
7. When the game is over, process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What made it easy for you to camouflage yourself? What made it hard?
- Why do animals use camouflage?
- What would happen if animals couldn't use camouflage?
- What animals would be well camouflaged in winter/spring/summer/fall?

Extensions

- Play camouflage throughout the year. Have children discuss how their clothing changes through the seasons: colors, amount, or type of clothes. How do these clothing changes affect their ability to camouflage? How do the changes in the natural world affect this ability?
- Have the children create a forest creature out of sticks, grass, nuts, leaves, etc. Students then camouflage their creature on the forest floor and have the others try to find it. Discuss findings.
- Use small construction paper squares to set up a camouflage hunt in your room (make some obvious and some hard to find). See how many the children can find. Which were the easiest? hardest?
- Have the children camouflage small lengths of colored pipe-cleaners on top of a brightly colored quilt. Ask other classmates to find them.
- Set camouflage puppets, stuffed animals or rubber creatures in a wooded setting. Then, have the class stalk quietly along a trail and silently count on their fingers the creatures they spot. Discuss findings, go back and try again.
- ***What Color Is Camouflage?*** By Carolyn Otto
- ***Animals in Camouflage*** by Phyliss Linbacher Tildes
- ***Twilight Hunt: A Seek-and-Find Book*** by Narelle Oliver

Docu-Walk:
What's Happening Now?

WHAT'S THE **Big Idea?**

Change over Time

Materials

- digital camera(s) *(optional)*
- journals *(optional)*
- a large, handmade map of the school and neighborhood community (or the area in which you will take your walks)

Extensions

- Make books that document the changes you've observed with the photographs and drawings you collect on your walk.
- Gather historical photos of your community and compare the more distant past to the present day. What's changed? What has stayed the same?
- Invite elders in to tell stories of how the neighborhood has changed for them.
- If you are lucky enough to have some construction going on in the school neighborhood, document the changes through photos and children's drawings of the process.

Enduring Understandings

- Change is always happening, but may not be seen as it occurs.
- Change can happen fast or slow; and be a big or a little change.
- By using our observation skills to compare the past to the present we can detect change.

Objectives

- Children cultivate their observation skills.
- Children demonstrate an awareness of the natural and human communities they are a part of.
- Children show interest and curiosity in what's happening all around them.
- Children discover that they can detect change by comparing the past to the present.

Directions

Consider taking Docu-Walks regularly. The more frequently children visit and observe what's happening around them, the more data they will have to compare the past to the present. It can be helpful for children to develop their "owl eyes" (p.131) prior to beginning Docu-Walks.

1. Look at the map of your community with children. Talk about the places they've been and the things they've seen. Once you have completed a couple of Docu-Walks, look at the photographs and drawings from previous trips.
2. Venture out on your walk. Stop along the way as children notice things. When you notice evidence of changes, point them out (i.e., "Look at this tree: all the leaves have fallen off." or "Look! This store is closed today but it was open last time we walked by.")
3. Document what you find as you walk, either in photographs or journals. When you return to the classroom, add pictures taken or drawn by the children to your learning wall. Documentation of the same sights (and sites!) over time will allow children to "see" change. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What did you observe?
- What's happening today?
- What's changed since last time? Why might it have changed?
- What's the same?
- What do you predict might be different next time we go out?
- What are you wondering?

Pumpkin Paradise

WHAT'S THE **Big Idea?**
Cycles

Enduring Understandings

- All living things have needs.
- Food comes from nature: from plants and animals.
- Pumpkins, like all plants, have a life cycle.

Objectives

- Children show interest and curiosity in the life cycle of the pumpkin.
- Children discover that pumpkins make good eating.
- Children experiment with baking and measuring.

Materials

- ***The Pumpkin Circle*** by George Levenson
- pumpkins
- ingredients and equipment for making pumpkin muffins (see Recipe Card on next page)
- "Pumpkin Life Cycle Cards," (Appendix p.235)

Note:

FRUITS are defined as the part of the plant that develops from the flower after a flower has been pollinated. The fruit contains the seeds to start a new plant.

VEGETABLES are defined as any edible part of a plant that does not contain a seed. Vegetables are the roots, stems, leaves, and flowers of plants.

Directions

Grow pumpkins in your school garden, if possible. If not, visit a pumpkin patch so that each child can harvest a pumpkin of his or her own.

1. Ask the children where a pumpkin comes from: It grows on a plant. How did that plant grow? Challenge the students to figure out the life cycle of a pumpkin. Hand out the pumpkin life cycle cards to the students. Ask them to arrange themselves in order from seed to pumpkin pie.
2. After the group feels they are in the correct order, have them tell a story of a pumpkin seed growing up. Move from student to student, each describing the picture they are holding as a part of the story. When finished, students can color in their own pumpkin cycle and write (if appropriate) their own pumpkin life cycle story.
3. Read *The Pumpkin Circle* by George Levenson. Discuss the life cycle of the a pumpkin, and the different things you can do with pumpkins.
4. Show the children the pumpkins, and cut the top open. Have the children help scoop out the inside and harvest the seeds to roast and eat (see recipe on next page). Cook the pumpkin,

remove the skin, and mash it.

5. Make pumpkin muffins with the children. Let the children experiment with measuring ingredients and stirring. Before beginning any cooking project with children be sure to review good hygiene.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Where do pumpkins come from?
- What came first, the pumpkin or the seed?
- What parts of the pumpkin can you eat? *(seeds, pulp, flower)*
- What do people do with pumpkins?

Extensions

- ***The Pumpkin Circle: A Story of a Garden*** by George Levenson

- "Weight Guess:" Find 4 or 5 pumpkins in a variety of sizes. Weigh each pumpkin and write the weight on the bottom in permanent marker. Have students pick each pumpkin up and estimate/guess how much each ways. For perspective and comparison, have a 5-pound bag of sugar and a pint of cream (weighs a pound) Have a sheet for each pumpkin for students to record each of their guesses. Gather together and weigh the pumpkins or peek underneath for the real weight and compare to their guesses.
- "Fruit Vegetable Sort": Using a bag of groceries you have purchased at the store, sort the produce in piles of fruit or vegetable (see box on previous page). As you investigate each fruit or vegetable, cut them up to see if seeds are inside. End this activity with a taste test of what you have sorted.

Pumpkin Paradise Muffins

Prep time: 15 minutes | Cooking time: 18–22 minutes

INGREDIENTS

1 ½ c. whole wheat flour
¾ c. honey or sugar
1 tsp. baking powder
1 tsp. baking soda
pinch of salt
1 tsp. cinnamon
1 c. cooked pumpkin
2 large eggs lightly beaten
½ c. canola or vegetable oil
1 c. plain or vanilla yogurt or applesauce

INSTRUCTIONS

1. Preheat oven to 400°F. Spray muffin tins with cooking spray.
2. Mix flour, sugar, baking powder, baking soda, cinnamon and salt in large bowl. In a separate bowl whisk together pumpkin, eggs, oil, and yogurt. Combine wet and dry ingredients until just blended
3. Spoon batter into muffin tins until ¾ full. Bake for 18–22 minutes or until toothpick comes out clean.
4. Transfer muffins to rack to cool.

Roasted Pumpkin Seeds

Prep time: 20 minutes | Cooking time: 20–25 minutes

INGREDIENTS

Pumpkin
2 Tbsp. olive oil
Salt to taste

INSTRUCTIONS

1. Preheat oven to 275°F.
2. Scoop the seeds out of a pumpkin. Remove as much of the pulp as possible.
3. Rinse the seeds in a colander, then dry the seeds with a paper towel.
4. Spread the seeds over a cookie sheet, sprinkle on the olive oil and add salt.
5. Cook for 20–25 minutes. Check often so they don't burn.

Putting the Garden to Bed

WHAT'S THE **Big Idea?**
Cycles
Change over Time

Enduring Understandings

- Change is part of life: all things change, and can adapt to change.
- Plants have a life cycle.
- Fall is the time when most plants in the garden have died and we need to get the garden ready for winter.

Materials

- a garden, ideally with potatoes awaiting harvest
- small trowels, child-sized shovels
- baskets or bags for harvested goods
- hay or leaves (enough to cover garden bed)

Objectives

- Children demonstrate an awareness of a plant's life cycle.
- Children cultivate a taste for a variety of vegetables.
- Children show interest and curiosity about what is growing in the garden.
- Children discover that not all plants grow above the ground.

Directions

If you are fortunate enough to have a school garden, fall is the best time to be in it. Most produce has been harvested and it is time to to see what is left and if it is edible. If you don't have a school garden, find a parent, grandparent, or a community garden group that will allow your class to help put it to "bed."

1. Ask the children what they think may still be growing in the garden. Explain that you are going to "put the garden to bed" until next spring by harvesting any food that is left, and then cover up the garden with a "blanket" of hay or leaves for the winter.
2. Venture out to the garden and survey what is there. Plan your work, and locate and harvest any remaining food.
   a. Root vegetables such as **carrots, turnips, radishes** can be harvested later into the season after the first frost. Wiggling and giggling is the best method for young ones to get them out in one piece.
   b. Harvesting **potatoes** is like digging for gold! Make sure to plant potatoes in your garden. (They grow well in containers, too). Children will dig for quite some time in hopes of finding

harvesting potatoes is like digging for gold!

Extensions

- ***Two Old Potatoes and Me*** by John Coy
- ***The Enormous Potato*** by Aubrey Davis
- Play hide-and-seek in the old corn stalks once all the corn has been harvested.

another potato! Digging with your hands works best so as not to chop into the potatoes and it seems there is always one more tiny potato growing in the soil.

c. **Kale** is one of the last vegetables to go and can be harvested right up to the first heavy frost.

3. Pull the last of the plants from the garden to put into the compost pile.
4. Have the children lay hay or leaves on top of the beds for a winter blanket.
5. Return to the classroom and process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What did we find in the garden? How many different plants can you remember?
- How did these plants get here?
- What else might have been here during the summer?
- Why did we take out the old, dead plants?
- What will happen to the garden over the winter? What will happen in the spring? Next summer? Next fall?
- What was your favorite part of putting the garden to bed?

Roasted Roots

INGREDIENTS

Any assortment of root vegetables: potatoes, carrots, beets, turnips, whatever you have!

INSTRUCTIONS

1. Have children wash all the vegetables.
2. Preheat your oven to 350°F.
3. Chop the vegetables into about 1-inch chunks and place them in a bowl.
4. Have the children lightly coat the roots with olive oil and sprinkle with salt.
5. Place the veggies in a baking pan and cook for 20 minutes or until tender.

Tip!

Children love to help chop the vegetables. A good source for cutting tools for young children is: www.forsmallhands.com. Pre-cut your carrots and other cylindrical vegetables in half lengthwise so that they have a flat edge and won't roll. They'll be easier for children to chop!

Kale Chips

INGREDIENTS

Kale!

INSTRUCTIONS

1. Have children pick the kale, wash and dry it, and tear it into chip-size pieces.
2. Place kale pieces on cookie sheet, add some olive oil and massage the kale to distribute the oil evenly.
3. Give it a sprinkle of salt and bake at 350°F for 10–15 minutes or until the edges are brown.

Seed Hunt and Sort

WHAT'S THE **Big Idea?**
Cycles
Change over Time

Enduring Understandings

- All plants, wild and domestic, go through life cycles.
- Most plants reproduce through seeds.
- Many plants drop their seeds in late summer or fall so the seed will spend winter in the soil and sprout in the spring.
- Not all seeds look alike; each type of plant has a specific seed.
- Seeds have some similar qualities: seed coat, embryo, food storage.

Objectives

- Children understand that most plant life begins and ends with seeds.
- Children show interest and curiosity in discovering seeds.

Directions

It can be helpful for children to develop their "owl eyes" (see p.131) prior to beginning this experience.

1. Read books about seeds to children. Use the discussion questions to process the reading and gather information about seeds. Ask children what questions they have about seeds.
2. Take the children on a walk around the schoolyard, field, or forest to look for seeds (e.g., acorns, dandelions, or maple tree seeds). Distribute egg cartons or yogurt cups to children to hold the seeds they collect. Visit a school or neighborhood garden to collect seeds from vegetables or flowers that have gone by.
3. Set up a seed collection area in the classroom where children can sort and classify the seeds. Have them share their display and the others can guess how they were sorted. By color? Shape? Size?
4. As the seed discovery and exploration continues, keep returning to the discussion questions. Ask the children what other questions they have about seeds.

Discussion Questions

- Where can we find seeds?
- Do all seeds look the same? How are they alike? Different?
- What is the purpose of seeds?
- How do seeds travel?

Extensions

- "Tree Life Cycle Cards" (Appendix, p.245)
- Wear old, large, wool socks over your shoes. Examine the seeds that your socks pick up.
- Create a Seed Scavenger Hunt for children (or see Appendix, p.237).
- Plant some of the seeds. Watch what happens!

Materials

- books about seeds, such as ***How A Seed Grows*** by Helene Jordan and Loretta Krupinski, ***The Dandelion Seed*** by Joseph Anthony, ***A Seed is Sleepy*** by Dianna Hutts Aston, or **The Wind's Garden** by Bethany Roberts
- empty egg cartons for holding collected seeds
- magnifiers and magnifying boxes
- empty yogurt cups

Gathering the Leaf Creatures

WHAT'S THE **Big Idea?**
Cycles

Materials

- ***Leaf Man*** by Lois Ehlert
- outdoor explore backpack or bag with journals, writing implements, water bottle
- old telephone books to press leaves

Extensions

- Use child-sized rakes and create large piles of leaves to jump into!
- Find the biggest leaf, the smallest leave, the reddest leaf, the holiest leaf, etc.
- ***Why Do Leaves Change Colors?*** by Betsy Maestro *(an informative concept book)*
- Children create a class book with their leaf creatures.

Enduring Understandings

- Change is part of life: all things change and can adapt to change.
- Change is always happening.
- In the fall, leaves on the trees change color and fall off the trees.

Objectives

- Children show interest and curiosity about the changes in leaves that take place in the fall.
- Children experiment with leaves to create characters.
- Children play with fallen leaves.

Directions

1. Read *Leaf Man* by Lois Ehlert to your students. Discuss the book, and then explain that you will be going on a leaf hike to gather leaves to create interesting leaf creatures. (See p.41 for tips on creating guidelines for outdoor experiences with children.)
2. Venture outside, and hike through your schoolyard and neighborhood collecting various autumn leaves, choosing ones that have some possibilities to be turned into interesting creatures.
3. Back in the classroom, let the children create leaf creatures from their findings. Transcribe stories to go with their pictures. Compile the stories into a Leaf Creature book to share with others.
4. Talk with students about the season, explaining that each fall the leaves on many trees change color and fall off of their trees. Ask students if they know what happens to the leaves on the trees in the other seasons. Continue to process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What different-colored leaves did we find? What different shapes?
- How would the leaves look different if it was summer?
- Why are the leaves different shapes?
- What creature did you create with your leaf? Share your creature's story.

Be a Sugar Maker

WHAT'S THE **Big Idea?**
Cycles

Enduring Understandings

- Humans can use the water cycle to their benefit.
- Sap, consisting mainly of water, can be changed into sweet syrup by heating the sap to evaporate most of the water.

Objectives

- Children role-play the maple sugaring process as they become sugar makers.
- Children experiment with taplines, funnels, and water.

Materials

Set up an area in the classroom as a sugar bush and sugar house. Hang paper trees on the walls of your room, attach "buckets" made of empty rolled oats boxes covered in foil. Fill buckets with corks or packing peanuts so children can "collect sap" and take it to be boiled in the evaporator pan. Set up the sugarhouse with the evaporator pan, a basket with wood scraps, fire gloves, and empty match box. Place "tools" in the evaporator pan such as a spatula to use as a sheeting tool, a slotted spoon to get any bugs out of the sap, and a wooden ruler to make sure there is always 2 inches of sap in the pan so it won't burn.

Here's what you'll need to transform your classroom in to a sugarhouse.

- firewood
- empty match box
- simulated "fire" (for example, crumpled up red and orange tissue paper)
- heavy gloves: the pan and arch get very hot!
- buckets: to catch the finished syrup as it is poured off the pan
- ladles: used to test whether the sap is "sheeting." As water evaporates from the sap, the sap thickens. To test the thickness, sugarmakers dip a special ladle into the sap and watch how the sap slides off. If it comes slowly off the edge of the ladle in one thin "sheet," then the sap is close to being syrup. (See photo, p.150.)
- ruler: there needs to be 1 ½ to 2 inches of sap in the evaporating pan or it will burn.
- slotted spoon: used to remove foam that naturally occurs


tapping a tree


collecting sap


boiling sap into syrup

the evaporator pan with the fire arch underneath it

during the boiling process. It will also remove any bugs that have snuck into the sap!

- thermometer *(pretend, or broken is fine)*, to test whether sap has become syrup. Sap turns into syrup when its temperature reaches 219°F.
- a tall plastic cup and stick to represent the hydrometer. The hydrometer is an instrument used to measure the density of syrup. If you add a little syrup to the hydrometer cup, and the stick in the hydrometer floats, the syrup is dense enough to pour off the pan. Sap becomes syrup when it is boiled down to 66% sugar.
- empty syrup containers
- hammers
- tree taps
- "Sugaring Tools Cards" (see Appendix, p.239)
- a cardboard box approx. 4 ft. x 3 ft. x 4 in., to make **evaporator pan** *(see photo at left)*. Cover the box in aluminum foil or paint it silver. To make the evaporator pan more authentic, cut the flaps off the box before covering with foil, and use the two longer flaps as dividers in the pan.
- a cardboard box approx. 4 ft. x 3 ft. x 3 ft. to make the **fire arch**. Paint the box black and cut a door in the front. Place your evaporator pan on top of the fire arch *(see photo at left)*.
- corks, packing peanuts, or some other material to represent sap. It won't flow like liquid sap, but children love collecting and "pouring" these sap substitutes.
- tree stump drilled with holes, extra taps, small buckets, kid-sized hammers
- ***At Grandpa's Sugar Bush*** by Margaret Carney

Directions

1. Read *At Grandpa's Sugar Bush* by Margaret Carney. Ask if any children have been to a sugar house. Do any of their families sugar?
2. Explain what is set up in the classroom—a sugar house! There is an evaporator pan with the fire arch under it, the wood, clothing, and tools to be a sugarmaker.
3. Before getting started, play the K.I.M. ("Keep in Mind") game (read the following instructions or see Appendix, p.238). Lay all the sugaring tools out on a table or floor. Cover them with a cloth. Explain that there are tools under this cloth that sugar makers use to make maple syrup. Some will look familiar, many will not. The cloth will come off and each child is to look closely and take a mental picture of all the tools. The cloth goes back on and the fun begins! How many of the tools can the children identify? List and keep count of the items as they are mentioned. Once they've exhausted their memories, remove the cloth once again and go through the list to

K.I.M. game: sugarmaking tools

identify the tools and how they are used. Ask the children what they think are the steps for making maple syrup. Help them create a sugar making story that they can act out, then encourage the children to role-play making maple syrup.

4. While the children are role-playing, station yourself by an old tree stump that has tap holes drilled into it. Have children practice tapping a tree by using a small hammer to insert old taps (or "spiles") into the holes on the stump and hanging small buckets on the taps.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- How do you make maple syrup?
- What are the steps, in order?
- What happens to the sap when it's heated up in the evaporator?
- Do you like maple syrup? What is your favorite way to eat maple syrup?
- Can you think of any other foods that come from trees?

Extensions

- Set up your water play table with tubing line, funnels, plastic cups *(see above photo!)*
- Use the "Sugaring Tools Cards" (Appendix, p.241) as sequence cards, to match to actual tools, or as prompts for writing stories
- Maple syrup taste testing: Have samples of real maple syrup and several samples of imitation maple syrup. If you check the labels of many commercial brands, you'll find that they actually have no maple syrup in them but rather corn syrup, high fructose corn syrup, caramel coloring, and "natural" flavors. Using coffee stirrer sticks or small spoons, have each child sample a small taste of each. Graph their responses: Which sample was their favorite? Which samples did they think were genuine maple syrup?
- Take a field trip to see a real sugar house in action.

As an extension, set up your water play table with tubing, funnels, and plastic cups.

Sweet Sugaring

WHAT'S THE **Big Idea?**

Cycles
Change over Time

Materials

- ***Sugarbush Spring*** by Marsha Wilson Chall
- access to sugar maple tree(s)
- early spring weather, when days are above freezing temperatures, but nights dip into freezing
- electric drill
- taps (also called spouts or spiles)
- bucket or plastic container
- soup pot
- candy thermometer
- wool or cotton filter

Tip!

Check **www.leaderevaporator.com** to purchase taps and other sugaring equipment.

Enduring Understandings

- We can impact cycles: Humans can use the water cycle to their benefit.
- Sap, consisting mainly of water, can be changed into sweet syrup by heating the sap to evaporate most of the water.

Objectives

- Children demonstrate an understanding of the sugaring process.
- Children show interest and curiosity about the water cycle.
- Children discover what happens to sap when it is boiled.

Directions

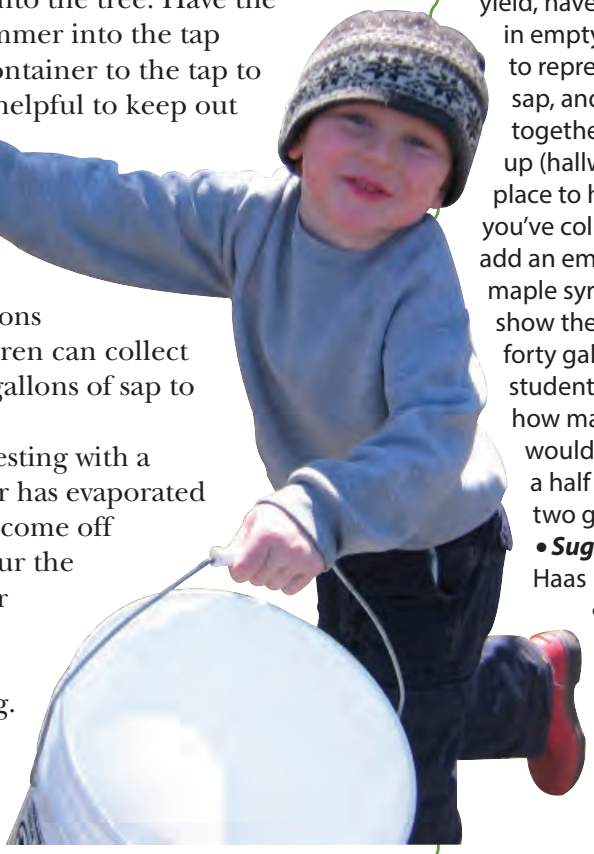
1. Ask the children, Have you ever tasted maple syrup? Do you know where we get maple syrup? Discuss the changes in the weather that signal its sugaring time, as winter turns into spring. Cold nights and warm days are a signal for the sap in trees to start moving.
2. Read *Sugarbush Spring* by Marsha Wilson Chall and talk about what had to happen to make maple syrup.
3. If possible, tap a sugar maple tree in your schoolyard. Trees that are 31–53 inches in circumference can safely take one tap, 54–75 inches 2 taps, and over

Sap Facts

- All trees have sap but the sugar maple has a higher sugar content than other trees. Red maple and birch trees are also tapped by some sugarmakers.
- How can you tell if a tree is a sugar maple? Sugar maples have opposite branching. This means they have branches and buds directly opposite each other on a limb (unless a branch has broken off). There are four tree species that share this characteristic of opposite branching: maple, ash, dogwood and horse chestnut. Foresters call them the "MAD HORSE" trees. ("MAD"' contains the first letters of the names of maple, ash and dogwood.) Once you have identified a tree as MAD, look at the bark to determine if it is a maple. Maple trees have long, irregular plates of grey-to-brown bark that lift along one edge. Also, the sugar maple's winter buds are sharply pointed, conical and brown in color.
- Sap is 98% water and 2% sugar and minerals and nutrients. It takes an average of 40 gallons of sap to make 1 gallon of maple syrup!
- Once leaves start to bud, sugaring is over as the taste of syrup is "off".

75 inches, 3 taps. An electric drill with a 7/16 or 5/16 drill bit can be used to drill a hole 2–2 ½ inches deep into the tree. Have the children gently tap the spiles with a hammer into the tap holes. Secure a bucket or plastic container to the tap to collect the sap. Lids are helpful to keep out the snow and rain. (You don't need more water!)

4. Collect sap. You are at the mercy of nature so you need to be flexible. If the sap is really flowing, try to collect at least several gallons and start sugaring with your class. Children can collect the sap. Remember it takes around 40 gallons of sap to make one gallon of syrup!
5. Boil the sap in your soup pot at 219°F, testing with a candy thermometer. Once enough water has evaporated off, you'll know it's syrup because it will come off a ladle in a sheet (see photo, p.150). Pour the hot syrup through a wool or cotton filter to remove the *niter*, or sugar sand, that naturally occurs when boiling sap. Store your syrup in the refrigerator until using.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.



Line up 40 empty gallon jugs to visualize how much sap it takes to make one gallon of syrup!

Extensions

- To get a sense of the volume of sap to syrup yield, have students bring in empty gallon milk jugs to represent gallons of sap, and string them together and hang them up (hallways are a great place to hang them). Once you've collected 40 jugs, add an empty gallon jug of maple syrup to the wall to show the yield from the forty gallons of sap! Have students try to figure out how many gallons of sap would be need to make a half gallon of syrup, two gallons, etc.
- ***Sugaring*** by Jessie Haas
- Have a pancake or waffle breakfast to use your homemade or bought maple syrup.

continued

"Sheeting" shown here, indicates that sap is now syrup!

- Use the "Sugaring Tools Cards" (Appendix, p.241) as sequence cards, or match to actual tools, or as prompts for writing stories
- Maple syrup taste testing: Have samples of real maple syrup and several samples of commercial maple syrups. If you check the labels most of the commercial syrups have no maple syrup in them but rather corn syrup and high fructose corn syrup with caramel coloring and "natural" flavors. Using coffee stirrer sticks or small spoons have each child sample a small taste of each. Graph results for favorite and/or which is "real" maple syrup.
- Take a field trip to see a real sugar house in action.

Discussion Questions

- Where does maple syrup come from?
- How do we get the sap out of the trees?
- How does the syrup turn into sap?
- Why do we only make maple syrup in the late winter

Maple Math

The number of gallons of sap needed to make a gallon of syrup varies with the sugar content of the sap. Using a special instrument called a **refractometer**, a sugar maker can determine the percent of sugar in a maple tree's sap. (The average for maple trees is 2%.) Then, using the **Jones Rule of 86**, the sugar maker simply divides 86 by the % sugar to calculate the amount of sap needed to produce a gallon of syrup.

What makes sap run?

Sap flows through a portion of the outer tree trunk called sapwood. Sapwood consists of actively growing cells that conduct water and nutrients (ie. sap) from the roots to the branches of the tree. During the day, activity in the sapwood cells produces carbon dioxide (CO_2) gas, which is released into the spaces between the cells. Additional CO_2 dissolved in the cool sap is also released into the intra-cell spaces as the day warms up. This release of CO_2 causes pressure to build up in the cells. A third source of pressure is called *osmotic pressure*, which is caused by the presence of sugar and other substances dissolved in the sap. When the tree is wounded, like when a tap is hammered into it, the pressure pushes sap out of the tree. At night or when temperatures go below freezing, the CO_2 cools and contracts, and some becomes dissolved in the cooled sap again. Also, some of the sap freezes. All three of these factors create suction in the tree, which causes water from the soil to be drawn up into the roots and travel up through the sapwood. When temperatures rise above freezing the next day, sap flow begins again.

Source: Cornell University Extension: **http://maple.dnr.cornell.edu/FAQ.htm**

Water Goes Up and Down

WHAT'S THE **Big Idea?**

Cycles Change over Time

Enduring Understandings

- Water follows a cycle: liquid, solid and gas.
- Humans can impact a natural cycle.

Objectives

- Children demonstrate an understanding that water goes through phases of a cycle: liquid, gas and solid.
- Children show interest and curiosity in how the water cycle operates.
- Children discover how to make it rain.
- Children play with motions and dance to explore the water cycle.

Directions

1. Read *The Water Cycle* by Helen Frost.
2. Observe the water cycle in action! If possible, visit a sugar house in operation to watch the steam rise off the evaporator pan, condense on the metal roof and feel it drop on your head as rain. If there is not a sugar house to visit, boil water in a medium-sized pan. As the steam rises, hold a cold ceramic plate above the steam. Have children

Materials

- ***The Water Cycle*** by Helen Frost
- a visit to a working sugar house. If this is not possible you can use a pot of boiling water and a cold ceramic plate.

Extensions

- With older children, have them think of experiments where they could show the water cycle in action.
- Using watercolor paints, paint pictures of the water cycle.
- Play in the rain, jump in puddles, make snow angels.
- Observe a puddle during a sunny day, take a photo of it and document its progress as it evaporates into the air and/or percolates into the ground.
- ***Water Dance*** by Thomas Locker

The Water Cycle Dance

(Chant:) The water cycle goes round and round *(move your arms in a large circle over your head)*
The water cycle goes up and down *(move your arms and body up and down)*

EVAPORATION: *Say the word slowly as you start kneeling down and then slowly, waving your arms into the air, rise to standing. Repeat several times.*

CONDENSATION: *Again, saying the word slowly as you puff out your cheeks, raise your arms to make a huge circle above your head to represent a cloud.*

PRECIPITATION: *Say the word quickly, playfully as your hands and arms fall up and down like rain, louder and faster if the rain comes harder, light and daintily if its snowing.*

PERCOLATION: *Slowly repeat the word as you kneel on the ground, forming a puddle of water that will slowly seep into the ground to be evaporated once again.*

Repeat several times getting into the motions and "drama" of the water cycle!

carefully gather around to watch the steam condense into water that will drop back into the pan as "rain."

3. After visiting the sugar house, or watching the boiling water rise off a pot, do "The Water Cycle Dance" (see box above).
4. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Where else do you see evidence of the water cycle in action? (For example, a tea kettle boiling, melting snow, rain, a mud puddle, etc.)
- What does water look like when it's a solid? When it's a gas? When it's a liquid?
- What makes the water change from a liquid to a gas? From a liquid to a solid?
- How do people turn water into a solid?

Chicken Little

WHAT'S THE **Big Idea?**
Cycles

Enduring Understandings

- Cycles have no beginning and no end; they are continuous.
- Chickens come from eggs; they are *oviparous* which means that they lay eggs that hatch outside their body.
- A rooster needs to mate with a hen in order for an egg to be fertilized. That egg must be incubated by the hen or artificially in an incubator for 21 days for the chick to develop.
- Hens will lay eggs even without a rooster, but the eggs won't produce chicks.

Objectives

- Children demonstrate an understanding of the sequence of the chicken's life cycle.
- Children show interest and curiosity in how an egg develops into a chick.
- Children discover that all living things need care, air, water and food.

Directions

Prepare your space to raise the chicks. Set up a calendar where students can mark each of the 21 days of the chicks growth. Set up the incubator. Let it run to test the temperature before putting in the eggs. Incubators come with directions for setting up and testing the machine.

1. Read *Where Do Chicks Come From* by Amy Sklansky to your students. Discuss the life cycle of a chicken. Talk about the responsibilities of raising chicks. Ask your students if they want to raise some chicks. Ask if they are willing to make a commitment to raising the eggs.
2. Have your students map out the life cycle of the chicken using the "Chicken Life Cycle Cards." Encourage students to write a story to go with the life cycle.
3. Show the students the eggs. Place the eggs in the incubator. If you do not have an automatic egg turner, the eggs need to be turned three times a day: when you get to school, at noon, and before you leave. With a pencil, place an X on one side of the egg so you can keep track of which eggs you've turned to which side. (These directions come with incubators and there are many sources online with more in-depth details.)

Be prepared!

Hatching Chicks?

Before deciding to try to raise chicks from eggs with your students, make sure you're aware of the commitment it will take on your part as the teacher. Eggs need to be turned three times a day, even on weekends, and need to be kept at a specific temperature. Chicks also grow very quickly and will need a home in three to four weeks after hatching. You should have homes in place before you buy the eggs. Finally, not all of the eggs may be viable. Chicks may not hatch from each egg, or chicks may hatch but not live. There are many powerful and valuable life lessons to be learned from raising chicks from eggs, and it is always worth the work. But think hard about it first!

Materials

- ***Where Do Chicks Come From*** by Amy E. Sklansky
- incubator
- automatic egg turner, optional *(This saves you from coming in on the weekend to turn the eggs.)*
- fertilized eggs
- red heat lamp
- pine shavings *(NOT cedar shavings, which cause respiratory problems for chickens)*
- chick waterer
- chick feeder
- chick starter feed
- calendar to keep count of the 21 days to hatching
- "Chicken Life Cycle Cards," Appendix, p.243

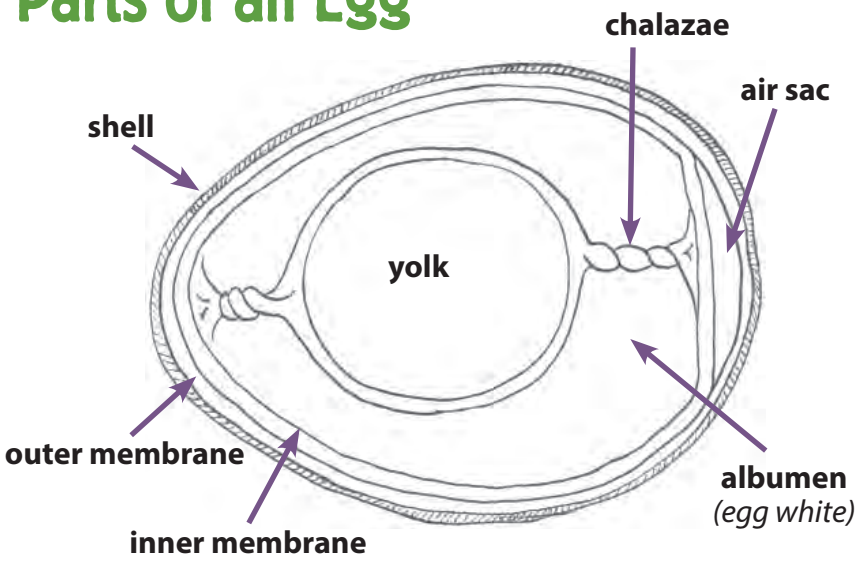
Visit a local farm or feed store, or check an online retailer like **www.mypetchicken.com** for hatching supplies, fertilized eggs and reliable information.

Extensions

- Crack open a store-bought egg for the children to see its parts (see graphic below).
- ***Eggs and Chicks*** by Fiona Patchett
- ***Egg to Chick*** by Millicent Selsam
- ***Chicks and Chickens*** by Gail Gibbons
- ***Dora's Eggs*** by Julie Sykes. How are the other farm animal babies like the chicks?

4. After seven days, use a strong light to "candle" the eggs to determine if they are fertilized and developing. Hold the egg over a toilet paper roll while shining the light from below. The eggs are translucent and allow the light to go through the shell, illuminating developing blood vessels and the eyes. Candle again after 10–14 days, and you'll only see a dark mass if the chick is developing according to schedule. If the egg is not developing, compost it.
5. As the due date nears, set up a big box with pine shavings, a red heat lamp, an appropriate chick waterer, and a feeder. Get ready for your new arrivals!
6. Throughout the experience, process and reflect on what's happening with the children by engaging in a conversation guided by the discussion questions.

Parts of an Egg



Discussion Questions

- What other birds and animals hatch from eggs? *Chickens Aren't The Only Ones* by Ruth Heller is a great introduction to the many creatures that hatch from eggs.
- What does the egg need to grow?
- What will the baby chicks need to survive?
- What were you able to do as an infant? What will the chicks be able to do when they are born?

See-Through Germination

WHAT'S THE **Big Idea?**
Cycles

Enduring Understandings

- Plants have a life cycle.
- Most plants begin their life cycle as a seed.
- Not all seeds look the same.
- Seeds need water, air, sun (warmth), space, and soil to grow.

Objectives

- Children show interest and curiosity about the growth of a seed.
- Children discover firsthand the beginning of a plant's life cycle.
- Children experiment with how a seed grows.

Materials

- pumpkin seeds
- lima bean seeds
- rubber bands
- clear cups, ideally one per child
- paper towels
- water
- plastic wrap
- large ziplock bag

Directions

Consider doing "Fab 5" in *Who Are We,* (p.75) prior to this experience.

1. Ask children if they know the five things a plant needs to grow and survive: water, sun, air, soil, and space. Ask if they know where a plant comes from: starting as a seed, a plant begins to grow when the conditions are right. Tell them that the start of growth in a seed is called *germination.* Explain that they are going germinate seeds and see what happens!
2. Give each child a cup and some paper towels (another option is to use a large plastic ziplock bag instead of the cup). Wet the paper towels and stuff them into the cup.
3. Distribute the seeds to the children: two of each seed variety. Show the children how to stick the seed down the side of the cup, between the paper towel and the cup, so that the seeds are visible from the outside.
4. Cover each cup with plastic wrap and secure with a rubber band. Label each cup with the child's name

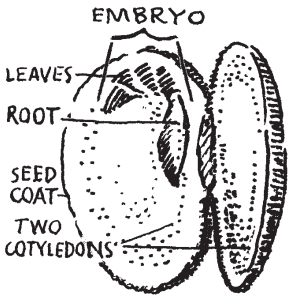


Diagram of a Seed

Seed Coat: The outer covering that protects the seed.

Cotyledons: Large fleshy structures that form the bulk of the seed. They are stored food that the plant uses to start growing.

Embryo: Located along the inner curve of the cotyledon. This is the tiny plant, made up of the first leaves and root.

Roots: The fine structures that will extend downward into the soil to anchor the plant and take in water and minerals to help the plant grow.

Leaves: Will absorb sunlight to make food for the plant.

Illustration: Project Seasons

Extensions

- ***A Seed Is Sleepy*** by Dianna Hutts Aston
- ***How A Seed Grows*** *(Let's-Read-and-Find-Out-Science 1)* by Helene J. Jordan
- Take the seed that germinated and transplant it into soil. Continue to document its growth.
- Have each student plant a bean seed in a cup of soil and observe what happens as the plant continues to grow once it has sprouted. Compare that growth to their seed germination experiment.
- Experiment with other seeds. Do they all grow the same?

and place them in a well lit or sunny spot, like a windowsill.

5. Make daily observations and have the children draw what they see each day for about a week. Once your seeds have sprouted, take off the rubber band and remove the seeds. Have students observe and draw this stage of the seed sprouting.
6. Ask children if they know what is inside the seed. Have each student peel off the shell/seed coat. What do you see? Can you identify all of these parts on your seeds? Explain that the germination process that they have been observing over the past week or so is the same thing that happens when a seed is planted in the ground. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- How could the seed germinate without soil?
- What else did the seed need to germinate?
- What will happen to the germinated seed next?
- What else can we do with seeds besides germinate them into plants? (eat them, feed them to animals, use them in art projects)

Soil Recipe

WHAT'S THE **Big Idea?**
Cycles
Change over Time

Enduring Understandings

- The natural forces of air and water break down rocks, minerals, and organic materials to create soil.
- Soil is necessary to grow plants to eat and use in other ways.

Objectives

- Children demonstrate an understanding of the elements that make up soil.
- Children experiment with creating soil.
- Children play with different types of soil.

Directions

1. In the schoolyard, woods or garden, sit down and dig up a handful of soil. Alternatively, in the classroom pass around a baggie filled with soil. Pass it around to the children, have them smell, look at, and feel what is in this sample of soil. List and discuss their findings. Discuss why we should even care about soil. Why is soil important?
2. Pass around a cloth or paper bag filled with a variety of objects (see materials above.) Everyone should take one object from the bag. If you have more students than objects, have pairs of children take one object.
3. Have the children think about their objects and ask if they came from soil. As students think about each item, they should be able to connect the item in some way to soil. Even if it did not grow from soil, such as the wool glove, the wool that made the glove was shorn off a sheep that ate grass that grew in the soil! A connection!
4. After making these connections and acknowledging the importance of soil in our daily lives, read *Jump into Science: Dirt* by Steve Tomecek. Discuss what elements make up soil.
5. Challenge the students to help you create ten pounds of soil to add to Mother Earth's top layer. They should go off to look for the ingredients to "cook up a batch" of rich soil for either the garden, woods, or schoolyard. Recall the elements of soil from the book you just read if they are unsure what to look for.
6. When students return, lay the ingredients down on the ground (or in a bowl if you are in the classroom). Is there enough mineral material, air, water, organic matter? Pull out the "Soil Recipe Cards" to check if all the necessary ingredients are here. (Do not show the clock card yet.) If all the ingredients are here, why

Materials

- bag filled with everyday objects including but not limited to: apple, small bag of hay, pencil, wool glove, can of peas, cotton t-shirt, leather belt, empty potato chip bag, metal spoon, empty cereal box, small notebook, milk carton, maple syrup, candy bar wrapper
- ***Jump into Science: Dirt*** by Steve Tomecek
- "Soil Recipe Cards" (Appendix, p.254), or draw your own pictures of: a clock, a drop of water, worms and insects, the sun, bacteria, the wind

Soil Ingredients

45% minerals
25% water
25% air
5% is organic matter

Extensions

- Have children bring in samples of different types of soil from home to the classroom for students to examine. Compare the samples. What is common to all of them?
- Create a soil tunnel in your classroom to enable students to "go underground" to witness what lives below the soil.

As an extension of this activity, create a soil table with an "underground tunnel" where students can "go underground" to witness what lives below the soil.

doesn't look like soil? What needs to happen? Students may want to add more water, crumble the dead leaves or sticks or go find more worms to add to the batch. Is it soil yet?

7. Pull out the clock card for the most important ingredient of all: time! It can take 50 to 100 years to make an inch of topsoil. Discuss the small changes that would have to take place over those years to turn our pile of ingredients into soil.
8. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- How do the minerals change over time? What happens to them? What causes the change?
- Why does it take six weeks to make compost but 50 to 100 years for nature to make soil?
- Why doesn't all soil look the same?

Welcome Back!

WHAT'S THE **Big Idea?**
Cycles
Change over Time

Enduring Understandings

- Every year some animals leave one place to find food in another place.
- Some animals have summer homes for nesting and migrate to different winter homes to find food.

Materials

- ***The Goose Story*** by Cari Best or ***The Way Home*** by Nan Parson Rossiter

Objectives

- Children show interest and curiosity why some animals migrate.
- Children role play the movement of geese throughout a yearly cycle.

Flying in a V-formation makes it easier for migrating birds to travel long distances and communicate with each other.

Directions

1. A sure sign of spring in the northeast is the return of the Canada geese to their nesting habitats. As part of *What's Happening?*, share with students that some animals in your community live there only part of the year and migrate to warmer locations in the colder months. If you live in a warmer climate, you might discuss the animals that migrate to your area in the winter. (For more background information, check out "A Winter's Meal" in *Who Lives Here?* p.108.)
2. As spring begins to arrive, start a list of changes in your community: warmer days, children needing less clothing, the melting of snow (if it snows in your area), bulbs starting to poke out of the wet soil, or the honking of returning Canada geese. Another sign of spring happens during the first, cold, rainy spring night when salamanders leave their wooded habitat to migrate to a nearby pond.
3. Read *The Goose Story* by Cari Best, or *The Way Home* by Nan Rossiter. Both tell a story of an injured goose that cannot migrate with its flock. Discuss how humans intervened in the book to help the injured birds.
4. Ask your children if they have ever seen the geese flying in a V-formation. Did they hear the geese? Can they make the sound they heard? Most likely you will only hear honking sounds. Explain that the male geese make a deep "a-honk" sound but the females make a higher "a-hink" sound! You must listen carefully to hear the difference. When the geese are flying, the sounds are used to help keep the leader moving at the same speed.
5. Discuss why geese travel in a V-formation. Scientist have determined that this shape makes it easier for the birds to fly long distances and to communicate with each other.

Safe on the ground, children mimic the V of flying geese.

6. On your next walk, bring along a rope. Have children hold on to the rope and form a V-shape. Choose a leader of to hold the V but remind them, geese take turns leading. (That sounds familiar!) As the flock flies, remind them of the sounds the males and females make as they fly. "A-hink, a-honk, a-hink, a-honk"-ing along on your walk!
7. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Can you think of any other animals that migrate?
- Why do geese and other animals migrate?
- Do you ever leave your community? Why?

Extensions

- ***Big Night for Salamanders*** by Sarah Marwill Lamstein
- ***Salamander Rain: A Lake and Pond Journal*** by Kristen Joy Pratt-Serrafini
- Discuss the instinctive spring movement of salamanders. Visit a pond in early spring to see if you can find any evidence of the salamanders. The most obvious will be eggs floating in the pond. We recommend that you leave the egg masses in the pond to follow their natural life cycle.

Another Welcome Back

Salamanders are another animal that we welcome back in the spring (although they never really leave). In the spring, these amphibians emerge from their home in the woods and instinctively make their way to a vernal pool or pond to mate and lay their eggs. Then they return home. The first rainy spring night with temperatures in the forties is the signal to begin their trek to the water. In some areas, people organize to help the salamanders move safely across known crossing spots. They put out cones to slow down traffic and will even physically move the creatures safely across the road! This happens at night, so you may not be able to attend with your class, but you can let families know about this annual event.

Worm Delight!

WHAT'S THE **Big Idea?**
Cycles Change over Time

Enduring Understandings

- Worms help to aerate the soil, which is helpful to plants.
- Worm castings help to fertilize the soil.
- Worms can change the landscape over time.
- Worms have a life cycle.

Objectives

- Children demonstrate an understanding of the life cycle of a worm.
- Children show interest and curiosity about how worms impact the soil.
- Children experiment with worms and their reaction to light and water.
- Children explore worms, looking for adult worms and worm eggs.

Directions

SET UP: Place worms on trays; cover them with a wet rag so they do not dry out. Set out several popsicle sticks to move the soil and worms, as well as magnifying lens and boxes.

1. Read *Wiggling Worms at Work* by Wendy Pfeffer to your class. Discuss the role of the worm in helping gardeners. Ask your students, "Who has seen worms? Where do you find them? What were they doing?"
2. Explain that students will have the opportunity to observe worms and look closely at them to identify body parts. They will have an observation sheet to help them identify worm body parts and worm eggs.
3. Divide your students into smaller groups and assign them a tray to explore. Encourage them to be gentle and move the soil and worms with care.
4. Have students use the "Worm Exploration Sheet" to help them record their observations. After students have had about fifteen minutes to observe, distribute spray bottles and flashlights for experimentation on how the worms react to these stimuli.
5. Process and reflect on the experience with the children in a conversation guided by the discussion questions.

Discussion Questions

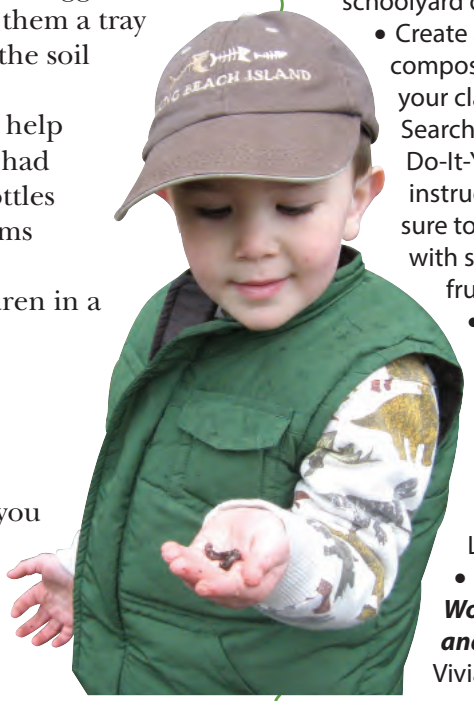
- What did you notice?
- Describe the different stages of the worm's life that you found.
- How did the worms respond to light? To water?
- Name three words you would use to describe a worm.
- What are you wondering now?

Materials

- If possible, purchase some red wiggler worms. (Check online.) Red wigglers are not the worms in your garden, they are special worms that eat home food scraps. You then harvest the vermicompost as fertilizer for gardens. If you cannot obtain red wigglers, collect earthworms from your soil.
- ***Wiggling Worms at Work*** by Wendy Pfeffer
- "Worm Exploration Sheet" (Appendix, p.242)
- magnifying glasses or bug boxes
- trays
- popsicle sticks
- spray water bottles
- flashlights

Extensions

- Look for earthworms during walks in the schoolyard or woods.
- Create a worm composting box in your classroom. Search online for Do-It-Yourself instructions. Make sure to cover all food with soil to keep fruit flies at bay.
- ***Garden Wigglers: Earth-worms in Your Backyard*** by Nancy Loewen
- ***Yucky Worms: Read and Wonder,*** by Vivian French



Flower Power

WHAT'S THE **Big Idea?**

Cycles

Materials

- ***The Reason for a Flower*** by Ruth Heller
- Day lily or other simple flowers such as tulip, magnolia, or azaleas, one for each child or pair of children
- diagram of the parts of a flower (Appendix, p.243)
- magnifying lenses for up-close investigating
- index cards

Enduring Understandings

- Flowers go through a life cycle starting with a seed.
- Flowers help plants to grow.

Objectives

- Children demonstrate an understanding of the purpose of a flower.
- Children show interest and curiosity about the parts of a simple flower.

Directions

1. Ask the children what a flower is. Why do plants have flowers? Have you ever looked really closely at a flower?
2. Read *The Reasons for a Flower* by Ruth Heller. After reading, discuss the purpose of the flower.
3. Explain that today they will become flower scientists! They'll look very closely at a flower and even get to take it apart to discover all of its different pieces and their purposes.

4. Give each student or pair of students a flower and a diagram of a flower's parts. Ask them to just look at the flower for right now and see what parts they can see.
5. First locate the **stem.** Ask children what its purpose is (to hold up the plant and give it strength). Next find the **leaves** and ask what their purpose is (to capture the sunlight to make food for the plant). Pull the leaves off of the stem and set them aside.
6. Instruct the children to find the **sepals**, and gently pull them off of the flower and lay them on an index card. How many are there on your flower? Different kinds of flowers have different numbers of sepals.
7. Ask the children, "Where are the **petals** of the flower?" Tell the children to pull off the petals carefully so they don't disturb what's in the middle of the flower. Have them lay the petals on another index card and ask, "How many petals did you find?"
8. Distribute magnifying lenses. Show children how to examine the inside of the flower with a magnifying lens. This is the

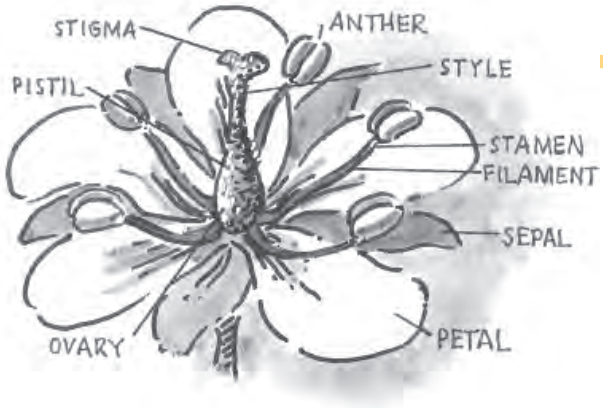


Illustration: Project Seasons

Flower parts & their purpose

Sepal: Outermost layer of the flower. It is often green leaves around the base of the flower, which cover the petals in the bud stage.

Petals: Variously adapted, colored, shaped, and perfumed part of the flower, their purpose is to attract animals to the flower for the purpose of pollination.

Stamen: Male parts of the flower, each composed of a thin filament that holds up an enlarged structure, the anther.

Anther: Full of dusty pollen that is picked up by various pollinators and carried from flower to flower.

Pistol: Hidden among the stamen, there can be one or many pistols depending on the flower type. The pistol is often divided into three parts, the enlarged base—or ovary, the style, and stigma.

Ovary: Where the seeds develop.

Style: Long, thin neck-like section attached to the stigma.

Stigma: Divided, branched or lobed, sticky to catch pollen. Pollen on a stigma leads to seed in a fruit.

ovary, a reproductive part of the flower that makes the seeds after it is pollinated. This can be a short discussion, or lead to a larger conversation about bees and pollination.

9. Have the children find the **stamens** (the male part of the plant with the pollen grains on them) and pull them off. Lay them on another index card. Ask, "What happens to your fingers when you touch the stamen?" The pollen grains stick on your finger just like they would on a bee's knees.
10. Ask, "What's left?" The **pistol,** which is in the center of the stamens. The pistol is the female part of the flower. It is sticky so it can collect the pollen grains from the stamens.
11. Your flower should now be dissected and you can challenge the kids to find the different parts they set aside as you call out the name of the flower parts. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions *(sidebar)*.

Extensions

- Have each child create their own flower by drawing it, cutting out paper and other scraps and glueing it together on a piece of paper, or making a 3-D model trying to include all of the special parts they just learned about by dissecting a flower. Can they think of a special name for their flower? "Plant" their flowers on a Flower Garden bulletin board in the class or in the hallway.
- Go on a flower-find adventure in your schoolyard or neighborhood. Have pairs of children bring a color wheel (Appendix, p.246) and try to find as many different color flowers as possible. Match them to the color wheel. Take a camera with you to document the many colors you find. Use the photos to created a flower book back in the classroom.
- ***Planting a Rainbow*** by Lois Ehlert
- ***Flower Garden*** by Eve Bunting

Discussion Questions

- Did every flower have the same number of parts?
- How does the flower help the plant?
- What insects, birds, or animals have you seen pollinating flowers?

WHAT'S HAPPENING?
SUMMER

Let's Make Pickles

WHAT'S THE Big Idea?
Cycles

Materials

- ***Blueberries for Sal*** by Robert McCloskey
- small jars with lids that have been washed/sanitized in the dishwasher
- ingredients for pickle making (see Recipe Card below)

Enduring Understandings

- Fruits and vegetables are harvested fresh during the growing season.
- Fresh food can be preserved to prevent spoilage so that it can be eaten later.

Objectives

- Children demonstrate the correct way to cut vegetables.
- Children show interest and curiosity where their food comes from.
- Children discover that cucumbers turn into pickles.

Refrigerator Pickles

INGREDIENTS

1 c. distilled white vinegar
1 tbsp. salt
1 c. white sugar
6 c. sliced cucumbers
1 c. sliced onions
1 c. sliced green bell peppers
1 c. celery seed *(optional)*
½ tsp. of dry mustard *(optional)*

INSTRUCTIONS

In a medium saucepan over medium heat, bring vinegar, salt, and sugar to a boil. Boil until the sugar has dissolved, about 10 minutes. Place the cucumbers, onions, and green bell peppers in a large bowl. Pour the vinegar mixture over the vegetables, transfer to sterile containers, and store in the refrigerator.

Directions

Prep the brine with or without your students depending on your kitchen availability. Cooked brine can be stored in a kid-sized pitcher so it is easy for them to pour into the jars.

1. Read *Blueberries for Sal* with your students. Discuss the story with the children; ask them why Sal and her mother were picking blueberries. (To preserve them to eat over the winter, when fresh berries aren't available.)
2. Talk about gardening with students, and the time of year that vegetables and fruit are picked fresh. Ask children if this is the only time that they eat these things. Explain that we are able to enjoy fruits and vegetables all year long through preserving food. If you have experimented with composting (see "Incredible Compost," in *Who Are We?* p.59), talk about what happens to food scraps over time. Explain that preserving food prevents it from rotting and decomposing.
3. Ask the children if they'd like to preserve some food themselves. Show them the cucumbers and other ingredients, and ask if they know what these ingredients make.
4. Have children wash cucumbers. Using kid-safe cutting tools (such as ones you can purchase from www.forsmallhands.com) to chop the cucumbers, peppers, and onions.

Extensions

- Try other pickling recipes such as Dilly Beans (see recipe card on facing page).
- Taste test a variety of pickles such as dill, sweet, bread and butter, and gherkins. Graph children's preferences.

5. Fill the jars with cucumbers, leaving enough clearance on top to cover them with brine. Pour the brine over the cucumbers, and put the top on the jar. Store the pickles in the refrigerator, they will be ready to eat in 3–4 days and will keep for a month.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Where do pickles come from?
- How do you like to eat your pickles?
- Why do people make pickles?
- What other foods do people preserve?
- What foods are fresh in spring? Summer? Fall? Winter?

Dilly Beans

Adapted from a recipe in Edible Seattle

INGREDIENTS

2–3 c. green beans, trimmed
onion, thinly sliced
fresh dill sprigs (2 per jar)
black peppercorns (½ tsp. per jar)
red pepper flakes (⅛ tsp. per jar)
whole clove garlic, slightly crushed (1–2 per jar)

For the brine, which makes enough for a couple of pint jars or one quart jar:
¾ c. white vinegar
¾ c. water
2 tsp. sugar
1 tsp. kosher salt

INSTRUCTIONS

1. Blanch the beans: submerge them in boiling water for about 30 seconds, then transfer them to an ice-water bath until cooled.
2. Pack the green beans, onion, and dill vertically into clean canning jars. Add the peppercorns, red pepper flakes, and garlic.
3. In a saucepan, bring the vinegar, water, sugar and salt to a boil. Remove from heat and pour into the jars, leaving just a little headspace. Cover jars and cool to room temperature, then refrigerate. Beans will be ready to eat in 2–3 days and will keep for months in the refrigerator.

Terrific Trees

WHAT'S THE **Big Idea?**

Cycles
Change over Time

Materials

- ***A Log's Life*** by Wendy Pfeffer
- forest or wooded area, even a stand of a few trees will work
- empty egg cartons
- clipboards for each child made of cardboard, paper attached with binder clip
- pencils, markers, crayons (if children are not carrying their own supplies)
- magnifying boxes and glasses

Enduring Understandings

- All things change, and can adapt to change.
- Change is always happening.
- Cycles have no beginning and no end; they are continuous.
- Trees change over the seasons in the same pattern, year after year.

Objectives

- Children demonstrate that trees are plants and go through growth cycles just as they do.
- Children cultivate an appreciation for trees.
- Children show interest and curiosity about the changes they observe in the tree(s).
- Children play comfortably in the woods.

A Tree by any other name

Seedling: A tree less than 2 inches in diameter

Sapling: A small tree 2–4 inches in diameter at breast height

Pole: Trees 5–7 inches in diameter at breast height

Mature Tree: A tree greater than 7 inches in diameter at breast height.

Directions

It can be helpful for children to develop their "owl eyes" (see p.131) prior to beginning this experience.

1. Read *A Log's Life*. Give children time to look at the pages to see how much is going on in the log. Prepare them for a trip to the woods by creating guidelines for being in the

woods. (See p.41 for tips on creating guidelines for outdoor experiences with children.)

2. As you are about to enter the woods, stop and whisper that these trees have many stories to tell but we need to be ready to hear and "read" them. Tell children to use their "owl eyes" as they look carefully, listen, and reflect on what they've observed. Then we'll have stories to share!
3. Once in the woods, allow children time to explore. Get down on the ground with them as they look for seeds, animal homes, and leaves.
4. Help find and identify a seedling, sapling, pole and a mature tree. As you are walking through the woods, call out "sapling" and help everyone find a sapling, one hand should be able to wrap around one. Find a mature tree to hug (a mature tree takes two or more arms for a hug).
5. Look for a downed tree such as the one in the story. If you can find one, look for many of the creatures that were in *A Log's Life*. Use the magnifying boxes to exam the creatures.
6. If the tree is rotting and its wood is easily crumbled, bring some back in order to make paper. (See "Paper Making," in *How Are We Connected*, p.206.)
7. Children should find a special spot to sit in alone during this time in the woods. Have the children find their spot and sit there with their journals. Tell the children to draw or write about a tree they can see from their spot.
8. Process and reflect on the experience with the children by sharing the "stories" children found in the wood, and engaging in a conversation guided by the discussion questions.

Tree Song!

Sung to the tune of "Head, Shoulders, Knees, and Toes"

Children stand like trees, hands in the air, feet rooted in the ground as they sing:

Roots, trunk, branches and twigs,
(Branch and twigs),

Roots, trunk, branches and twigs,
(Branch and twigs),

And buds that turn into leaves!

Roots, trunk, branches and twigs,
(Branch and twigs!)

Discussion Questions

- Tell me about your tree.
- What did you notice?
- How many different types of trees did you see?
- What else did you notice with your owl eyes?
- What do you think this place will look like in the fall/winter/spring/summer? What will be different? What will be the same?

Extensions

- ***Be a Friend to Trees*** by Patricia Lauber
- ***A Tree Is A Plant*** by Clyde Robert Bulla.
- ***My Mother Talks to Trees*** by Doris Gove
- Collect seeds in the woods. See "Seed Hunt and Sort," p.143.
- In the woods or back in the classroom, put the "Tree Life Cycle Cards" (Appendix, p.245) into the correct sequence. Have children work in small groups to put the cards in order, then write a story about the tree's life cycle.
- Another option: add a string to each Tree Life Cycle card. Place a card around a student's neck so the card hangs on the student's back, visible only to others. When the cards are passed out, those with cards must put themselves in order even though they don't know what stage is on their back. Once the group feels they are in the correct order, the students without cards can tell the story of a tree's life cycle and let the other students know if they were correct in their ordering of the story. Another option is to have the students with cards on their back not be able to talk. They must put the story in order without talking and use other means of communicating to complete the task.
- Return to this place often, asking children to return to their personal sit spots. Have the journal about what's happening right now. Compare this visit to previous visits and talk about cycles and changes.

Water Babies Match Up

WHAT'S THE **Big Idea?**
Cycles
Change over Time

Materials

- ***Tale of a Tadpole*** by Barbara Ann Porte
- "Pond Animal Cards" *(adult & baby)* (Appendix, pp.249-250)

Extensions

- Think of other insects or amphibians that go through metamorphosis. Draw pictures of their juvenile and adult forms to create another matching game.
- Children bring in pictures of when they were younger; how have they changed?
- Display baby pictures and try to identify each other.
- ***From Frog to Tadpole*** by Wendy Pfeffer
- ***Pond Circles*** by Betsy Franco

Enduring Understandings

- Many pond babies do not look like their parents.
- Their juvenile body is very different from the adult body.
- Metamorphosis is the dramatic and profound change in appearance from an immature form to a mature form.
- Most insects and amphibians go through metamorphosis.

Objectives

- Children show interest and curiosity in how insects and amphibians of the pond change over time.
- Children learn that metamorphosis means big changes in appearance.

Directions

Consider completing "Pond Critters" in *Who Lives Here?* (p.113) prior to this experience.

1. Read *Tale of a Tadpole* by Barbara Ann Porte. Discuss the metamorphosis of the tadpole into a frog.
2. Explain that other animals and insects go through metamorphosis but many do not.
3. Introduce the "Baby and Adult Pond Animal Cards." Ask children to name the insect or animal on each card.
4. Mix up the cards, lay them face down, and explain the matching game. One child at a time picks up two cards in an attempt to match the baby with the adult. If they match, the child gets another turn. If not, the next child takes a turn.
5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

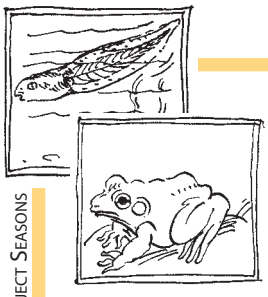


Illustration: Project Seasons

Metamorphosis

For some creatures, the change from birth to adulthood is dramatic. This change in form is called *metamorphosis*. Many insects, including butterflies and mosquitoes, experience **complete metamorphosis**. First, they hatch from eggs into *larvae*, whose primary purpose is to eat and grow. When the larvae reach a certain size, they form into *pupae*. Inside the pupae, complex changes rearrange the creatures' whole body structure, and they emerge looking nothing like their former selves. Other creatures, like frogs and dragonflys, experience **incomplete metamorphosis**. They do not go through the pupae stage, but slowly change from a tadpole or nymph into their adult form.

Discussion Questions

- What did you look like when you were born? Did you have the same body parts you do now? How have you changed?
- Do all animals (insects, amphibians) look the same as babies and adults? What about a butterfly? A frog?
- Why do animals and insects go through metamorphosis?

How Are We Connected?

How Are We Connected? cultivates an awareness and appreciation of what sustains us: our food, fiber, and relationships. This Thread provides an opportunity to deepen our connection with our local food system. Beginning with our air, soil, water, and space, we begin the exploration of food, fiber, family and friends. We weave, knead, bake, and create products that we use and eat, and discover the joy of living with gratitude and in relationship to the world around us.

- **Community:** A group of living and nonliving things sharing a common purpose or space.
- **Interdependence:** All living things are connected. Every organism, system, and place depends on others.
- **Cycles:** Every organism and every system goes through different stages.
- **Change over time:** All organisms, places, and systems are constantly changing.

Enduring Understandings

- All living things have needs.
- Food comes from nature, from plants and animals.
- We need food to live, fiber to keep us warm, and relationships with other living things to feel connected (to make us happy).
- We rely on each other and other living things to meet our needs.
- Knowing where our food and fiber come from is important to understanding the relationship between humans and the natural world.
- There are some things that we need to live (food, shelter, air, water, community), and other things that we don't need to live, but they make our lives more enjoyable.

Connecting beyond the Classroom

Family Connections

Food naturally brings people together. There are many ways of sharing food to strengthen family-school relationships: host a potluck, have a "school lunch for dinner" event, bake breakfast items with the children and host a brunch for families, or offer family cooking nights (this can be a great opportunity to partner with local chefs or grocery stores). Another way to connect with families might be to host a gardening event, or fiber-craft night (knitting, crocheting, felting). Be sure to communicate

Dear Families,

We are so excited to be embarking on an exploration of **How Are We Connected?**

We wanted to share our plans with you so that you might discuss what we are learning with your child. For this study, the question "How Are We Connected?" will guide us as we explore our food, fiber, and relationships.

Our goal is to help your child develop an understanding of and appreciation for where our food and fibers come from. They'll learn about the ideas of **community**, **interdependence**, **cycles**, and how all things **change over time**. In the process, they'll come to understand:

- All living things have needs.
- Food comes from nature, from plants and animals.
- We need food to live, fiber to keep us warm, and relationships with other living things to feel connected (to make us happy).
- We rely on each other and other living things to meet our needs.
- Knowing where our food and fiber come from is important to understanding the relationship between humans and the natural world.
- There are some things that we need to live (food, shelter, air, water, community), and other things that we don't need to live, but they make our lives more enjoyable.

Here are some suggestions to extend this focus at home:

- Prepare food with your children, whether you make favorite family recipes or create new dishes.
- Plant a small garden or window box with your child.
- Take you child with you when you shop for food or clothing and talk about where these items come from.
- Visit a local farm.

Thank you!

WHAT'S the "BIG IDEA?"

Community: A group of living and nonliving things sharing a common purpose or space.

Interdependence: All living things are connected. Every organism, system, and place depends on others.

Cycles: Every organism and every system goes through different stages.

Change over time: All organisms, places, and systems are constantly changing.

to families about the Thread, its Essential Question and Big Ideas, so that families can extend the conversations at home. Many families already prepare food together with their children and might enjoy the opportunity to deepen the experience through connecting to the child's experiences at school. Provide suggestions on conversation topics for the family dinner table.

Service-learning Opportunities

Food and fiber are basic human needs, though not all members of our communities have what they need. Children can contribute to improving the quality of life for all in the community through gleaning (a second harvest for donation, picked after the main crop has been gathered), or "growing a row" in the school garden specifically designated to donate. Another option is organizing a clothing drive, which may be donated to an outside organization or may be intended for school use, such as a winter clothing drive. All children can participate in advertising the drive and sorting or organizing donated items.

The Sustainability Academy organized a winter clothing drive as a service-learning project.

Community Connections

How Are We Connected?, with its core Big Idea of interdependence, is focused on understanding and developing the relationships between all members of a community and meeting our needs through these community connections. Take children into the community to see where people get their food, whether it's your local farmer's market, grocery store, or corner convenience store. Map these locations with children on your Learning Wall. If you are fortunate enough to have a local farmer's market operating during school hours, take a field trip and meet the farmers. If this isn't option, invite local farmers into the school to talk about their work. If you have any ethnic markets in your area, field trips to these stores can offer children an opportunity to discover diversity in local diets. Partnering with local organizations to host cooking classes at your school (you provide the space and the community partner provides the instruction) can be another great way to bring the community into the school.

Self-guided Opportunities

Loose Parts

Ubiquitous, classic playdough is an essential component to the loose parts collections for *How Are We Connected?* Consider making the playdough with children to extend the experience (see recipe, p.197). Wool, cornstalks, feed corn, and wheat stalks can all serve double duty as loose parts for children to incorporate into play, as well as empty food containers (boxes and plastic containers), spoons, bowls, and measuring cups. Natural materials such as stumps, rocks, sticks, and strips of leather

Playing with Food *Is it OK?*

In a world where not everyone has enough to eat, "playing" with food always presents a dilemma. Is it appropriate to use food for play, when so many children face hunger every day? This is something our educators have struggled with, and haven't resolved. We feel there is value having these food items available for children to explore, but we also acknowledge the privilege of having food in such abundance. This came alive for us one day when one of our educators was working with a group of children who had recently immigrated to the United States and previously lived in refugee camps. The children were sitting in kiddie pools full of feed corn intended for sensory play, and instead of playing, began eating. This was a powerful and moving experience for us, one that has called for a great deal of processing, grappling, and reflection. While we still provide kiddie pools of feed corn for children to explore, we struggle with the ethics of wasting food and implying that it is for play. We are more sensitive and aware of the messages it sends and some of our educators opt not to use food for this type of sensory play or traditional pre-school art projects, like bean mosaics or macaroni necklaces. In an attempt to address the issue, we have decided not to use food that is fit for human consumption in a way that will render it inedible. (In contrast, we let children grind feed corn, which is intended for livestock, then feed it to our chickens.) We continue to encourage children to engage with food through growing, harvesting, and then eating their bounty. We believe that struggling with this inequity is important and should not be brushed aside, but rather confronted and kept in the front of our minds.

can all be used. (Once you've introduced grinding corn, see p.189, the tools can be offered for children to continue to work with on their own.) The block collection can be used to create stores and buildings; cardboard boxes can be transformed into shipping containers or farm stands. And if your classroom has a collection of plastic farm animals and a barn this is the perfect time to leave them out for play.

Dramatic Play

To explore "how are we connected?" the dramatic play area can be transformed into a multitude of settings: farmers' market or farmstand, grocery store, clothing store. Consider providing dress-up clothing that will allow children to transform themselves into farmers, butchers, bakers, grocers, or chefs. Allowing children to explore real food through taste tests and providing snacks for the group can also be a way to infuse dramatic play with a touch of reality. Highlight seasonal produce to connect where you are to what you eat. The play kitchen can be stocked with plastic or wooden food replicas, recycled packaging from real food items, and playdough. Consider providing a collection of fabric scraps from a variety of fibers for children to play at designing clothing. Provide animal puppets and costumes to allow for another dimension of dramatic play.

Outdoor Play

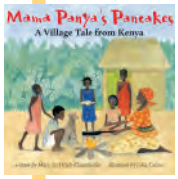
Invite children to play in the garden whatever the season—exploring, digging, planting, tasting, harvesting. Create a "play garden" where children can plant rocks, pinecones, sticks, and other treasures, or make mud pies. Make child-sized gardening tools available for unstructured play. Encourage the children to pretend to be farm animals by offering hobby horses, sheep, and cows. Whenever outside, encourage children to ask questions and follow their curiosity.

Linda's Picks

for HOW ARE WE CONNECTED?

Seed Magic by Jane Buchanan and Charlotte Riley-Webb. *Peachtree Publishers, Atlanta, GA, 2012.*

Flower Garden by Eve Bunting. *Sandpiper, 2000.*

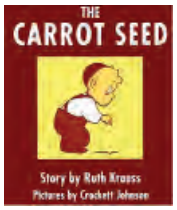


Mama Panya's Pancakes, A Village Tale from Kenya by Mary & Rich Chamberlin. *Barefoot Books, Cambridge, MA, 2005.*

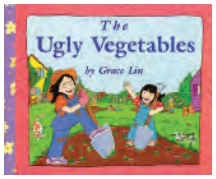
How Groundhog's Garden Grew by Lynne Cherry. *Scholastic Inc., NY, NY, 2003.*

Jack's Garden by Henry Cole. *Greenwillow Books, NY, NY, 1995.*

The Chicken Chasing Queen of Lamar County by Janice N. Harrington. *Douglas & McIntyre Ltd, Toronto, CA, 2007.*



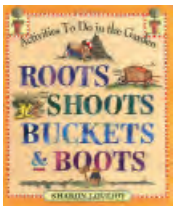
The Carrot Seed by Ruth Krauss. *Harper Collins, Mexico, 1945.*



The Ugly Vegetables by Grace Lin. *Charlesbridge, Watertown, MA, 2001.*

Tops and Bottoms by Janet Stevens. *Scholastic, Inc., NY, NY, 1996.*

Our School Garden by Rick Swann. *Readers to Eaters, Bellevue, WA, 2012.*



for educators

Roots, Shoots, Buckets and Boots by Sharon Lovejoy. *Workman Publishers, NY, NY, 1999.*

Art

Many elements of food and fiber can be offered to children to incorporate into their artwork—seeds, wool, yarn, feathers, food packaging, twine, sticks, and empty seed packets and seed catalogs. Clay or playdough are great three-dimensional media for children's creativity. Introduce children to weaving using a simple loom, and offer both manufactured yarns and natural fibers such as grasses and vines for weaving.

Numeracy

Baking is the perfect opportunity for children to practice measuring skills and become familiar with recipes. Sorting, weighing, and grading eggs can be done using egg scales if you have access to eggs, real or pretend. Children can survey their peers to find out who likes different kinds of foods, and then graph the results. The classroom collection of plastic and wooden food items (and even laminated photos of foods) can be used to carry out numerous food sorts: size, color, shape, classification, like/dislike. Explore the patterns in woven fabrics. Practice measurement by gluing seeds spaced out on toilet paper, then plant the paper right in the garden!

Explore Table

Set up an area in the classroom where children can further investigate food and fiber. Using a wheat mill, children can hone gross motor skills while processing grain into flour. Offer a new or unusual vegetable in a self-service taste test. Fill your water table with feed corn, soil, or seeds. A bucket of warm, soapy water and dirty fleece can offer children another chance to wash the wool following "Felting Fun" (see p.185). Offer magnifying glasses so children can get a closer look—offer wheat stalks, scraps of wool or fabric, seeds, or any item that draws children's interest.

How Are We Connected?

Facilitated Learning Experiences:

KEY: Community • Food & Farming • Nature

WHAT'S THE **Big Idea?**
Community
Interdependence
Cycles

EVERY SEASON

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Water, Water Everywhere

WHAT'S THE **Big Idea?**

Interdependence

Enduring Understandings

- All living things are connected.
- Water that falls on our place is connected to water all over the world.

Objectives

- Children discover that water is a resource that is everywhere.
- Children experiment with water.
- Children play with water.

Directions

This is a great activity do any time of the year after a heavy rainfall.

1. Read *A Drop of Water* by Gordon Morrison. Make a list of the places where children find water in their lives, indoors and outdoors.
2. Focus on the water that is outdoors in your place. Where is the water found? A community may be located near a river or brook, a lake or pond. Discuss these water sources, show pictures of them, locate them on a map. If possible, visit these water sources.
3. After a heavy rain, have your students follow the running water. Where is going? Down a sewer drain? Collecting in a puddle? Running into the lake? Discuss what will happen to it in these locations.
4. Do "The Water Cycle Dance," to remind children of the water cycle (see "Water Goes Up and Down" in *What's Happening*, p.151).
5. Allow children to put acorn lids, sticks, or any natural floating objects into the flowing water to follow the water's path. Where do these objects end up? Make dams to try to change the water's course. Discuss findings. Draw pictures or take photos of what happens.
6. Revisit the sites the next day, in several days. What has changed? Stayed the same? Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Where does water come from?
- Where does water go?
- How do people use water?
- How does water help your community?
- How does it hurt your community?

Materials

- ***A Drop of Water*** by Gordon Morrison
- map of your community showing sources of water
- pictures of water sources- lakes, ponds, rivers, brooks (specific to your area, or generic images)

Extensions

- ***Water Dance*** by Thomas Locker
- Encourage children to add landforms made out of every day "good junk" to your water table to represent hills, meadows, roads. Children can manipulate the landforms and observe what the water's reaction. Add more water, what results? Take water away, what happens?

Got Cheese?

WHAT'S THE **Big Idea?**

Interdependence

Cycles

Materials

- ***Extra Cheese, Please*** by Cris Peterson
- ingredients for cheese making (see Recipe Card)
- sauce pan
- wooden spoon
- colander
- cheesecloth or a fine mesh strainer
- two bowls

Enduring Understandings

- Milk changes from a liquid into a solid, cheese, when a certain process is followed.
- Cheese is made from milk.
- Milk comes from cows.
- Cheese can have many different tastes and forms.

Objectives

- Children demonstrate how to follow a recipe to make cheese.
- Children show interest and curiosity about how cheese is made.
- Children play being a cheese maker.
- Children understand that food comes from nature.

Children begin making cheese by stirring the milk mixture over heat until the milk starts to curdle.

Directions

1. Ask the children if they know what cheese is made from. Do they like cheese? What are their favorite kinds? See how far back they can trace the food chain: cheese -> milk -> cow -> water + grass + sunlight.
2. Read *Extra Cheese, Please* by Cris Peterson. Discuss the cheesemaking process with children. Ask if the children would like to make cheese. Make sure to wash hands and discuss good hygiene when cooking with children.
3. Show the children the ingredients and ask if they have any ideas about how to make cheese. Consider writing the recipe out for children to follow along. Explain the cheese-making process, then begin. Allow the children to help whenever possible. Ask children to use their "owl eyes" to observe the process. First, put the milk into the saucepan, then add the vinegar or lemon juice. Heat the milk mixture for 8–10 minutes on low heat, stirring occasionally until it starts to curdle.
4. Remove the pan from the heat, but continue stirring until all the milk has curdled. It has now separated into curds, which is the solid part, and whey, which is the liquid. Allow the children to taste it if they like and see what Little Miss Muffet was eating!
5. Have the children line the colander with two layers of cheesecloth and set it over a large bowl. Pour in the curds and whey.
6. Carefully gather the four corners of the cheesecloth together and twist it to form a bag around the curds. Continue twisting to squeeze out as much whey as possible.

Little Miss Muffet's Cheese Curds

INGREDIENTS

2 cups milk
3 tbsp. of lemon juice or vinegar
a pinch of salt

INSTRUCTIONS

1. Put the milk into the saucepan, then add the vinegar or lemon juice. Heat the milk for 8–10 minutes on low heat, stirring occasionally until it starts to curdle.
2. Remove the pan from the heat, and continue stirring until all the milk has curdled. It has now separated into curds, which is the solid part, and whey, which is the liquid.
3. Line the colander with two layers of cheesecloth and set it over a large bowl. Pour the curds and whey into the colander.
4. Carefully gather the four corners of the cheesecloth together and twist them to form a bag around the curds. Continue twisting to squeeze out as much whey as possible.
5. Next place the curds into another bowl, add some salt to taste, and have the children stir. You can also add fruit or herbs.

7. Next, place the curds into another bowl, add some salt to taste, and have the children stir it up. You can also add fruit or herbs. Ask the children to predict how it will taste. Consider dividing up the cheese curds and making several different flavors, then doing a taste test to compare.
8. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What did we start with? *(milk)*
- Where did the milk come from? *(a cow)*
- What did we add to it? *(lemon juice and heat)*
- How did it change? Describe what happened to the milk. *(The milk solids, called the curds, separate from the whey.)*
- Does this cheese taste like other cheese you have eaten?
- What are some of your favorite foods that include cheese?

Extension

- "Cheese tasting:" Taste a variety of cheesed and compare them to the cheese you made. Graph favorites or write descriptions of textures and tastes.

Pizza: From Farm to You
(Forget the box!)

Materials
- ***Pizza at Sally's*** by Monica Wellington
- ingredients and equipment to make pizza (see recipe cards on facing page)
- pizza toppings, if desired

WHAT'S THE **Big Idea?**
Interdependence

Enduring Understandings
- All living things are connected.
- Food comes from nature: from plants and animals.
- Humans cultivate plants to provide us with food.
- Human raise animals to provide us with food.

Objectives
- Children demonstrate an understanding that a pizza comes from a farm, not a box.
- Children discover how to make a pizza and all of its corresponding parts from scratch.

Directions
At Shelburne Farms we have a fall field trip called *Farm to You*, where students from kindergarten to fifth grade make pizzas from scratch! In four hours, four groups make different parts of the pizza: dough for crust, tomato sauce, cheese, and toppings. You may want to spread the process out over several days so everyone can have a role in making each part of the pizza, or you can round up lots of parent volunteers and make the pizzas in one day and celebrate with a pizza party.

1. Discuss pizza! Ask, "Who likes it?" "What toppings do you prefer?" "Who wants to make one?"
2. Ask children to name the parts of a pizza: crust, sauce, cheese, and toppings. Ask, "Where do these parts originate?"
3. Read *Pizza at Sally's* by Monica Wellington to discover what process they followed.
4. Talk about what it would take if the class made its own cheese or ground its own flour. Once you have decided if you will make the pizza in a day, or over several days, you'll know how to divide up the workload. Prepare each pizza part, as described below.
5. **Dough:** Grind wheat berries into flour using a wheat mill or purchase flour from the store. Follow the recipe provided to make pizza dough. You can pre-cook the dough and then freeze it for later use, or make it as the last step before putting the pizza parts together.

Pizza Dough

Recipe makes two dinner-plate-sized pizza crusts.

INGREDIENTS

5–6 c. flour
2 tbsp. sugar
2 tsp. salt
1 ½ tbsp. yeast
¼ c. oil
2 c. warm water

INSTRUCTIONS

1. Mix yeast, warm water, and sugar in a bowl. Let sit for about five minutes to allow yeast to activate.
2. Add one cup of flour to the yeast water and mix. Stir in salt and olive oil. Mix in remaining flour until dough is consistent.
3. Knead dough on floured surface for about ten minutes. Form dough into a ball, then place it in a lightly oiled bowl to rise.
4. Once the dough has doubled in size, knock it down by punching it with a fist.
5. Cover with either a wet cloth or plastic wrap until ready to roll out. (If using plastic wrap, be sure to oil the surface of the dough to prevent sticking).

Pizza Sauce

INGREDIENTS

20 tomatoes
2 tbsp. olive oil
1 large onion, chopped
3 cloves garlic, minced
fresh herbs (sage, basil, oregano, thyme), chopped
salt, pepper, and honey to taste

INSTRUCTIONS

1. Bring a pot of water to a boil. With a knife, make a small "x" on the bottom of each tomato. Place tomatoes in boiling water for a few seconds, until you see that the skin is starting to come loose. Remove from water. When cool enough to handle, rub off skins and compost.
2. Core peeled tomatoes. Squish the flesh so that there aren't too many large pieces in your sauce. ("hands optional" for the squishing part).
3. Heat olive oil in a large saucepan over medium heat. Add onions, garlic, and a dash of salt. Sauté five minutes, or until onions turn translucent.
4. Add tomatoes to the onions and garlic. Bring to a boil.
5. Add herbs, salt, pepper, and honey. Reduce heat to a rolling simmer (about medium-high heat).
6. Stir occasionally and cook until sauce is thick (no water sitting on top of tomato solids). It's ready to put on your pizza!!

Queso Blanco Cheese

Spanish for "White Cheese"

INGREDIENTS

1 gal. whole milk
¼ c. white vinegar*
1 teaspoon salt

**Substitute the juice of 3–5 lemons for the vinegar, or add in addition to. The cheese will have more tang!*

INSTRUCTIONS

1. Heat milk to 185°F, stirring constantly. (Be careful not to burn it!)
2. Add white vinegar in 3 equal additions, and continue to stir. While stirring, watch for white curds and light green whey to form.
3. Let rest for 5 minutes.
4. Line a colander with cheesecloth, and while stirring slowly, pour the milky mixture into the cheesecloth.
5. Add salt and stir gently to mix.
6. Tie the corners of the cheesecloth together and hang it to drain (5–7 hours is ideal, but 10–30 minutes is sufficient).
7. Solidified cheese can be broken and salted or kept unsalted. (You can also add herbs for flavor!)

6. **Sauce:** There are several options. You can visit a farm to harvest tomatoes, pick them from your school garden, go to a farmers' market to buy directly from the farmer, or purchase the tomatoes at a local grocery store. If you do this activity in the summer, many families who have gardens may have an excess of ripe tomatoes and would welcome the chance to donate them for a delicious sauce. Follow the recipe provided.
7. **Cheese:** Most likely, you'll be hard pressed to find a cow to milk, so head to the grocery store for milk and other ingredients for the cheese. Follow the recipe provided.
8. **Toppings:** After much deliberation, decide on toppings for the pizza and discuss where to find these toppings. Gather, wash and chop the toppings.
9. Once all the parts are made, you're ready for the **final pizza assembly:**
    a. Preheat your oven to 425°F.
    b. Divide the dough into two balls and roll them out. Try your hand at twirling the dough into a air to make a round shape. You can also roll into a rectangular shape to fit onto a cookie sheet if you do not have round pizza pans. Keep the crust thick enough to avoid holes, but not so thick that it won't bake all the way through.
    c. Place a layer of cornmeal on the pans to prevent sticking. Lay the dough on the pans. Add sauce, cheese, and toppings.
    d. Bake your crust for about ten minutes. Time will vary depending on the thickness of your crust. While your pizza is cooking, process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.
    e. Let the pizza cool, then cut into slices let the pizza party begin!

Extensions

- ***Let's Make a Pizza*** *(Welcome Books: In the Kitchen)* by Mary Hill
- ***The Little Red Hen (Makes a Pizza)*** by Philemon Sturges
- ***Pizza Counting*** by Christina Dobson
- Try different sauces and toppings and make pizza throughout the year.
- Challenge another class to a pizza bake off.
- Plant a Pizza Garden (see "Digging In," p.204)

Discussion Questions

- Where does cheese come from?
- What other food comes from cows?
- Where does pizza dough come from?
- What other foods come from wheat?
- Where does pizza sauce come from?
- What else comes from tomatoes?

From a Cow?

WHAT'S THE **Big Idea?**
Interdependence

Enduring Understandings

- Food comes from nature: from plants and animals.
- People depend on cows and cows depend on people.
- All living things are connected.

Objectives

- Children demonstrate an understanding of the food cycle.
- Children consider how humans use cows to meet our needs.
- Children play with animal products, identifying cow products.

Directions

1. Read *No Milk!* by Jennifer Ericsson. Discuss with children the different kinds of products that we get from a cow.
2. Tell the children you have a bag filled with four products that come from a cow. Invite a few children to reach into the bag and pull an item out. Ask the children to identify the item and how it comes from a cow.
3. Lay the cow products out. Hold each product up one at a time and ask, "What are some items that we can make from each of these?"
   - **Milk:** cheese, butter, yogurt, ice cream, etc.
   - **Meat:** sirloin steak, ribs, hamburger, etc.
   - **Leather:** shoes, belts, purses, coats, etc.
   - **Manure:** fertilizer, potting soil
4. Divide the children into two groups. Explain that they will compete in a relay race as they identify animal food products that come from a cow.
5. Take out the bin of food items. Have each team form a line. Ask the first child in each line to pick an item out of the bin. He or she should determine if it comes from a cow, seeking help from teammates if necessary. Children who can read can be encouraged to look at the ingredient labels.
6. Explain that once the child decides if it is from a cow, or not, the child should run and place the item in either the bin labeled "From A Cow," or labeled "Not From A Cow." The child drops the product into the appropriate bin, runs back to the line, taps the next child to go.

Materials

- ***No Milk!*** by Jennifer A. Ericsson

A bag of cow products (pictures of each item would work as well):

- **milk:** milk carton
- **meat:** rubber steak dog toy
- **leather:** piece of leather
- **manure:** a bag of dark soil

- basket or bin of general food items, some that include cow products, others that don't
- bin labeled: "From a Cow" (or with a picture of a cow)
- bin labeled: "Not from a Cow" (or with a picture of a cow with an "X" through it)

A bag of cow products representing: milk, meat, leather, and manure

Extensions

- Make ice cream (p.213), butter (*What's Happening?* p.133), or cheese (p.178) as a way to make the connection that milk provides many food products for humans.
- Invite a dairy farmer to your class to explain what is involved with his or her profession.
- Make a class recipe book of favorite cow products.

7. Once everyone in a line has had an opportunity, the line sits down and waits for the other line to finish.
8. Once everyone has finished, the entire group should go through the bins to explain their choices.
9. Finally, process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

How do humans depend on cows?
How do cows depend on humans?
What do humans do if they cannot tolerate cow's milk?
Can you think of any other ways people use cows or products from cows?

Felting Fun

WHAT'S THE **Big Idea?**

Interdependence

Enduring Understandings

- All living things are connected.
- Food and fiber comes from nature: from plants and animals
- Human raise animals to provide us with food and fiber.
- Animal fiber can be used in many ways.

Objectives

- Children demonstrate the process of felting.
- Children show interest and curiosity in how wool fleece can be used.
- Children experiment with making different types of felted products.
- Children play with fleece.

At the farm, we have felted with children as young as four years old. For this age, it's important to do a dry run to set the stage for what they'll experience. They are going to turn a clump of fleece into a ball but it will take some magic! Have them relax and breathe deeply before starting, and get their hands ready for some magic work. Tell them that felting takes a soft touch. With an imaginary ball, have them practice gently, not tightly, rolling the ball around in their two hands. Warn them that when the ball is plunged into the warm, soapy water, it will fall apart unless their magic hands stay in the ball shape and gently work their magic on the fleece. With the stage set, you're ready to begin!

Directions

1. Set up several stations that each includes a towel and two water tubs or buckets: one with hot soapy water and one with cold water. The number of stations will depend on the number of children. Three to four children can fit comfortably around a tub.
2. Take a golf-ball-sized amount of clean, dry, carded wool and roll it between your two hands to shape it into a ball.
3. Take strips of clean, carded wool and wrap them one at a time around the loose ball. Keep the wool fibers flat and spread out (not twisted like strands of yarn), as you cover the entire ball. Add strips of wool until the ball is as big as you want. Keep in mind that when you place the ball in the warm water and felt it, it will shrink to about one third of the original size.
4. Now place the ball into the warm, soapy water, holding it in both hands. Take it out and hold the ball over the bin of water as you start

Materials

- ***Felting for Kids: Fun Toys, Cool Accessories*** by Gry Hojgaard Jacobson and Sif Hojgaard Hoverby
- ***Kids' Crafternoon Felting: 25 Projects for a Crafty Afternoon*** by Kathreen Ricketson
- sheep fleece (You can order clean felting batting at www.zwool.com)
- ivory soap
- wash tubs or buckets
- towels

Extensions

- Color the fleece using the natural dyes. See "Natural Dyes" in *Who Are We?,* p.62.
- Color the fleece by placing the undyed fleece in a plastic tub filled with warm water and two packages of Kool-Aid (your choice of color!) plus one tablespoon of vinegar. Leave the fleeces in the solution for several hours or until the water is clear of color. Gently squeeze out the water, hang to dry. When felting use the color fleece as the top strands of your ball. Combine colors to make a rainbow ball.

felting: gently squeeze, pat, roll, and smooth the ball. The fibers will begin to stick together. Rub and roll the ball in your hands until no fibers come undone when you rub the whole surface. Now it is completely felted.

5. Dip the newly felted ball into the cold water tub. Take out and continue rolling the ball between your two hands. Repeat several times. If the ball still feels loose, go back to the warm water tub and repeat the process several more times. If time runs out, encourage children to continue the felting process at home in the tub when they are bathing.
6. When the ball is hard, squeeze out any extra water with a towel. Let it dry and then play with it! Your cat will love it, too.
7. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- How did the wool fibers stick together?
- Can you think of some things that are made with felt?

Apples to Sauce

WHAT'S THE **Big Idea?**
Cycles

Enduring Understandings

- Food comes from nature: from plants.
- Apples are a food that can be enjoyed in many ways.

Objectives

- Children show interest and curiosity in making new foods.
- Children discover that heating a food can change its texture.
- Children experiment with different apples and how they taste.

Directions

If possible, take a learning journey to an apple orchard to harvest some fresh apples for your sauce. If not, buy apples at the local supermarket.

1. Read *Apple Picking Time* by Michele Benoit Slawson. Discuss how these children helped their families pick apples. Ask children to describe ways the different ways they eat apples: plain, dried, carameled, in a pie, or perhaps turned into applesauce.
2. Ask children what would be needed to turn apples into a sauce. How will sauce be different than the apple? How can we make this happen?
3. Have children cut apples into quarter-size pieces, using kid-safe cutting tools (you can purchase these at www.forsmallhands.com).
4. Place apples into the slow cooker with a cinnamon stick or two. Heat the apples for an hour at a high setting. Test for softness with a fork. If the fork can easily pierce the apples, place them into a food mill and have students mill the soft apples into sauce. If you are using a potato masher, peel the apples prior to cooking, and expect a slightly lumpier final product. While the apples are simmering, sing one of the apple songs included here!
5. Enjoy the applesauce warm or cold. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Materials

- ***Apple Picking Time*** by Michele Benoit Slawson
- apples
- child-sized cutting tools
- cutting boards
- slow cooker or cooking pot with access to a stove
- cinnamon sticks
- food mill, or potato masher

Extensions

- ***Apple Pie Tree*** by Zoe Hall
- ***One Green Apple*** by Eve Bunting
- Make applesauce again using a different type of apple. Discuss how it tasted compared to the first batch. Which batch did the students like? Graph the results.
- What other recipes can you make from apples? Create an apple recipe book.

Discussion Questions

- Where do apples come from?
- Would the apple sauce taste the same if we used a different type of apple?
- Why did the apples change their shape?
- What else beside cinnamon could we have added to the apples?

"Apples, Apples" Song

Sung to the tune of "Twinkle, Twinkle, Little Star"

Apples juicy, apples round,
On the tree or on the ground.
Apples yellow, apples red,
Applesauce and juice and bread!
Apples crunchy, apples sweet,
Apples are so good to eat.

"Apple" Song

Sung to the tune of "BINGO"

I know a fruit that grows on trees,
And apple is its name, oh!
A P P L E
A P P L E
A P P L E
and apple is its name, oh!

In summer and in early fall,
It's time to pick an apple! (repeat A-P-P-L-E)

It may be sweet or may be tart,
It's red or green or yellow! (repeat A-P-P-L-E)

A MacIntosh or Granny Smith,
A Winesap or Delicious! (repeat A-P-P-L-E)

Make applesauce or apple juice
Or apple pie with apples! (repeat A-P-P-L-E)

from VT-FEED Food, Farm & Nutrition Curriculum Units

Corn

WHAT'S THE **Big Idea?**

Cycles
Interdependence

Enduring Understandings

- We rely on each other and other living things to meet our needs.
- Food comes from nature: from plants and animals.
- Sometimes people process foods so that they can eat the foods in different ways.

Objectives

- Children cultivate an understanding that food comes from nature.
- Children engage in processing food by demonstrating the use of simple machines to grind wheat.
- Children show interest and curiosity in processing raw food into finished food products.

Directions

1. Have corn stalks and ears of corn available for the children to examine. Fill the water table with loose field corn kernels for exploration. Place some field corn-on-the-cob in the table for children to remove the corn from the cob.
2. Ask the children if they like corn. If yes, how do they like to eat their corn?
3. Show the children the pictures (or the actual food) of corn-based foods available: corn bread, corn on the cob, can of corn, corn fritters, cream corn, popcorn, etc. Ask, "How does the corn from the stalk become these products?"
4. Explain that people often process food from its natural state into a different food product. Tell them that today they will get to turn corn kernels into corn meal. Demonstrate how to process the corn: Put a handful of corn kernels on the stump, cover with a piece of scrap leather, and carefully crush the corn with the rock. Let the children try it.
5. Demonstrate the correct use of the food mill, place a small handful of corn into the mill and turn the handle. Let the children try it. Collect cornmeal and save for a cooking project or to feed chickens.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Materials

- log stumps *(one per station)*
- child-hand sized rocks *(one per station)*
- leather scraps *(a few per station, approximately 3" x 4")*
- food mill *(See Lehman's at www.lehmans.com)*
- corn stalks & dried corn on the cob *(often available from holiday décor stores, nurseries, or hardware stores)*
- dried corn kernels *(available at natural food stores, you could use popcorn kernel, too)*
- field corn/feed corn *(available at hardware or feed stores)*
- pictures (or the actual items) of corn-based foods: corn bread, corn on the cob, can of corn, corn fritters, cream corn, popcorn, etc.
- water table

Extensions

- ***The Popcorn Book*** by Tomie dePaola
- ***Corn*** by Gail Gibbons
- ***I Like Corn*** by Robin Pickering
- Visit an actual corn field to examine the plants growing. If possible, play hide-and-seek among the stalks!
- Save some of the corn kernels to plant.
- Feed your schoolyard chickens the crushed corn. No chickens? Save and take on a farm visit and ask the farmer if you may feed the chickens some corn.

To make corn meal from raw corn kernels, place a handful of corn in the center of a stump, cover with a scrap piece of leather (so corn bits don't go flying!), and pound with a rock. Lift the leather every so often to check your progress and to brush larger corn bits back into the pile for more crushing.

Discussion Questions

- Where does corn come from?
- What do we do with corn?
- How do you get your corn?
- What are some the things that need to happen to have your favorite type of corn on your plate?
- What did we use to crush the corn? Where are these materials found?
- What could we use the corn we processed for?
- How else do you think people crush corn to make cornmeal?

Johnny Cakes

WHAT'S THE **Big Idea?**
Cycles

Enduring Understandings

- Food comes from nature: from plants and animals.
- We can eat these plants in a variety of ways.
- Corn is a plant that can be eaten in many different ways.

Objective

- Children show interest and curiosity in making their own corn cake.
- Children discover that corn can be eaten in many different ways.
- Children experiment with crushing corn kernels into corn meal with a rock.

Directions

For over twenty years, thousands of children of all ages have been making Johnny Cakes at our annual Harvest Festival. They make corn meal by grinding a small amount of corn kernels with a rock on an old stump *(see photo on facing page)*. They then add a "corn cake mix" to their corn meal, add water and honey, stir, and present it to our staff to be baked on a hot griddle stone over an open firepit. We have been perfecting the process and recipe over these many years and we share it with you here. Prior to this experience, if possible, explore a corn field and harvest any corn that remains so children can make the connection that corn meal comes from corn that grows on corn plants.

1. Discuss ways the children like to eat corn: corn on the cob, corn kernels, popcorn, creamed corn, or maybe even cornbread. Explain that some folks call cornbread "Johnny Cake."
2. Ask the children how the corn kernels on the cob get transformed into cornbread. Show some cornmeal and explain that dried corn kernels are transformed into this meal that is used like flour in baking.
3. Ask the children if they would like to make cornmeal. Using either old tree stumps or a food mill, demonstrate how to grind corn kernels into a corn meal. Encourage children to crush those big chunks into smaller pieces. When the students have exhausted in crushing their corn, compare the cornmeal to the corn crushed by the students. In past times, coarsely crushed corn was eaten by people. Ask which might feel better on our teeth, and explain that the corn they've crushed can be saved and given to animals for feed.
4. Invite the children to make some Johnny Cakes. Add 2–3 tablespoons of corn cake mix (see recipe on next page), honey to taste, and enough water to make a thick batter. If you add too much water, add

Materials

- food mill
- stumps
- kid hand size rocks
- leather pieces 3 in. x 4 in.
- corn kernels (see tip)
- ingredients and equipment to make Johnny Cakes (see recipe card, next page)

Tip!

Buy corn kernels at the bulk section of grocery store or experiment with making your own dried corn kernels. Corn can be dried on the cob by placing the husked ears on a screen that is set on sawhorses so air can circulate all around the ears. Turn the corn daily for seven days. Test the kernels with your fingernail to make sure they are hard. If not, allow the cobs to dry a little more. Remove the kernels from the cob when dry. Store in an airtight container until ready to use.

more mix to thicken it up. Cook the Johnny Cakes with adult supervision on a griddle until brown on both sides.
5. Serve with a little honey, and as you enjoy your Johnny Cakes, reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What did the corn cake taste like?
- How did the corn get from the plant to your belly?
- What would your life be like if you had to prepare all your food from "scratch"?

Johnny Cakes

Basic recipe for one cake

INGREDIENTS

2–3 spoons of Corn Cake Mix*
honey to taste
water (enough to create a thick batter)

***Corn Cake Mix:**
3 c. cornmeal (1 lb. cornmeal)
4 tsp. baking powder
1 tsp. salt

INSTRUCTIONS

Cook Johnny Cake on a hot, greased griddle. Enjoy!

Extensions

- Try making corn tortillas with your children. Buy Masa (also called Masa Harina), at the grocery store in the ethnic food aisle. Mix 1 cup Masa with a pinch of salt and ¾ cup of water. Mix, form into balls the size of golf balls, place in a tortilla press, flatten into a toritlla shape and cook on a griddle for 30–60 seconds on both sides. Enjoy.
- ***Johnny Cake*** by William Stobbs

Sum of the Seeds

WHAT'S THE **Big Idea?**

Cycles
Interdependence

Enduring Understandings

- All living things are connected.
- Food comes from nature: from plants and animals
- Most plants originate from seeds.
- Fruits are the part of the plant that holds the seeds.

Objectives

- Children demonstrate an understanding of the role of seeds in the plant's life cycle.
- Children show interest and curiosity in how plants grow.
- Children discover not all fruits have the same number of seeds.
- Children experiment with estimating the number of seeds in a fruit.

Directions

1. Read *Pick, Pull, Snap! Where Once A Flower Bloomed* by Lola M. Schaefer.
2. Ask for some ideas of what fruits we eat. What is a fruit? *(the part of the plant that contains the seeds)* How many seeds are inside of a fruit? *(depends on the fruit)*
3. Hand out the tomatoes, plates, and knives to each child or team.
4. Estimate how many seeds are inside their tomato. Record these guesses on a chart with team names, leaving space to add the actual amount of seeds they find in their tomato.


counting the seeds inside a cherry tomato

5. Explain how to safely use the knife and then have students cut open their tomato and begin counting the seeds they find inside. The seeds can be put in groups of 2's, 5's or 10's if this is something you are working on in math.
6. Have everyone report their actual numbers and record them on the chart. Compare the estimates to the actual number seeds they found.
7. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Were there the same number of seeds in each tomato?
- Why are there so many seeds in each tomato?
- Would they all grow into a new tomato plant?
- What about other fruits and how many seeds they might have?

Materials

- ***Pick, Pull, Snap! Where Once A Flower Bloomed*** by Lola M. Schaefer
- cherry tomatoes: one for each child or for a team of two
- plates
- butter knives

Extensions

- Try four or five different kinds of fruits and record the number of seeds found in each. Compare and see who has the most, least, same.
- Discuss the difference between a fruit and a vegetable, cut out pictures of fruits and vegetables and sort them into what part of the plant they are: fruit, root, stem, leaf, flower.
- What do seeds need to grow? See "The Fabulous 5," in *Who Are We?* p.75.

Wonderful Wheat

WHAT'S THE **Big Idea?**
Cycles

Enduring Understandings

- We rely on each other and other living things to meet our needs.
- Food comes from nature: from plants and animals.
- People eat different parts of plants.
- Wheat is a plant that has many parts, flour is made from wheat berries.

wheat berries

Materials

- hand operated grain mill *Available at Lehman's, call 877-438-5346, or: www.lehmans.com*
- wheat berries *(available at many grocery stores or natural food stores in the bulk section)*
- wheat stalks *(Obtain some from a local farmer or plant your own to harvest. Sometimes wheat stalks may be found at craft or home décor stores)*
- flour sifters *(typically used in baking)*
- sheet or drop cloth

Did you know?

Early wheat farmers would chew a handful of wheat berries as the first chewing gum!

Objectives

- Children cultivate an understanding of where their food originates.
- Children show interest and curiosity in processing raw food into finished food products.
- Children engage in processing food by demonstrating the use of simple machines to grind wheat.

Directions

1. Lay a sheet or drop cloth on the floor and place the wheat stalks on it. Examine the plants with the children. Challenge them to point out the stalk or stem, leaves, and the wheat head. Have them notice that the stem is hollow. This is called straw. Farmers will save the straw for bedding in their animals' stalls. Is this where the first drinking straw idea came from?
2. Invite the children to break the wheat head off and hold it in their hands. Have them roll the head between their hands to loosen the wheat berries from the chaff. Let all pieces fall to the sheet and have children pick up the loose wheat berries. All the other plant material that is left over is called the chaff.
3. Ask the children try to crush a berry between their fingers. Can they do it? It's a hard berry, not like a blueberry or strawberry. Invite the children to eat a few of the berries, crushing them between their molars. Ask, "What do they taste like?"
4. After exploring the wheat berries, demonstrate how to grind them in a grain mill using some of the wheat berries the children have harvested. Together with the children, look at the new product you have created: flour! Ask the children what flour is used for.
5. Using the bulk wheat berries to supplement your supply, let the children grind them into flour. Save the flour for use at a later time—for baking or to use to make play dough. You can let the children help decide what to make with their flour at a later time.

6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What is wheat?
- Where does wheat come from?
- How can we use wheat for food?
- What types of foods are made from wheat?
- How can we harvest the wheat berries to grind into flour?
- How can we use the flour we make?

Gluten-free options

You can grind rice or other grains in the mill to make gluten free flour.

Extensions

- ***Bread Comes to Life: A Garden of Wheat and a Loaf to Eat*** by George Levenson
- ***Sun Bread*** by Elisa Kleven
- ***Bread Is For Eating*** by David Gershator, Phillis Gershator, and Emma Shaw-Smith
- ***BREAD BREAD BREAD*** by Anna Morris
- ***Good Bread: A Book of Thanks*** by Brigitte Weninger
- Grow your own wheat! According to the Organic Consumer Association, a 10'x10' plot of fertile land can harvest enough wheat berries for 10–25 loaves of bread. OCA recommends planting red wheat in late September or early October as this wheat is more nutritious than spring wheat, protects the soil in the winter, and has less competition from weeds. (You can buy wheat berries at a health food store). The wheat may start to grow, be buried in by snow, and come up again in the spring. Harvest in late June when the wheat begins to turn golden but still has a few streaks of green. Tie into bundles and stand them upright, allowing the grain to fully ripen into a golden color. *(from OCA, May 28, 2009)*
- see "Wheat Life Cycle Cards" and "Wheat to Bread Cards" in Appendix, pp.251 & 253.

Bread, Good Bread

WHAT'S THE **Big Idea?**
Interdependence

Materials

- ***Good Bread: A Book of Thanks*** by Brigitte Weninger
- ingredients and equipment to make "Little Breads" *(see recipe card)*

Enduring Understandings

- We rely on each other and other living things to meet our needs.
- Food comes from nature: from plants and animals.
- Knowing where our food and fibers come from is important to understanding the relationship between humans and the natural world.

Objectives

- Children demonstrate awareness that food comes from plants.
- Children connect prior experiences preparing food.
- Children practice measuring.
- Children experiment with baking bread.

Directions

Consider completing "Wonderful Wheat," p.196, prior to this experience, allowing children to make the connection that the wheat berries they ground into flour is the same flour they use to make the dough.

1. Read *Good Bread: A Book of Thanks* by Brigitte Weninger with your students. Ask if anyone has ever made bread before. If yes, how did they do it?
2. Explain to the children that you will be making bread together today. Use the bread recipe below to make bread with your class. Remember to instruct children in good hygiene practices before beginning any cooking project.
3. Prepare the bread dough together. Let children take turns

Little Breads

preheat oven to 375° F

INGREDIENTS

1 ¾ c. warm water (wrist temperature)
1 tbsp. active dry yeast
2–3 tbsp. of sugar (or same amount of honey or maple syrup)
1 tsp. salt
¼ c. vegetable oil
4–5 c. flour (mix of wheat and white)

INSTRUCTIONS

1. Mix yeast, sweetener, and warm water in a large mixing bowl and let sit for about 5 minutes to allow yeast to activate.
2. Stir in a handful of flour. Stir in salt and oil.
3. Add remaining flour one cup at a time to ensure you don't make the dough too dry. Knead dough until it forms a ball.
4. Place the dough in a bowl, cover with a damp cloth, and let rise in a warm place.
5. Divide dough into dinner-roll-sized pieces, have children knead the dough into any shape, and place on a cookie sheet.
6. Bake at 375° for 10–15 minutes or until golden brown.

What is Yeast?

Yeast is a single-celled fungus. The type used in baking is called a sugar-eating fungus. Yeast cells digest sugars to grow, which is why we add sweetener to "start" the yeast. As the yeast consumes the sugar, it produces carbon dioxide and ethyl alcohol. The carbon dioxide causes the dough to rise and the ethyl alcohol adds flavor to the bread.

Source: Red Star Yeast Company: www.redstaryeast.com

measuring ingredients, and use this opportunity to discuss recipes, measuring, and the baking process. Knead the dough together. Allow each child to shape their own Little Bread. Children can fashion the dough into any shape, but be aware that skinny dough legs and arms tend to cook quicker than fatter dough bodies.

4. While the bread bakes, consider using the discussion questions to process the experience with the children or make butter to put on the warm bread.
5. Enjoy the bread together!

Discussion Questions

- Who remembers what ingredients are in our bread?
- Where do these ingredients come from?
- What other foods have you eaten recently? Do these foods come from plants or animals?
- What other foods can you think of that come from plants? From animals?
- What other kinds of foods do you like to prepare?

Extensions

- Make butter (see "Shake It, Shake It, Shake It" in *What's Happening*, p.133) and enjoy it with the bread.
- Experiment with yeast. For example, observe if yeast reacts differently to white sugar, maple syrup and honey.
- Have children place "Wheat to Bread Cards" in the correct order (Appendix, p.251)
- ***Bread is for Eating*** by David Gershator
- ***Bread Comes to Life: A Garden of Wheat and a Loaf to Eat*** by George Levenson
- **Make playdough**! *(See recipe at left.)*

Playdough

INGREDIENTS

2 c. flour
1 c. salt
1 tsp. cream of tartar
2 tbsp. oil
2 c. water
food coloring (artificial, or natural, see "Natural Dyes," p.62)

INSTRUCTIONS

1. Add food coloring to water until desired color (don't be shy with it).
2. Mix dry ingredients in a bowl.
3. Mix colored water and dry ingredients in a saucepan on medium heat and stir together.
4. Stir until dough sticks together in a ball then remove from heat.
5. Let cool for a few minutes then knead a few times.
6. Keep in a sealed container to prevent drying out.

Dress up a Chicken

WHAT'S THE **Big Idea?**

Cycles
Interdependence

Materials

- ***Chicks and Chickens*** by Gail Gibbons
- pictures of chickens

Gather the following into a large bag:

- **feathers**: use feathers!
- **beak**: paper cone with string
- **comb**: hair comb glued on headband
- **wattles**: deflated balloons on a string
- **wings**: cardboard wings with string/ rubber band/tape for handle
- **feet**: 2 hand rakes (a claw-like hand tool for gardening). The handle is the chicken's fourth toe.

Enduring Understandings

- Food comes from nature: from plants and animals.
- All animals have certain characteristics such as how they look, what they eat and how they behave.
- Observing and learning about animal characteristics can help us better understand them, and how we all depend on one another.
- Chickens have unique body parts.

Objectives

- Children demonstrate an understanding of the food cycle.
- Children show interest and curiosity in the parts of a chicken.
- Children role play being chickens.

Directions

1. Read *Chicks and Chickens* by Gail Gibbons. Explain to the students that they are going to dress up one of their classmates as a chicken. Ask them to try to imagine what a chicken looks like and what special parts it has. Look at pictures of chickens. What makes a chicken unique?
2. Pick a volunteer from the class to be dressed up. Have him or her stand so everyone can see.
3. Ask students to suggest how to make the volunteer look more like a chicken. As they come up with ideas, pull the appropriate prop from your bag, and dress up the volunteer with the prop.
4. After you have dressed up the volunteer with all the chicken props you have, ask the students what they could add to make the student look even more like a chicken (longer

Parts of a Chicken

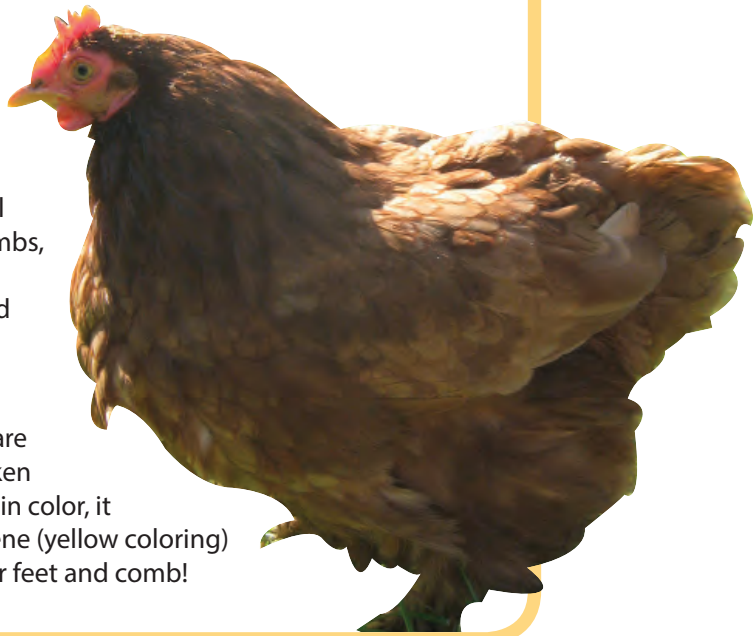
Feathers and Wings: Chickens have feathers for protection from weather conditions such as rain, cold, and sun. Feathers also protect the body from injuries. The color of feathers depends on the breed. There are three types of feathers: *flight* feathers, *down* feathers, and *contour* feathers.

Beak: Chickens have beaks to help them eat. A baby chick has an egg tooth on its beak to help it peck out of the egg. This "tooth" falls off when it is no longer needed, as soon as the chick cracks open its egg.

Wattles: Wattles help cool the chicken down. This happens when the blood circulates from the comb to the wattles.

Comb: The comb is a fleshy growth on the top of the chicken head. It helps the chicken to cool down. Both male and female chickens have combs, but the ones on the males are larger. Combs of different breeds may look different in shape and even in color. While most combs are red, some breeds have purple combs.

Feet: A chicken's feet has 16 bones. If her feet are bright yellow and her comb bright red, the chicken may not be laying. If these parts are more faded in color, it may indicate the hen *is* laying: she's using carotene (yellow coloring) in her body to color the egg yolks instead of her feet and comb!



tail for a rooster, different types of chickens, etc.)

5. Invite the children to role play being chickens.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What body parts do we have that are similar to chickens?
- How are we different?
- How do people depend on chickens?
- How do chickens depend on people?

Extensions

- ***Dora's Eggs*** by Julie Sykes
- Students make multiple pairs of wings from cardboard and beaks from cardboard so they can all dress up as chickens.

Chicken Connections

WHAT'S THE **Big Idea?**
Cycles
Interdependence

Enduring Understandings

- All living things have needs.
- Food comes from nature: from plants and animals.
- People depend on chickens, and chickens depend on people.

Materials
Gather the following into a large bag:

- feather duster
- recycled "chicken nuggets" box
- chicken egg (either a real one in a carton, or a fake one)
- jar of water
- jar of oyster shells
- jar of crushed corn/chicken grain
- hand rake (used for gardening)
- some fake insects (either pictures or plastic)

Objectives

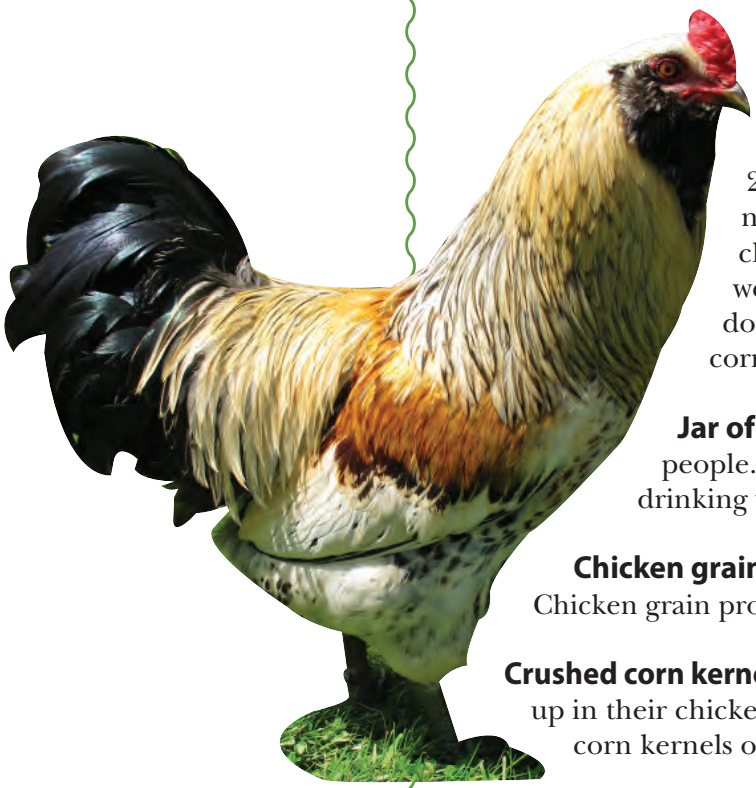
Children demonstrate an understanding of the food cycle.
Children consider how humans use chickens to meet our needs.

Directions

1. Ask students why a farmer would want chickens on his or her farm? As they share their answers, pull the corresponding product out of the bag:

Feathers: Ask students if they have ever helped to clean with a feather duster. Have they ever used a down comforter? See if any of the students are wearing a down coat.

Meat: Ask students if they have ever eaten chicken before. What are their favorite chicken recipes?



Eggs: Ask students if they've ever eaten eggs. Brainstorm what kinds of foods are prepared with eggs (cakes, cookies, quiche, some bread)

2. Ask students to brainstorm what a chicken needs to be healthy. If they have already seen chickens, what did they notice the chickens were eating? What do chickens spend their time doing? As students share their answers, pull the corresponding product out of the bag:

Jar of water: Chickens need to drink water just like people. Ask students if they have ever seen a chicken drinking water.

Chicken grain: Chickens need to eat food just like you and me. Chicken grain provides them with the nutrition they need every day.

Crushed corn kernels: Chickens love to eat corn! Usually it is crushed up in their chicken feed. (As an extension: have students grind corn kernels on a stump with a rock and feed it to chickens.)

Why do farmers raise chickens? For eggs, meat, and feathers (items at right). What do chickens need to be healthy? Water, grain, corn, and oyster shells, which have calcium for strong egg shells. Chickens also eat insects (some that can damage crops). They use their feet, represented by the hand rake, to scratch the ground for bugs. This also helps farmers aerate the soil.

Oyster shells: Chickens need vitamins and nutrients just like people. Oyster shells from the sea are fed to chickens to make their shells strong. Ask students if they have ever cracked an egg. Was it strong?

Insects: Farmers love chickens because they eat insects, many which are harmful for crops.

Hand rake: Ask students to describe a chicken's foot. Does it look similar to the rake? Chickens help the farmer to have healthy soil by "aerating" the soil with their feet as they scratch for food.

3. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- How do people depend on chickens?
- How do chickens depend on people?

VOICE *from the* FIELD

School Gardening with Young Children

Danielle Pipher

Danielle Pipher, M.Ed., Education and Professional Development Coordinator, Vermont FEED/Shelburne Farms

Gardens are one of the best teaching tools for early childhood educators. They offer some of the most meaningful hands-on education experiences to curious students who can actively participate in their food system from seed to plate. Gardens provide a cornucopia of nutritional, health, developmental, and academic benefits for children of all ages. Garden-based education and learning have been demonstrated to positively improve nutrition, academic success, and empower students to make healthier choices for themselves and their community. Gardens are also an ideal place for unstructured play and discovery, and for nurturing imagination and creativity.

Garden-based education can help reinforce healthy habits and attitudes. Exposure to a "living" classroom and learning environment can be incredibly empowering for students. Through working the soil, planting the seeds, tending the crops, and harvesting the food, students develop a sense of ownership, investment, and responsibility that can translate into learning academic and life skills that are both meaningful and practical.

Here are a few key tips to keep in mind:

Be patient and think creatively. There are many different paths to success. You might need to think outside of the garden box in order to make your site and plans fit your needs.

Build support. The more people who buy into a school garden project, the more successful it will be. Whether it starts with teachers, parents, or community members, it cannot succeed without all the stakeholders taking part in and supporting the process. It is helpful to include food service personnel as many garden and or preserve foods. The staff can offer ideas of what produce could be easily added into the cafeteria menu.

Determine goals. What will the garden be used for? How will it be connected with the curriculum, playscape, and school wellness initiatives?

Research and identify a safe, secure, and accessible plot ***(free from lead, heavy metals, etc.)***. You'll also want a site with adequate sunlight, water, and winter protection.

Student input into garden design is key! Student involvement in planning what will grow in the garden deepens their understanding of cycles, ecology, and sense of place. The garden should include space for students and classes to work, learn, and play with clear paths, identification, seating, and

places of discovery. Remember that gardens can be a magical for a young child—think about ways to enhance that experience with arbors, trellises, and climbing vines.

Student involvement throughout the process is vital. Students can start seeds in the classroom, learn about soil and compost, design garden beds, vote on themes, and brainstorm garden management plans. Most importantly, garden-based education lends itself well to spontaneous teaching moments that can be connected to most areas of academic study.

Plan for care of the garden. Taking care of a garden is a great opportunity for children to learn responsibility and care for other living things. Ask children what plants need to grow (see "The Fabulous Five," p.75). Discuss garden maintenance with students, and make a plan together for caring for your garden. Share the work, giving children a chance to rotate through all of the garden chores.

Changing culture happens slowly for schools, communities, students and faculty. Marketing and celebrating your hard work is critical to growing your program and increasing your exposure. Engaging students in taste tests of garden produce, asking for and integrating feedback, educating students about healthy choices, and using the garden as an experiential teaching tool is vital to the growth and long-term sustainability of your program.

Use Your Garden to Connect to Community:

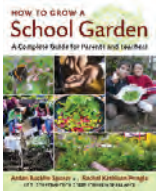
Consider planting a "Grow A Row"' to donate to the local food shelf. See www.americasgrowarow.org for more information and inspiration.

Consider inviting a local gardener to act as a community consultant as you plan and grow your garden, or opening your garden to families or the community. Offer plots or rows.

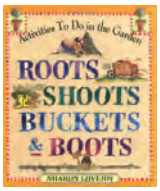
Invite a chef to help teach students, community members and staff how to turn the garden bounty into a harvest feast!

Take Advantage of Great Resources!

Check out these many fantastic resources that offer in-depth information on school gardens:



How to Grow A School Garden: A Complete Guide for Teachers and Parents by Arden Bucklin-Sporer and Rachel Pringle. *Timber Press, 2010.*



Roots, Shoots, Buckets & Boots by Sharon Lovejoy. *Workman Publishing Co., NY, NY, 1999.*

Kids' Container Gardening: Year-Round Projects for Inside and Out by Cindy Krezel. *Chicago Review Press, 2010.*

Digging Deeper: Integrating Youth Gardens Into Schools & Communities by Joseph Kiefer and Martin Kemple. *Common Roots Press, 1998.*

Sowing the Seeds of Wonder: Discovering the Garden in Early Childhood Education by Life Lab/ National Gardening Association, *2010.*

Garden Adventures: Exploring Plants with Young Children by Sarah Pounders. National Gardening Association, *2010.*

Websites for educators:
www.farmtoschool.org
www.farmtopreschool.org
www.kidsgardening.org

Digging In

WHAT'S THE **Big Idea?**
Interdependence
Community
Cycles

Materials

- a plot of tilled earth with soil that has been tested (soil testing kits are available online or check with your local gardening center) If you do not have the land available for gardening, use plastic containers and potting soil purchased at a local garden center or hardware store.
- kid-sized gardening tools
- seed catalogs
- seeds or transplants

Enduring Understandings

- We rely on each other and other living things to meet our needs.
- Food comes from nature: from plants and animals.
- Some of our food comes from gardens.
- Foods are harvested at different times of the growing season.

Objectives

- Children cultivate a garden.
- Children show interest and curiosity in how vegetables grow.
- Children discover the joy of growing food.
- Children experiment with planting different seeds and plants.

Directions

Gardening is a creative, expressive act, and there is not one right way to do it. If you are not a gardener, don't give up the idea. Ask for guidance from families who garden, the National Gardening Association Master Gardeners program, or other staff members at school. See p.202 for some key tips. Consider using a theme for your garden:

Pollinator Garden: Sometimes called a Butterfly Garden, this garden attracts pollinators, such as bees, bats, hummingbirds, and insects. Planting flowers that bloom throughout the growing season is ideal. Native plants will attract native pollinators. Do some research to find out which plants are native to your area, and make selections based on the type of pollinators you want to attract. Check out www.pollinator.org as a good resource.

Pizza or Salsa Garden: Brainstorm with children the vegetables and herbs they most like on their pizza or in their salsa, and then plant those varieties in your garden. See p.180 for more on making pizza truly from scratch—from crust, to cheese, to toppings!

Literacy Garden: Children's literature provides many themes for your garden. There are many ways to approach a literacy garden. Using a favorite book, you can recreate fictional gardens (think *Stone Soup*, *The Secret Garden*, *The Carrot Seed*, *Sunflower House*, *The Very Hungry Caterpillar,* or *Peter Rabbit* to name a few.) Another approach is to create a StoryWalk®, where pages from a children's book are transferred to a series of laminated pages on stakes located at stops along a walking route through the garden. (See www.vtbikeped.org/what-we-do/storywalk-project.html.) The StoryWalk® Project was created by Anne Ferguson of Montpelier, Vermont, and developed in collaboration with the Vermont Bicycle & Pedestrian Coalition and the Kellogg-Hubbard Library.

Herbal Tea Garden: Plant a variety of herbs to be used to make tea, such as mint, chamomile, lavender, or lemon balm. See "Herbal Delights," p.215 for more on making tea.

Rainbow Garden: Select vegetables or flowers tin each color of the rainbow, or select just one color. Conduct rainbow taste tests (see "Eating the Rainbow" in *Who Are We?* p.81).

Other ideas: Habitat Garden, Rain Garden, "Family" Garden (planting a variety of crops from the same plant family), "Three Sisters" Garden (a Native American companion planting of squash, beans, and corn).

Summer Garden Care

Many early childhood programs run year-round, providing a great opportunity to participate in the complete growing cycle. However, some programs run only during the school year, and this leaves those school gardens in need of care over the summer. Many sites have tackled this challenge, and yielded many solutions:

- **Invite families to adopt the garden for a week.** Ask them to weed, water, and bring home any bounty that is ripe during their week of care. It's helpful to provide an instruction sheet on garden care, easy access to water, as well as a reminder prior to their scheduled week.
- **Connect with camps.** If your site hosts any summer time afterschool programs or camps, connect with the educators running these programs to find out if they would be interested in tending your garden while they are on site.
- **Plant crops that are harvested in the fall**, such as winter squashes, beans, and potatoes.
- **Let the garden go to seed!** A small school in northeastern Vermont solved their summer garden care problem by letting the school garden go to seed. Students planted in the spring and then the garden was left to the mercy of nature. Teachers and families occasionally watered or weeded but for the most part the garden was left to itself. When school started in late August, all grade levels helped to harvest seeds, dry them, and package them into student-made seed packets. The packets were then sold as a school fundraiser.

Discussion Questions

- Where does food come from?
- Why do people grow gardens?
- At what time of year do we plant? Tend? Harvest?
- How is a garden a community?
- What do plants need to survive?

Paper Making

WHAT'S THE Big Idea?
Interdependence

Materials

- ***From Tree to Paper*** by Wendy Davis
- buckets
- wooded area with decaying trees
- rotten tree fibers (see directions for more details)
- blender that is no longer being used for food
- paper scraps
- 12" x 12" screen stapled on a wooden frame or duct taped around the edges, you can get creative and cut the screen into various shapes to make paper that is circular or diamond shaped, one per student
- plastic kitchen tubs
- newsprint
- sponges

Enduring Understandings

- Some plants provide other things besides food.
- Trees can be used to make paper.

Objectives

- Children show interest and curiosity in where paper comes from.
- Children discover that wood pulp can be turned into paper.
- Children experiment with ways to make paper.

Directions

On a hike in the woods with children (or if that is not possible go out on your own) find a dead, rotting tree. Try to crumble the inner tree with your hands. If you end up with a handful of a crumbly mass of fibers, you have the main ingredient to make paper!

1. Discuss with children where they think paper comes from. Many insist it comes from trees. Read *From Tree to Paper* and discuss the process explained in the book.
2. Invite your students to a papermaking challenge! If possible, hike into the woods where there are downed and decaying trees. Encourage students to try to scrape off handfuls of the rotting wood and collect it in buckets.
3. On returning to your classroom, soak the decomposing wood in water, just enough to cover the wood. Students should occasionally stir it with a wooden spoon or squeeze it with their hands to break down the fibers. Soak overnight for best results.
4. Once the fibers are soaked and in pieces of an inch or smaller, place two cups of this mixture into the blender along with two to three cups of water. Process the fibers and water in the blender for several seconds, reducing the fibers to a pulp with an oatmeal-like texture. The water and pulp combination is called slurry. If the slurry appears too dry, add small amounts of water to get it to runny oatmeal consistency.
5. Fill the plastic kitchen tubs ¾ full with the slurry. This is the main ingredient of paper. Have a student stir the slurry to keep the pulp particles suspended in the slurry and not sink to the bottom. Another student should lower a screen into the slurry and slowly raise it up, keeping the screen as flat as possible so it catches the pulp. If the pulp is too runny, drain off some of the water and try again. If it is too thick, dump it back into the tub, add more water and try again.
6. Hold the screen over the tub for a few seconds to allow the excess water to drip off. Take the screen and quickly and carefully flip the

screen over onto several thicknesses of newsprint.

7. Keeping everything in place, sponge off excess water from the screen until the paper feels fairly dry. The water will drain, leaving the pulp to dry into paper.
8. When the new sheet of paper is dry enough (may take several hours), it will separate readily from the screen and remain attached to the newsprint. Slowly lift one corner of the screen. If the screen and paper pulp separate, gently lift the screen from the paper. If the paper pulp and screen stick together, sponge off more water.
9. Set the new sheet of paper aside, still attached to the newsprint, in a safe place to dry.
10. While the paper is still damp, it may be covered with a piece of smooth cloth and ironed (with the assistance of an adult).
11. When the paper is fully dry, peel the newsprint off and think of ways to use your new sheet of paper!
12. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Why is your paper the color it is?
- What other steps do you think need to happen to make paper like the paper you use in school?
- What other things can trees provide for humans?

Important clean-up note:

Do not put extra paper pulp down the drain as it will clog the drain. It can go in the compost or garbage.

Extensions

- Gather other natural objects on your hike such as wild flowers, pine needles, or leaves to use to decorate your homemade paper. Soak the natural objects overnight in a separate bucket of water. These soaked natural objects can be added to the slurry just before dipping the screen.

Shear Delights

WHAT'S THE **Big Idea?**
Cycles

Materials

- ***Charlie Needs A Cloak*** by Tomie dePaola
- sheep fleece: Buy clean or dirty fleece online or from a local sheep farmer. www.pitchfork.org sells raw, dirty fleece and www.zwool.com sells clean roving for spinning or felting batt for felting projects.
- small "J hooks:" Cut metal coat hangers at the curve, leaving a 4-inch straight handle. You can get two out of one coat hanger.

Enduring Understandings

- We rely on each other and other living things to meet our needs.
- Some plants and animals provide us with products other than food.
- Sheep provide a fiber, called wool, that can be used in many ways.
- Sheep fibers are spun to make yarn.

Objectives

- Children can demonstrate how to spin wool into yarn.
- Children experiment different ways to spin wool into yarn.
- Children play with sheep fleece.

Directions

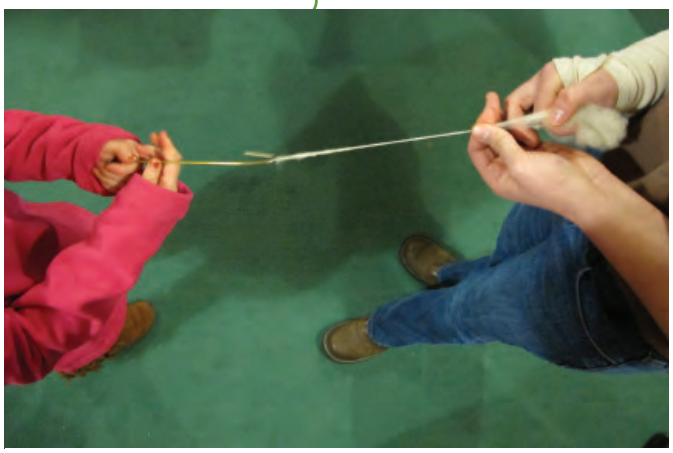
The "spinner" (*left*) hooks wool onto the j-hook and slowly spins the hook (always in same direction) to twist the wool fibers.

The "handler" pinches the wool with one hand and gently pulls towards her with the other to stretch the wool into just a few strands.

1. Read *Charlie Needs A Cloak* by Tomie dePaola. Discuss the process Charlie used to create a new cloak. Your students will now try turning wool into yarn. Explain they will not make enough yarn to make a cloak but they could make a bracelet or necklace.
2. Demonstrate the process with a student (explained below steps 3–10), then have each student find a partner.
3. Each pair of students must gently stretch a piece of carded fleece until the individual fibers are spread out as much as possible so they each have a piece of fleece to turn into yarn.
4. Have partners sit facing one another. One student in each pair takes an edge of the fleece, hooks it on the curved end of his wire J hook, then holds the hook by the straight end. This person is the "spinner."
5. The other partner, "the wool handler," pinches the fleece close to the wire hook, using the thumb and index fingers of her left hand. With the thumb and index fingers of her right hand, she gently pulls the rest of the wool towards her until she has stretched out a section of fleece to just a few strands thick.
6. Now the spinner starts spinning his tool, remembering to twist in the same direction and continuing to spin until the pair decides to stop.
7. The wool handler will release and slide her

pinching left hand back to meet her right hand, then pinch again. As the spinner continues to spin, the length of stretched wool should twist up and look like a piece of yarn. The key to spinning is to feed very few strands of fibers at a time to the spinner.

8. The wool handler should repeat steps 4 and 6 (pinching and sliding with the left hand, teasing and pulling with the right) until the yarn is the desired length. The students will need space to move further and further away from each other as the yarn gets longer between them.
9. As soon as the yarn has reached a desired length, the students can stop spinning and feeding. The spinner removes the newly spun yarn from the hook and holds on tightly to the end. The handler places her index finger in the middle of the length of yarn and folds the yarn over it. The spinner should take this other end and hold on tightly to both ends. The newly spun yarn should naturally wrap around itself.
10. Tie to make a bracelet or necklace. Add beads or charms if you want.
11. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.



As the pair spins, the stretched wool will twist into a piece of yarn and get longer, and the team will get further away from each other.

When the yarn is the desired length, the handler folds the yarn back on itself, and hands her end to the spinner.

The yarn will naturally wrap back on itself. It is now ready to be tied into a bracelet or necklace. (Add beads, too, if you want!)

Discussion Questions

- Where does wool come from?
- What can you think of that is made of yarn?
- What are some other products we get from plants or animals that aren't food?

Extensions

- ***Pelle's New Suit*** by Elsa Beskow
- Obtain fleece from a farmer, have children feel, touch and smell it. What's on their hands after feeling the fleece? An oil, called *lanolin*, which is used in hand lotion. It helps keep the sheep dry and warm.
- Set up washing and rinsing buckets for children to wash the dirty fleece. Swish a handful of dirty fleece through warm, soapy water. Do not scrub the fleece; that will make it felt together. Swish in the rinse water, squeeze out excess water and hang to dry. We drop the wet wool into an old salad spinner and give it a few spins before hanging it on a line to dry.
- Dye the wool to create different color yarn. See "Natural Dyes" in *Who Are We?*, p.62.

Super Soil Explorations

WHAT'S THE **Big Idea?**

Change over Time

Materials

- ***And The Good Brown Earth*** by Kathy Henderson
- plastic jars with lids
- samples of dry gravel, sand, silt, and clay
- samples of plants, such a bean plants, marigolds, etc.
- planting containers

Enduring Understandings

- Soil is the upper layer of the earth in which plants can grow.
- Soil is created as rocks and minerals change over time. Therefore not all soil is the same. It depends on where it is located and what parent rocks contributed to its origin.
- The combination of the different size particles and minerals make soils unique.
- Soil is vital for all living things.

Objectives

- Children show interest and curiosity about soil.
- Children experiment with different types of soil to grow plants.
- Children play with soil.

Great Teacher Resource!

Healthy Foods from Healthy Soils by Elizabeth Patton & Kathy Lyons. *Tilbury House, Garrdiner, ME, 2003.*

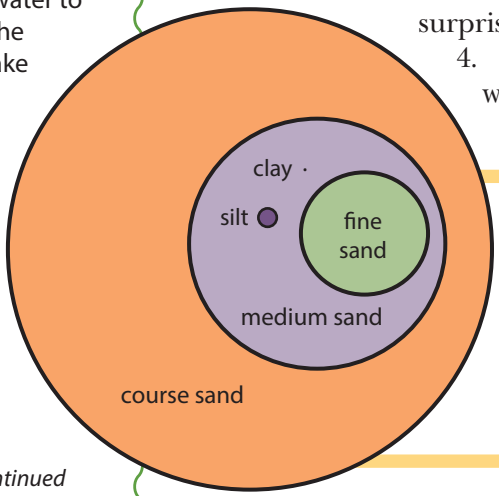
Directions

1. Read *And the Good Brown Earth* by Kathy Henderson. Discuss with your students the role soil plays in their lives. (Consider connecting this experience with "Soil Recipe" in *What's Happening?* p.157.)
2. Ask children: Is all soil the same? Have students bring in samples of soil from their homes or dig up samples from various spots in the schoolyard. Examine these samples using magnifiers. Write down descriptions of the findings.
3. Have each child place a tablespoon of soil from his or her sample into a plastic jar, add water almost to the top and place the lid onto the jar. Shake the jar and record what happens. If possible, take a photo of each jar and save for the student's report. What fell to the bottom first? Is anything floating? Why? Did anything surprise you in this experiment?
4. Have students make predictions of how long it will take to have all the particles settle out of the

Extensions

- Test soil to determine how much clay is present. Collect a handful of soil and add enough water to make a ball with the soil. If you can make a ball, try to roll the ball into a snake shape. If you can make a snake shape, you'll know your soil contains clay! Fine clay particles adhere when they are moistened.

continued



Clay, Silt, and Sand

If clay were the size of a dot on this page, this graphic shows what the comparative sizes of silt and sand would be. Clay particles are pretty tiny!

water and fall to the bottom of the jar. Since clay is the smallest particle, it will take the longest to settle and the water will remain cloudy until the last clay particle has settled to the bottom.

5. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What surprised you about the experiments?
- Why was it helpful to have a combination of particles not just all the same type?
- What are you wondering about soil now?
- Why is soil important?

- Have students take a handful of dry soil they have dug up in the schoolyard or from another location. Place it into the top layer of a soil screen sieve. Place the lid on and gently shake. Open each layer of the sieve to observe particle size. Place the contents of each layer of the sieve onto a different piece of paper or paper plate. Feel the particles, add water to the particles, how do they react? Soil sieves can be purchased from The Acorn Naturalist: **www.acornnaturalist.com**
- Add water to a small yogurt container of sand, dump it out to make a small sand sculpture. Add water to dry clay, stir it, dump it out to form a small clay sculpture. Predict what will happen if you let both sculptures dry. Let them dry and record the results.
- Soil is comprised of different-sized particles. Does this make a difference in how things grow? As a class or in small groups, plant the same plant, such as bean plant, in a potting container of just one of the particles, for example, all clay. Add water and keep a record of how the plant grows compared to the one planted in only sand, or gravel or silt. Water the plants at the same time with identical amounts of water. Have students make predictions of what will happen. Record findings.
- Make potting soil! See "Mix It Up: Make Potting Soil" (Appendix, p.253).

Farmers' Market Learning Journey

WHAT'S THE **Big Idea?**

Community Interdependence

Materials

- ***Farmers' Market*** by Paul Brett Johnson
- transportation to get to a local farmers' market

Enduring Understandings

- We rely on each other and other living things to meet our needs.
- Food comes from nature: from plants and animals.
- Farmers provide food that comes from both plants and animals.
- Some farmers sell their products at farmers' markets.

Objectives

- Children show interest and curiosity in the different types of products a farmer grows and sells.
- Children discover that not all farmers grow the same products.
- Children play being a farmer at the farmers' market.

Extensions

- Set up a Farmer's Market stand in your classroom. Use the housekeeping corner, or set up a table with some baskets of plastic and real vegetables and fruits for the children to sell and eat at the market.
- ***I'm Going to Be A Farmer*** *(Read With Me/I'm Going To Be)* by Edith Kunhardt
- ***To Market, to Market*** by Nikki McClure

Directions

1. Read *Farmers' Market* by Paul Brett Johnson. Discuss how the children in this family have a job selling their family's produce at the Saturday farmers' market.
2. Ask if anyone has been to a farmers' market? What did they see? Did they buy anything?
3. Research where a farmers' market is in your community. Discuss how the students could get to the market and what they might purchase to cook in the classroom.
4. Make plans to ride a school bus, use public transportation, take private cars or walk to a local farmers' market. As a class, decide what vegetables or fruits might be available at this time of year and decide on a dish to make as a class with produce from the market.
5. Brainstorm other things your class thinks they may see, hear, or smell at the market, such as, farm animals, trucks, herbs, and of course various fruits and vegetables. Create a scavenger hunt based on their suggestions.
6. Attend a market. Give groups of children a scavenger hunt and a list of produce they need to get for the class recipe. Have plenty of chaperones so small groups will be able to go off to explore the market. Determine a meeting time and place before heading off.
7. After their exploration of the market, gather to share what they saw, smelled, and heard. Check to make sure all the ingredients were purchased for the class dish and head back to school.
8. Back at school, use the produce to create your dish or save for an upcoming day. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- What did you see, hear, and smell at the market?
- What surprised you about the market?
- What did you think was missing from the farmers' market?
- Where else do farmers sell their products?

Ice Cream Making

WHAT'S THE **Big Idea?**
Interdependence

Enduring Understandings

- Food comes from nature: from plants and animals.
- Milk comes from cows.
- Milk can be turned into many different food products.
- Milk is used to make ice cream.

Objectives

- Children show interest and curiosity in how ice cream is made.
- Children discover the ingredients of ice cream.
- Children experiment with ways to make different flavored ice cream.

Directions

1. On a hot day, homemade ice cream can cool you off in several ways. Discuss with children their favorite flavors of ice cream... vanilla, chocolate, strawberry—the selections are endless. Discuss their ideas on how this cool, sweet treat is made.
2. Read *Ice Cream: The Full Scoop* by Gail Gibbons with students. Discuss how ice cream production has changed over time.
3. Create an ice cream recipe as a class or in teams of 2 to 3 children. Compare children's recipes to the following recipe:
   - 1 cup milk
   - ½ cup heavy cream
   - ½ teaspoon vanilla (or flavoring of your choice)
   - 1 tablespoon of sugar or honey or maple syrup
4. The class or small groups can decide on a flavor recipe they would like to try. Then help each child or group mix all of the ingredients in one of the quart-sized bags. After getting most of the air out of the bag, help them seal the bag with duct tape to ensure none of the salt water gets into the ice cream mixture. Place the quart bag into another quart bag for additional protection and seal it, again, removing most of the air, and duct tape closed. Place the double-bagged mixture into a gallon bag, fill with ice, add four tablespoons of salt, remove air, seal, apply duct tape, and begin to massage the bag. Gloves or mittens are recommended because this really gets cold!

Materials

- ***Ice Cream: The Full Scoop*** by Gail Gibbons
- winter mittens or gloves
- ingredients to make ice cream (see recipe card)
- supplies to make ice cream:
  - ice
  - salt
  - quart- and gallon-sized resealable plastic bags
  - duct tape

Why Add Salt?

Ice melts by absorbing heat (energy) from its environment. When you add salt to ice, it lowers the ice's "freezing point," meaning that it will take even more heat to melt the ice. The ice will take that extra heat from the ice cream ingredients, which allows the milk mixture to freeze into ice cream.

Ice Cream

INGREDIENTS

1 cup milk
½ cup heavy cream
½ tsp. vanilla or other flavoring such as strawberries or chocolate sauce
1 tbsp. of sugar or honey or maple syrup

INSTRUCTIONS

1. Mix all of the ingredients in one of the quart-sized bags.
2. After getting most of the air out of the bag, duct tape the bag closed to ensure none of the salt water gets into the mixture.
3. Place the quart bag into another quart bag for additional protection. Again, remove most of the air and duct tape it closed.
4. Place the double bagged mixture into a gallon bag, fill with ice, add 4 tbsp. salt, remove air, seal, apply duct tape and begin to massage the bag. Gloves or mittens are recommended because this really gets cold!
5. Shake, massage, and toss the gallon bag for about 10–15 minutes or until you can see and feel the mixture is getting harder. Cut off the tape, carefully pour your ice cream into a bowl and enjoy!

Extensions

- Add a dried herb, such a mint, to the mixture to create a mint ice cream.
- If you can get a hand-cranked ice cream maker, try making a larger batch. The bags allow for a more hands on experience for all children since there is no waiting in line for a turn to crank. Check Lehman's at www.lehmans.com.
- Have children design an ad or carton for their ice cream before making it. If teams make different flavors have a taste test after the ice creams are made to determine the favorites.
- Invite parents to an ice cream social and they can help their children make ice cream as the children explain the science behind it.
- ***Milk to Ice Cream*** *(Welcome Books: How Things Are Made)* by Inez Snyder
- ***From Cow to Ice Cream*** by Bertram T. Knight

5. Shake, massage, toss the baggies for about 10–15 minutes, or until you can see and feel the mixture is getting harder. Cut off the tape from the large bag, wipe off the salt from the quart-sized bags, carefully pour your ice cream into a bowl and enjoy! Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Why did we add salt to the ice cream?
- Why is salt put on icy roads?
- How will melting ice be helpful in making ice cream?

Herbal Delights

WHAT'S THE **Big Idea?**

Interdependence
Cycles

Enduring Understandings

- Food comes from nature: from plants and animals.
- Knowing where our food and fibers come from is important to understanding the relationship between humans and the natural world.
- Herbs add flavor to foods.

Objectives

- Children show interest and curiosity in trying different teas.
- Children discover that herbs add flavor to foods and teas.
- Children experiment with different herbs when making tea.

Directions

If you have grown herbs in your school garden, pick them, tie them in a bunch, and hang to dry for one to two weeks in a dry, out of the way, location. If you have not grown any herbs, ask parents if they have any they've grown that they will share. If you cannot get fresh herbs, buy dried herbs in bulk at a health food or grocery store.

1. Have the children crush the dried herbs into bowls with their fingers, using a separate bowl for each herb. Ask the children how the herbs smell, and ask if they can describe something else that might smell like that (i.e., peppermint smells like candy canes, lemon balm like lemons)
2. Ask the children for ideas on how they could use herbs. Have they ever used them at home? Seen anyone in their family use them? Discuss how when herbs are used in cooking they add flavor to our food. They can also add fragrance to soaps or candles. Or they can be used to make tea. It might be helpful to have a basket with some products that have herbs in them.
3. Explain that the children will be making tea with dried herbs. Using a resource, such as *The Complete Medicinal Herbal: A Practical Guide to the Healing Properties of Herbs* by Penelope Ody, talk about how certain herbs can help our bodies in specific ways. For example, chamomile relaxes us, peppermint helps with digestion. Encourage students to think about what herbs they would like to use and why.

Materials

- dried herbs such as peppermint, spearmint, chamomile, or lemon balm (from your school garden, or purchased from a natural foods store or herb store)
- bowls
- sealable tea bags (the ones you iron on one end are ideal)
- iron
- measuring spoons for scooping the herbs into the tea bags
- paper to fold and decorate the tea bag wrapper

Great Teacher Resources!

The Complete Medicinal Herbal: A Practical Guide to the Healing Properties of Herbs by Penelope Ody. *Dorling Kindersley, Inc., NY, NY, 1993.*

A Kid's Herb Book for Children of All Ages by Lesley Tierra. *Author's Choice Publishing, 2000*

Walking the World in Wonder: A Children's Herbal by Ellen Evert Hopman. 2000

Extensions

- Make "Sun Tea." Pick 3–4 big bunches of fresh mint and put in a big glass jar with 5–6 decaf black tea bags (optional). Place in a window in direct sunlight for several hours to brew. Herbal tea bags bought at the store can also be used to make sun tea with a large variety of flavors. Sweeten if desired, and serve it up with a fresh garnish of mint or edible flower for added herbal delight!
- Herbs can be added when making butter or ice cream.

4. Have the children scoop approximately one to two teaspoons of herbs into their tea bags. It is fun if you have a few different herbs for them to create their own special combinations! Work with each student to iron the open end of the tea bag closed.
5. Invite the children to make packages for their tea bag. Cut and fold the paper to create a package for each tea bag, stapling or taping the sides. Decorate the package, slip the bag inside and close with a sticker or tape. Children can take their tea bags home to share with their families.
6. Process and reflect on the experience with the children by engaging in a conversation guided by the discussion questions.

Discussion Questions

- Where did the herbs we used to make tea come from?
- What did they herbs smell like?
- What else have you used herbs for?

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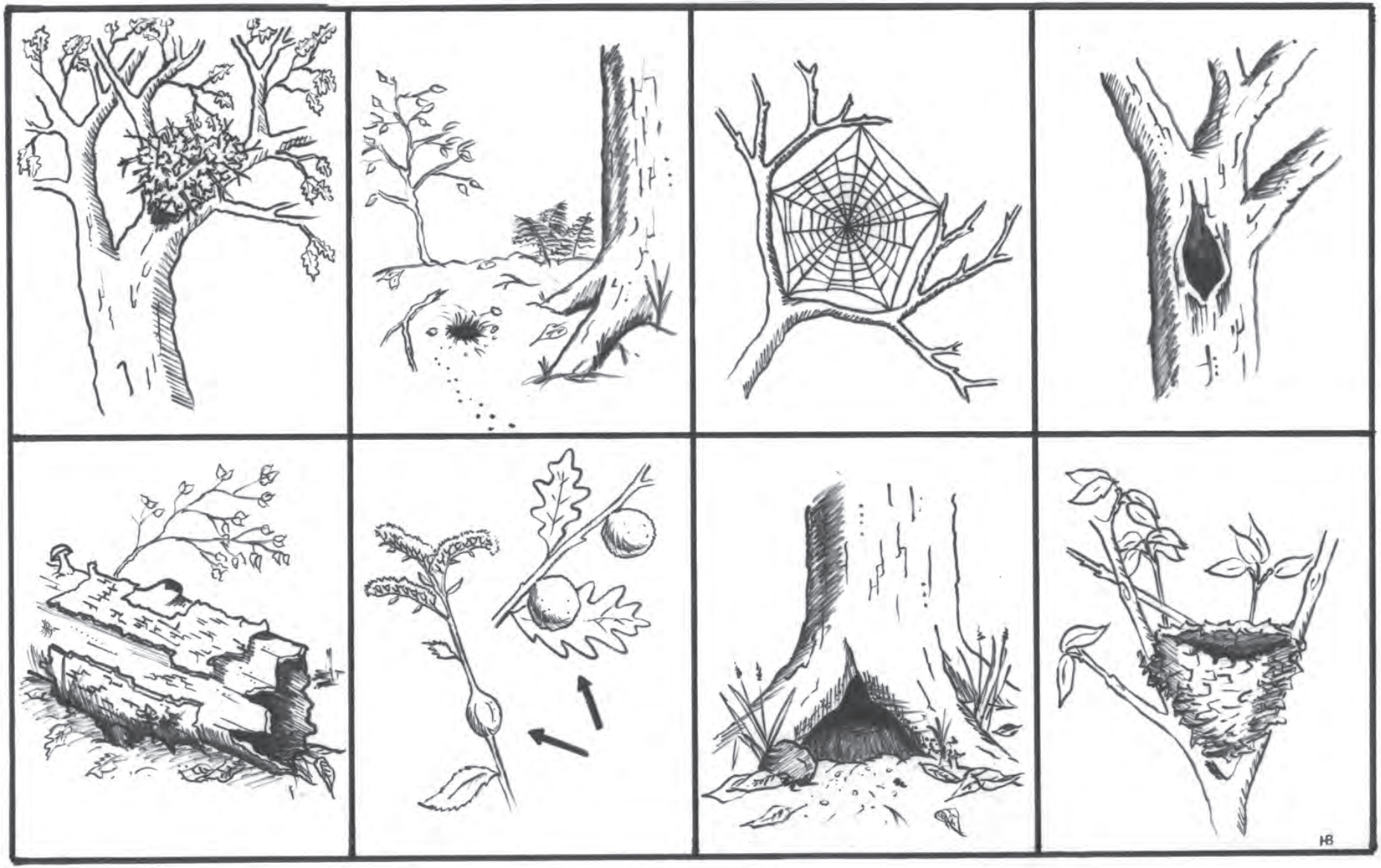
Animal Homes



Community Songs

Our Community

Sung to: "I'm a Little Teapot"

We are all a part of a community
With our friends, neighbors and families
When we get together we eat and play
We help each other in every way

Community Song

Sung to: "London Bridge is Falling Down"

Our classroom is a community, community, community
Our classroom is a community,
We help each other learn.

Our school is a community, community, community
Our school is a community,
We work and play together.

Our neighborhood is a community, community, community
Our neighborhood is a community,
We live close together.

We belong to many communities, communities, communities
We belong to many communities,
What community do you belong to?

Community Helper Song

Sung to: "Farmer In the Dell"

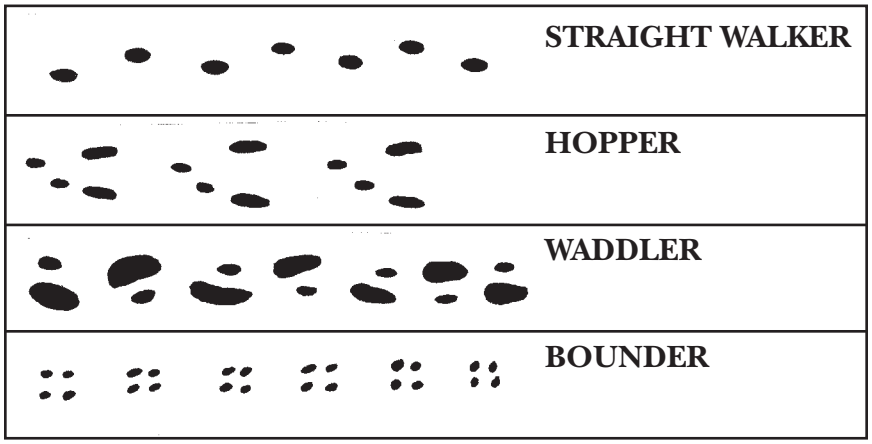
The doctor makes us well.
The doctor makes us well.
Hey! Ho! What do you know?
The doctor makes us well.

Continue with other verses.
The farmer sows the field . . .
The chef cooks the food . . .
The mailman brings the mail . . .
The firefighter puts out fires . . .
Policemen keep us safe . . .

Track Patterns

Okay, Track Detectives, you are on your own! Use the secret code, and in dirt, mud, or snow, identify tracks wherever you go!

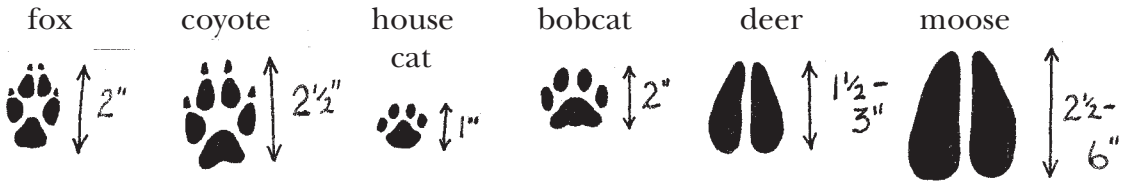
First, what **PATTERN** *are the tracks in?*



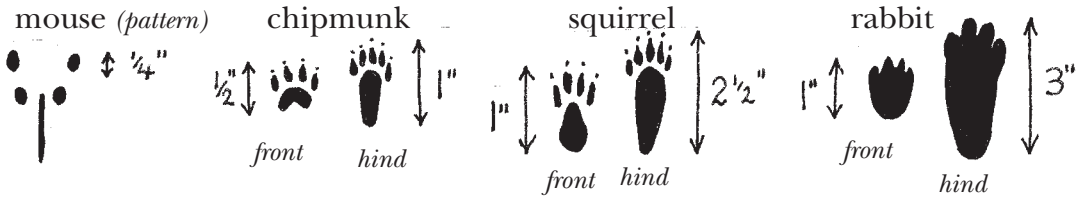
What **PLACE** *are they found? Remember to look for homes, leftover food scraps, and other clues such as feathers, fur, blood, scat, etc. left at the scene.*

Now check the **PRINT** *of the animal's foot. Notice the overall shape, measure its size, note the presence or absence of claws, and count the number of toes.*

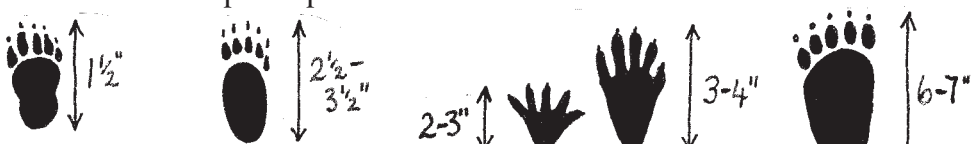
STRAIGHT WALKER



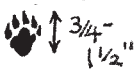
HOPPER



WADDLER



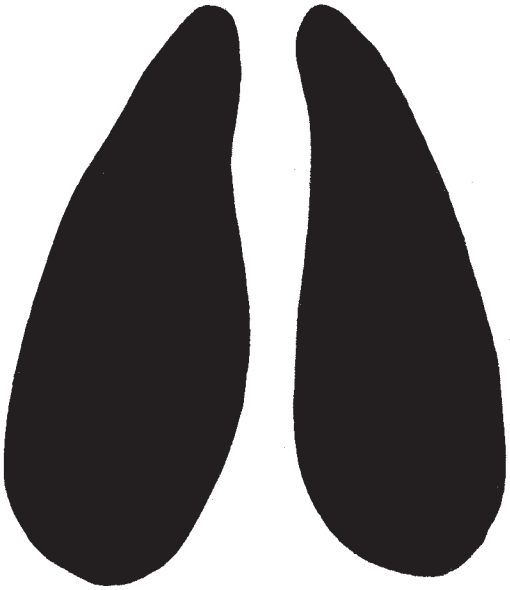
BOUNDER



Source: Project Seasons

Forest Animal Track Templates

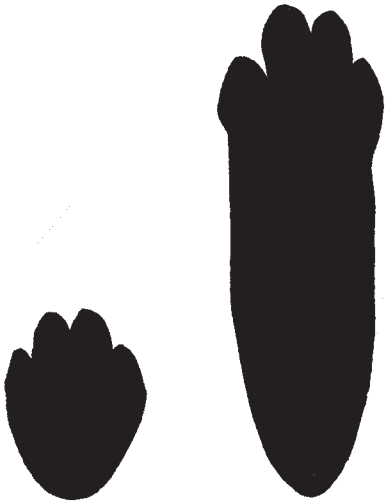
DEER



SKUNK

FOX

RABBIT



forefoot *hindfoot*

WEASEL

PORCUPINE

MOUSE
(pattern)

Source: PROJECT SEASONS

Forest Animal Track Templates

COYOTE

RACCOON

forefoot

hindfoot

CHIPMUNK

forefoot *hindfoot*

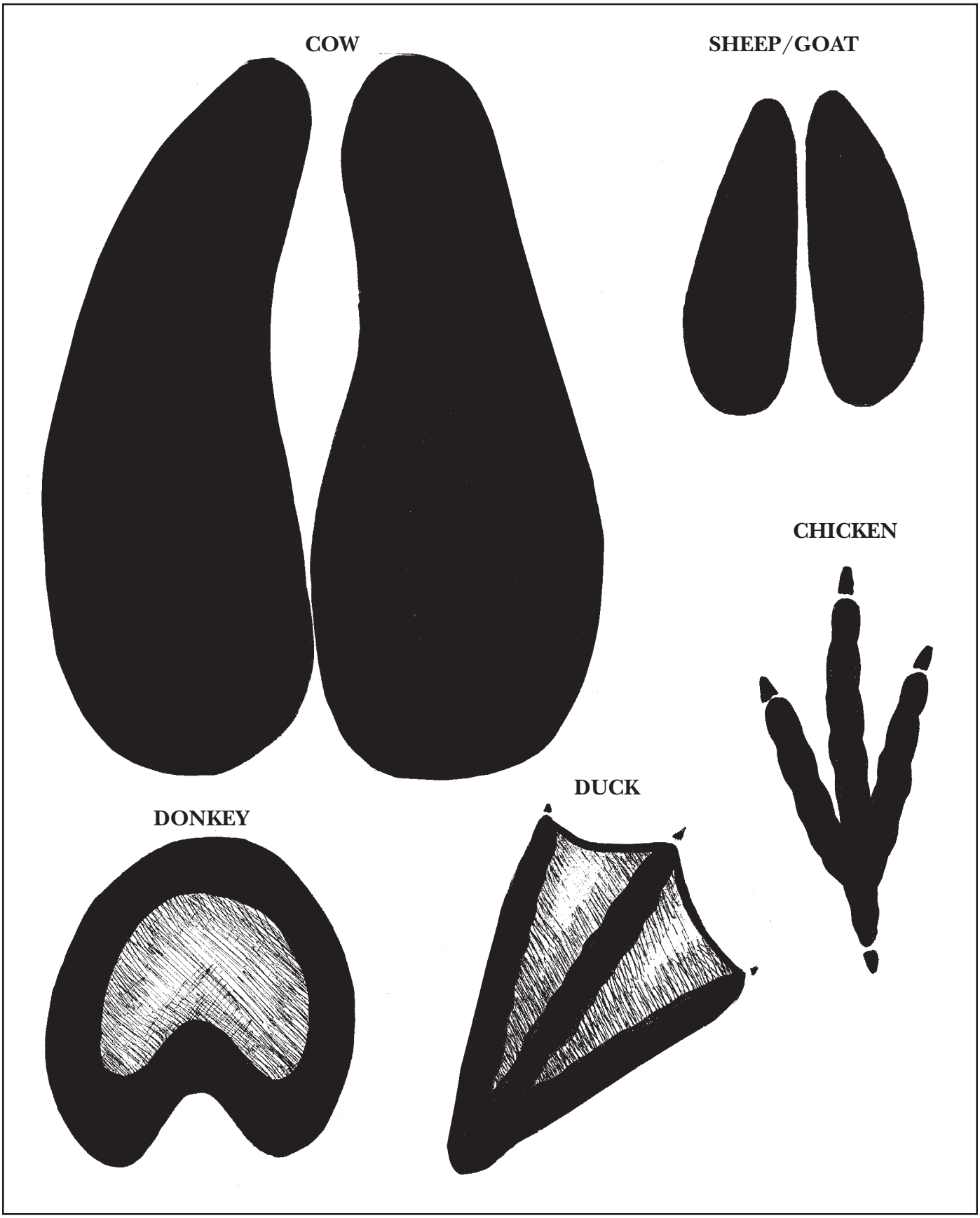
BOBCAT

GREY SQUIRREL

forefoot *hindfoot*

Source: Project Seasons

Farm Animal Track Templates



Source: Project Seasons

Winter Animal Cards

chipmunk

rabbit

woodchuck

warbler
(chestnut-sided)

Illustrations: Holly Brough

Winter Animal Cards

gray squirrel

red fox

porcupine

white-tailed deer

Illustrations: Holly Brough

Winter Animal Cards

skunk

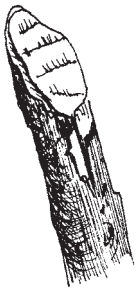
mouse

bobcat

racoon

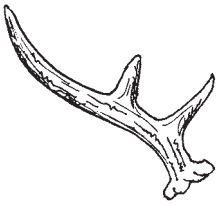
Illustrations: Holly Brough

Animal Signs in Winter

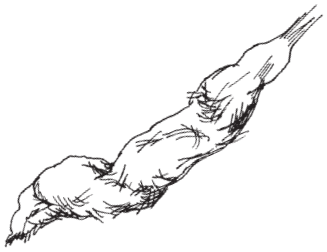
Look for the ends of twigs that have been gnawed, nibbled, or snapped off.



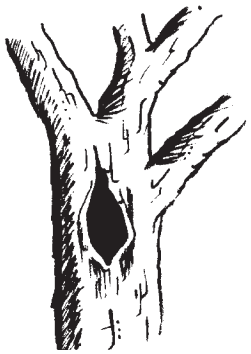



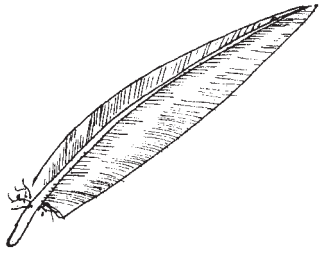
Look for bark that's been gnawed or stripped off, or the remains of nibbled nuts.






Look for poop! Animal poop (scat), can help us identify the animal and what it's been eating.

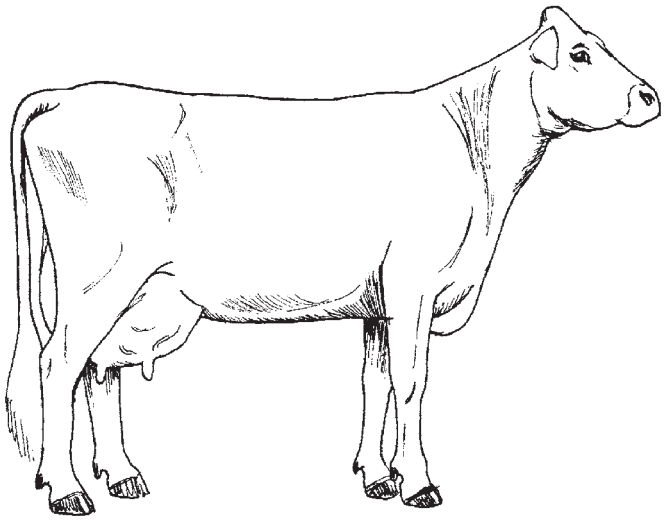


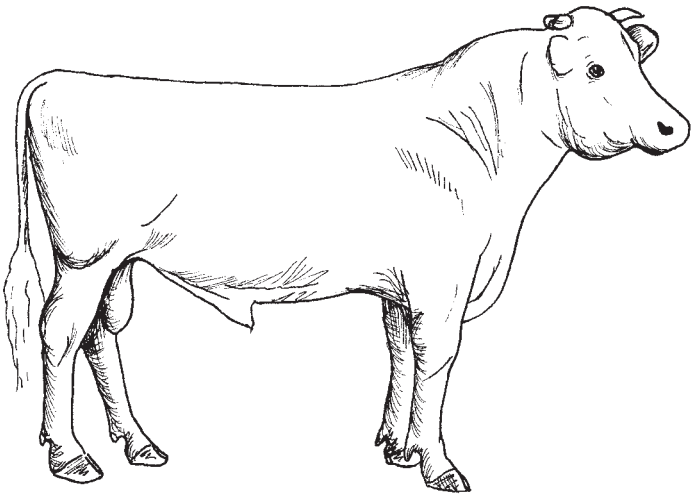
Look for animal homes.

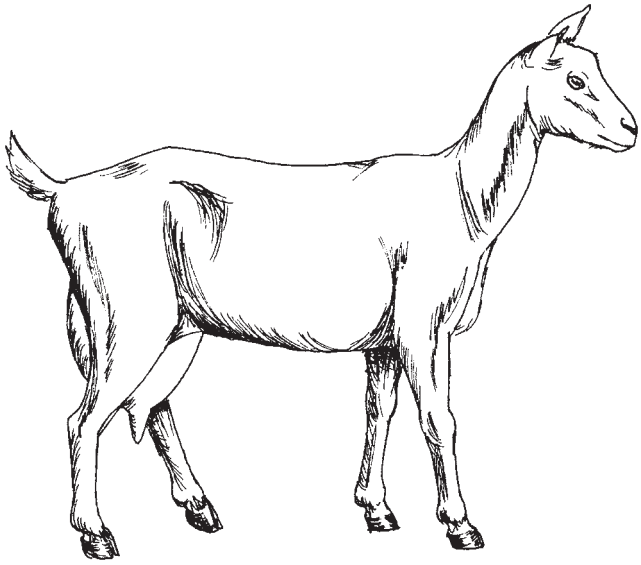
Illustrations: Holly Brough

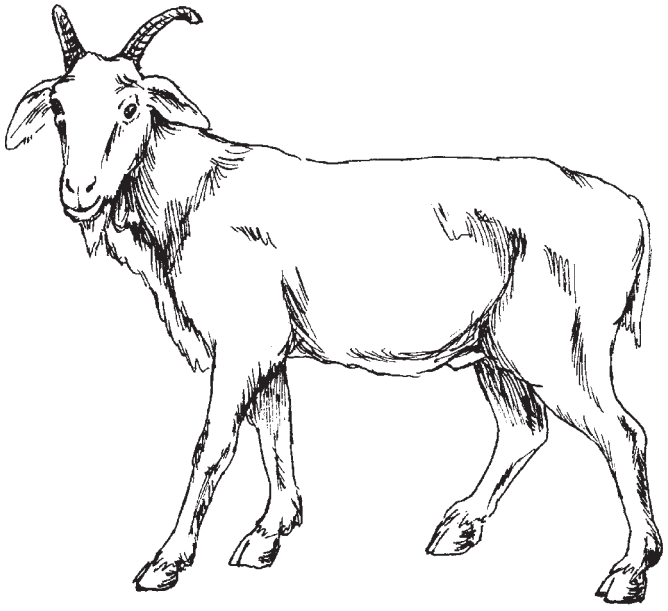
Farmyard Animal Cards

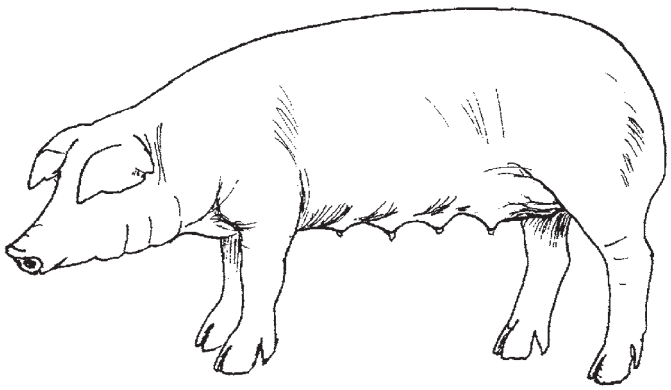
females **males**

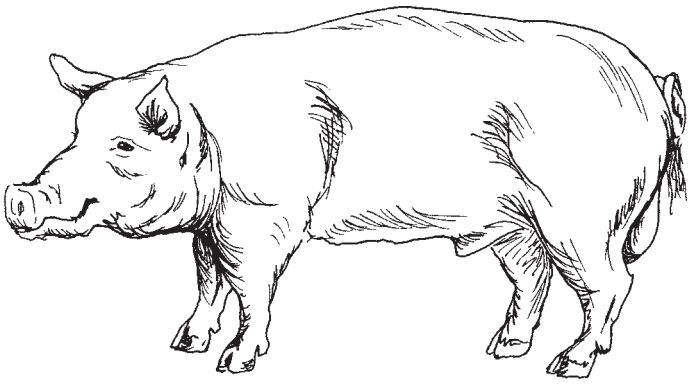








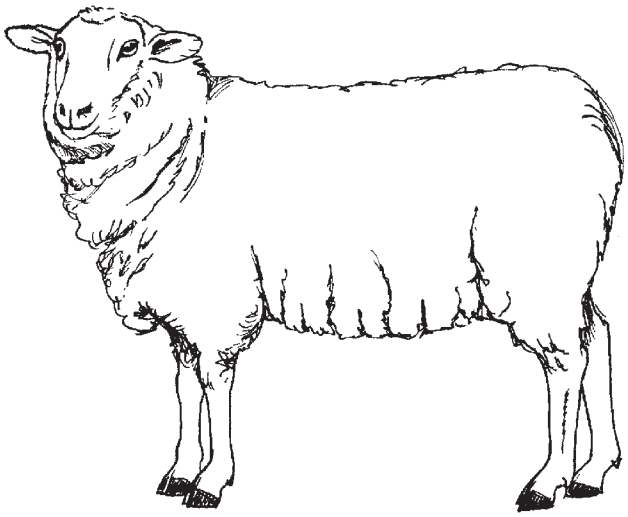


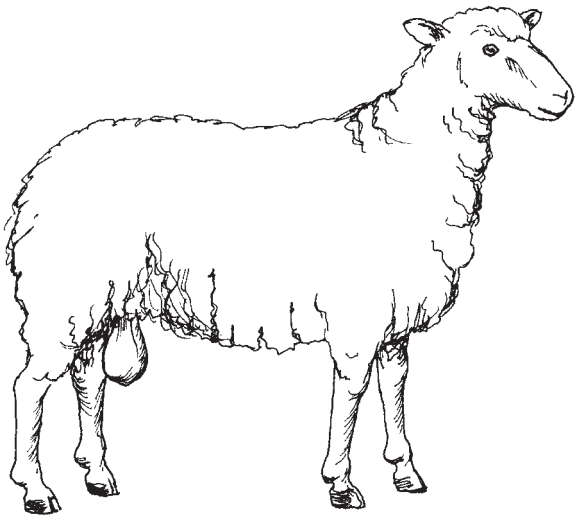


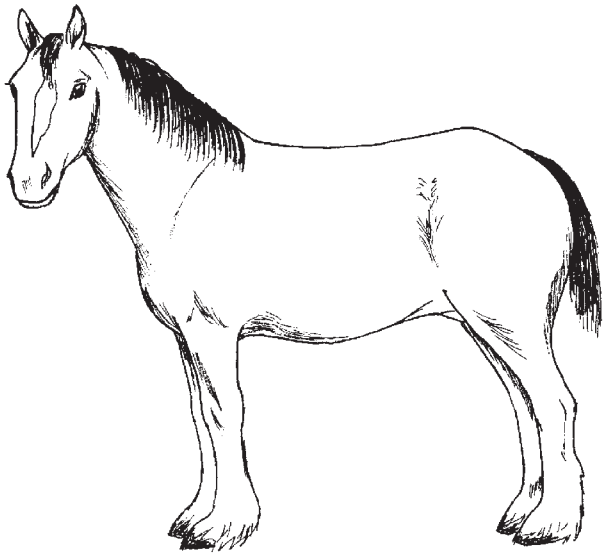
Illustrations: Holly Brough

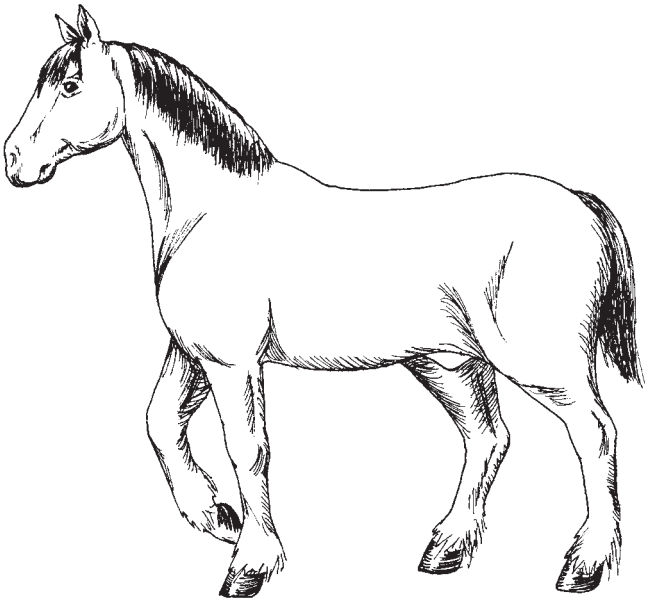
Farmyard Animal Cards

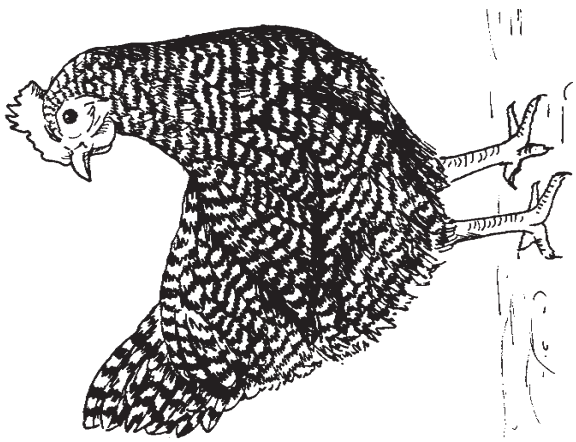
females **males**

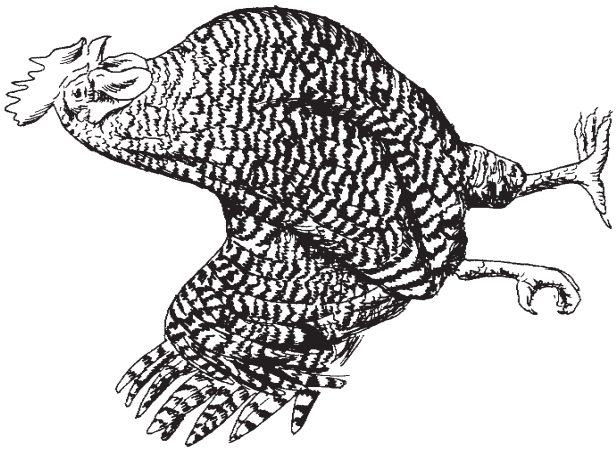








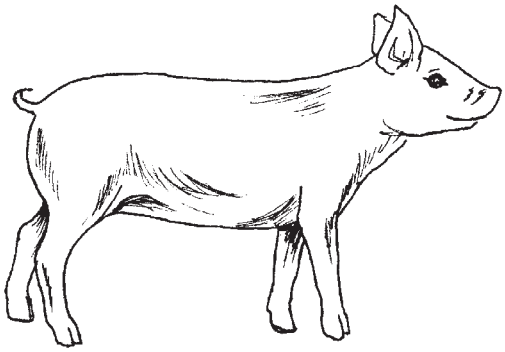


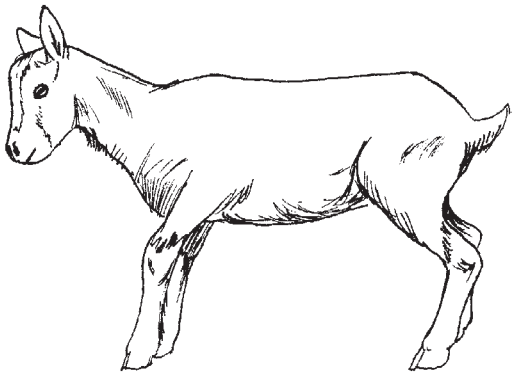


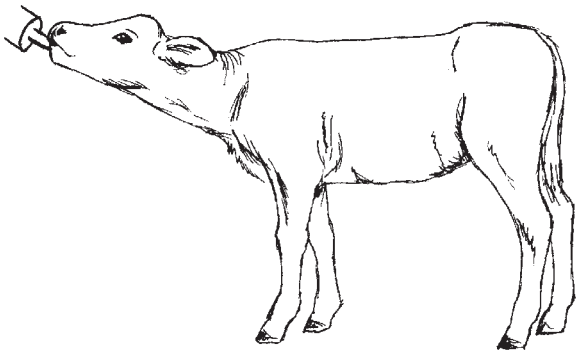
Illustrations: Holly Brough

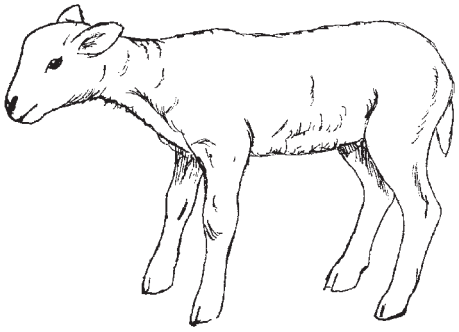
Farmyard Animal Cards

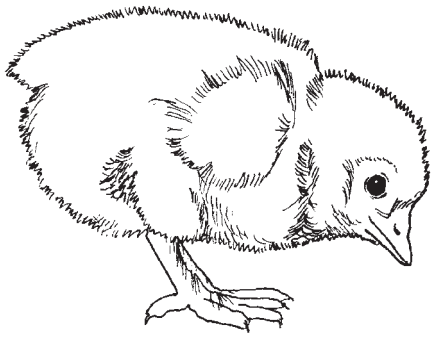
babies!

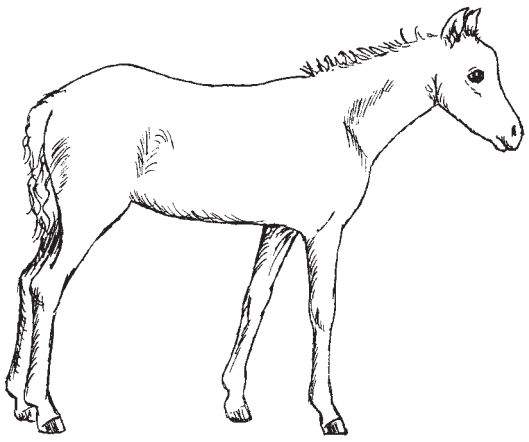






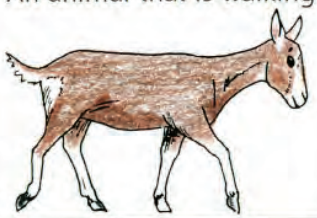
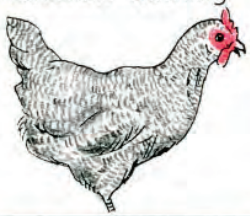
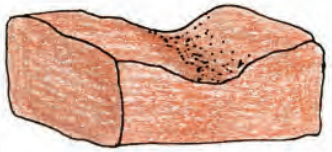
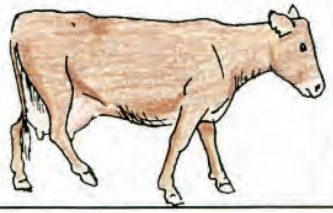
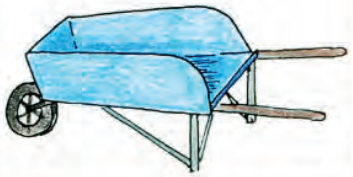






Illustrations: Holly Brough

MOTION, MUSIC & MANNERISMS: A Farm Animal Scavenger Hunt!

MOTION	MUSIC	MANNERISMS	ANIMAL PRODUCTS	MYSTERY
An animal that is walking 	A chicken "clucking" 	An animal chewing its cud 	Fleece from the sheep 	A tool to brush the cow 
An animal moving quickly 	A sheep "baaaing" 	An animal drinking 	Feather duster 	A salt lick 
An animal that is swimming 	A pig "snorting" 	An animal sleeping 	Manure 	A sign that tells you not to touch the fence! 
An animal moving on 2 legs 	An insect "buzzing" 	An animal scratching itself 	An egg 	A tool to move manure 
An animal moving on 4 legs 	A farmer "talking" 	An animal eating hay 	Milk 	A wheelbarrow 

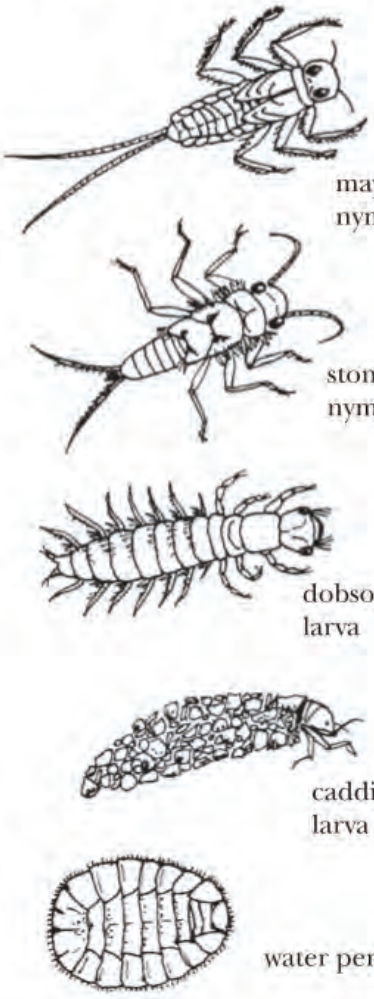
Illustrations: Holly Brough

Artwork by Holly Brough

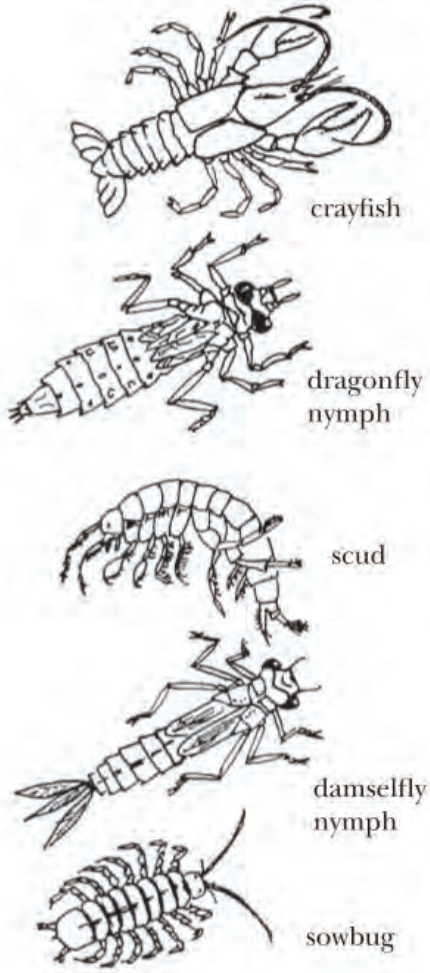
Water Critter Chart

The water critters that you find in any pond or stream are clues to the health of that water ecosystem.

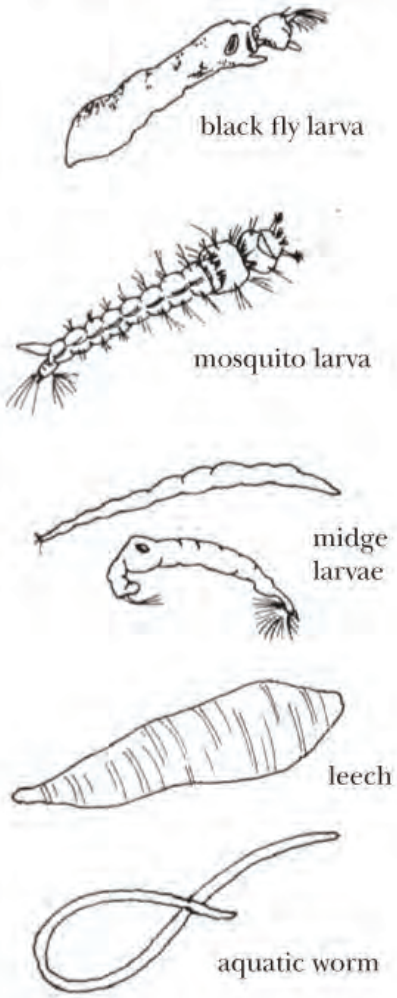
Good water quality



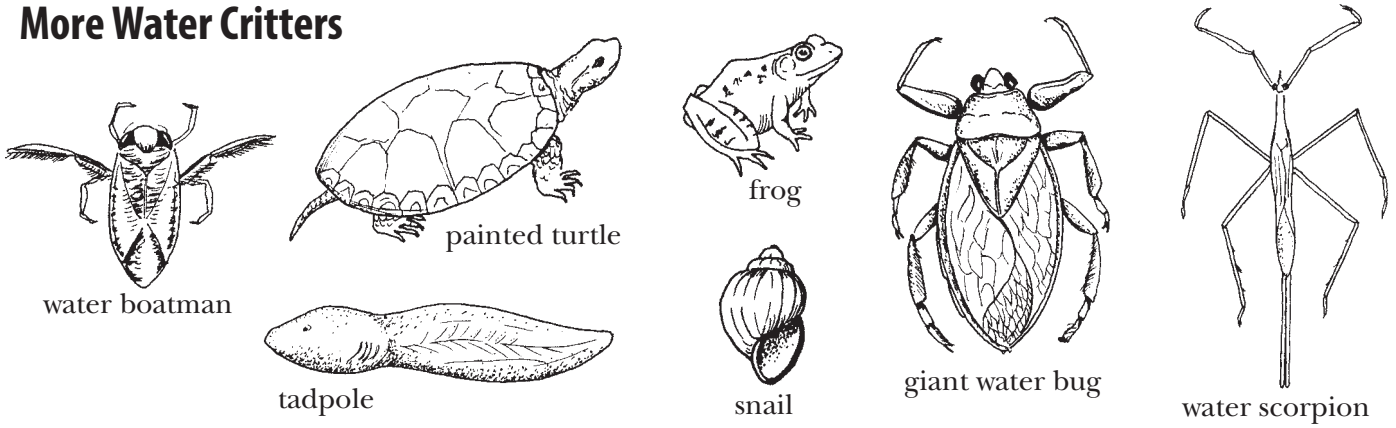
Range of water quality conditions



Poor water quality



More Water Critters



SOURCE: This Lake Alive! An Interdisciplinary Handbook for Teaching and Learning about the Lake Champlain Basin.

A Cow's Stomach

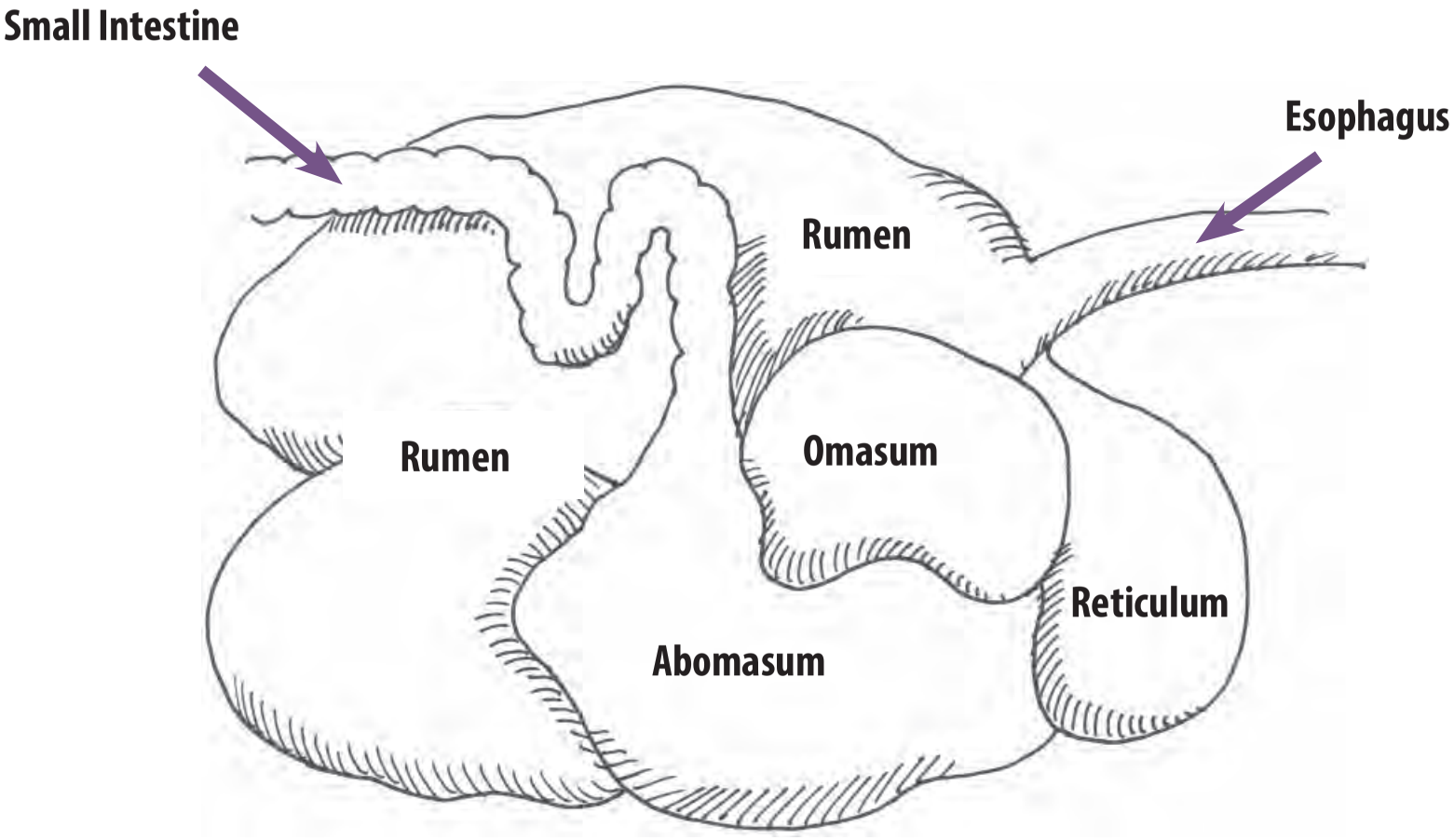
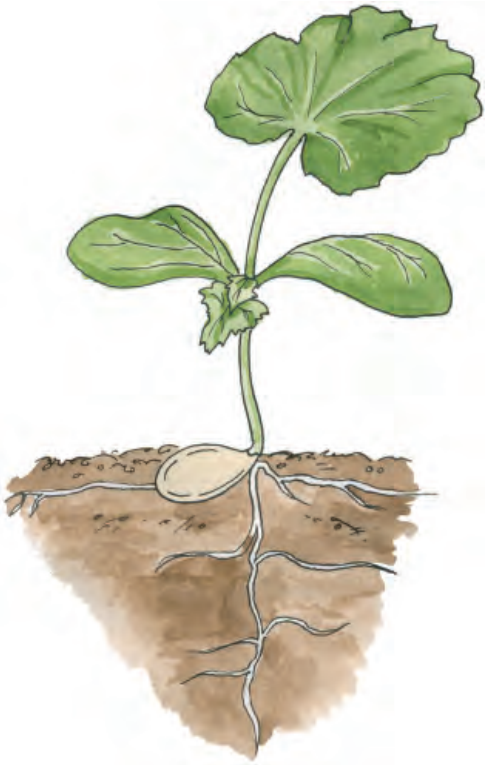


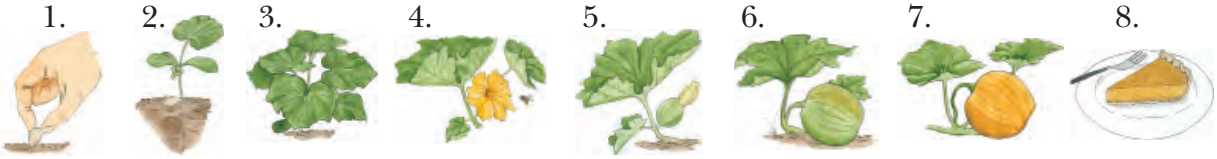
Illustration: Holly Brough

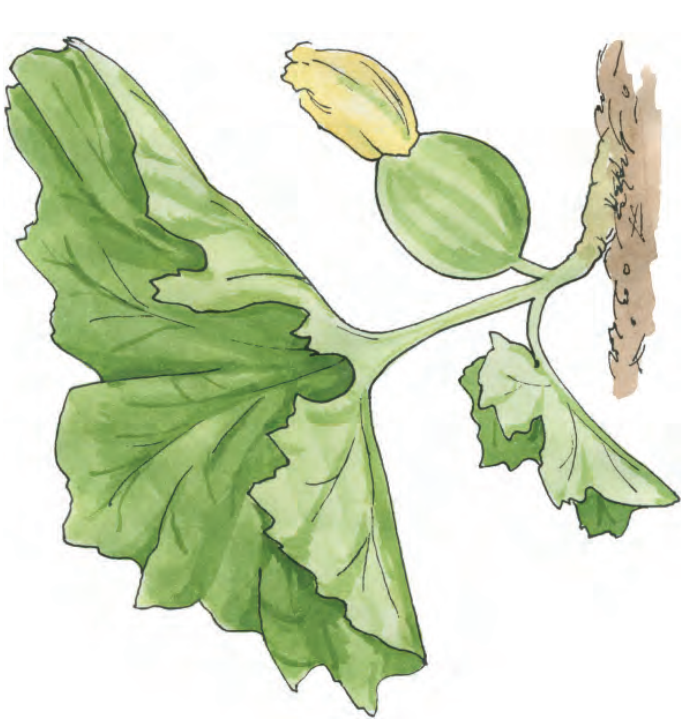
Pumpkin Life Cycle Cards

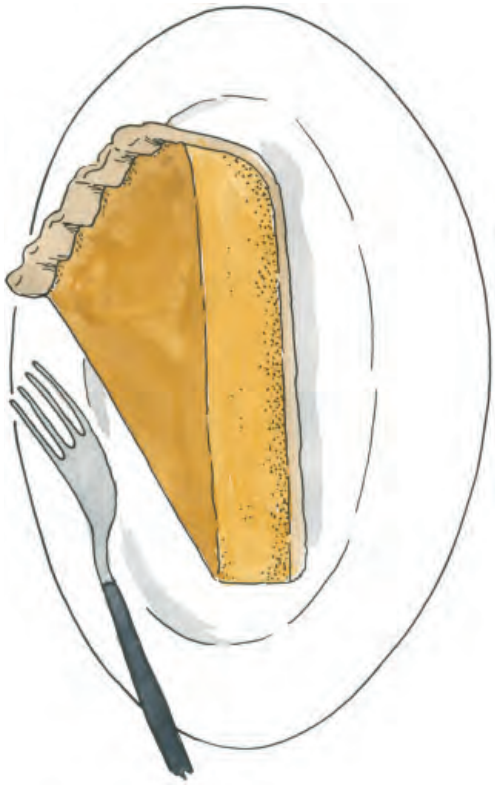


Illustrations: Holly Brough

Key:



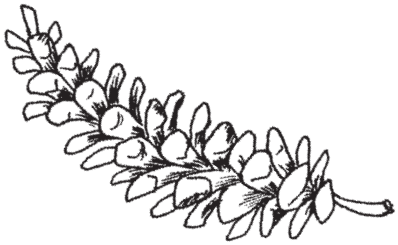
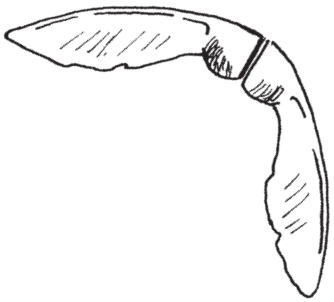
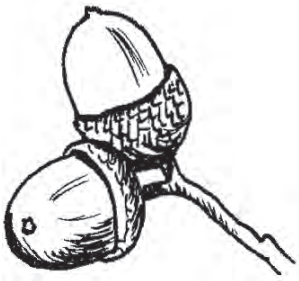
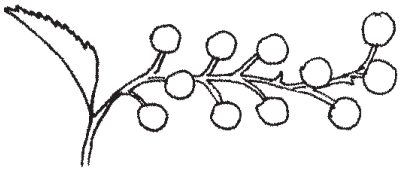




Illustrations: Holly Brough

Seed Scavenger Hunt

Find a seed that...

 ... is dispersed by wind.	 ... has been nibbled on by an animal.	 ... is protected by the scales of a cone.
 ... has three sides.	 ... is protected by spines.	 .... attaches to your clothes.
 ... has wings.	 ... has a cap.	 ... has a sticky coat.
 ... is round.	 is dispersed by water.	 ... is surrounded by a berry.

Illustrations: Holly Brough

K.I.M.'s (Keep In Mind) Game

This activity can be used as an introduction to a topic that has many pieces to it or as an assessment of children's understandings after an activity unit.

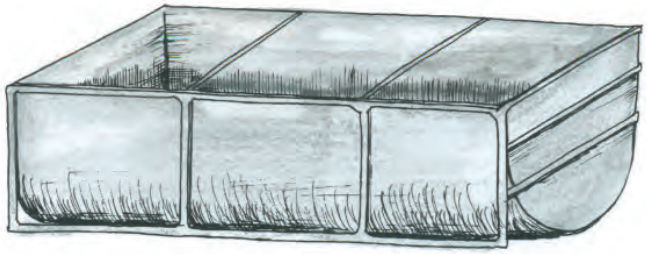
K.I.M.'s Game (Keep In Mind Game) is a takeoff on the memory game. If you have items that you want your students to become familiar with, KIM's game is a great activity. For example, if you're learning about gardening, you might have items used in planting a row of seeds;

- seeds
- string attached to two sticks to make a straight line in the garden
- a trowel or hoe
- watering can
- sign to indicate what is growing

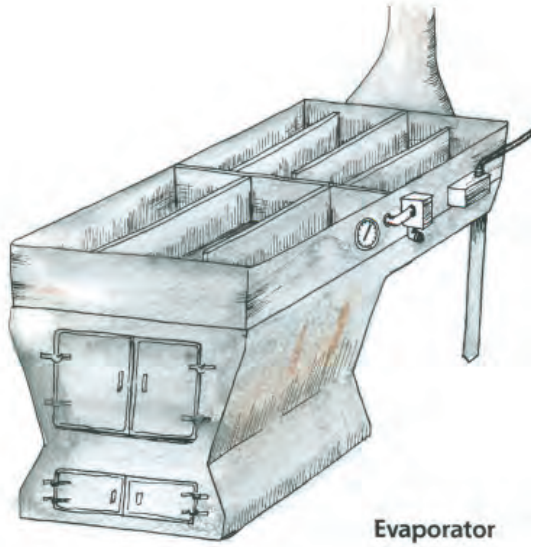
1. Lay the items out on the floor or table, cover with a cloth. The number of items should be appropriate for the age of the students. Explain that the cloth will be removed for a minute so children can see what is underneath and children should try to remember as many as possible before the cloth is placed over the items. Discuss strategies for remembering the items; knowing how many there are may help, make associations with the items, take a "picture" with your mind's eye.
2. Uncover the items and let the children observe them for a minute. The cover the items again.
3. Once the cloth is returned, begin listing the items as children take turns remembering them. After they have exhausted their memories, pull back the cloth and check the list with what is there. As you check items off the list, talk about what that item is and how it is used.

As an extension, after all the items have been discussed, have a child remove one item while the others close their eyes. At the count of three, eyes are opened and they try to guess what item has been removed.

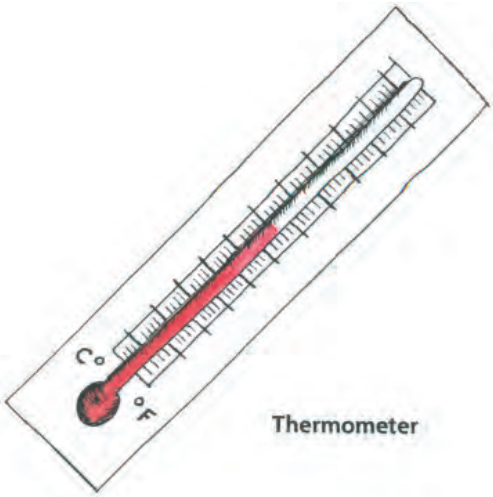
Sugaring Tools



Holding Tank



Evaporator



Thermometer

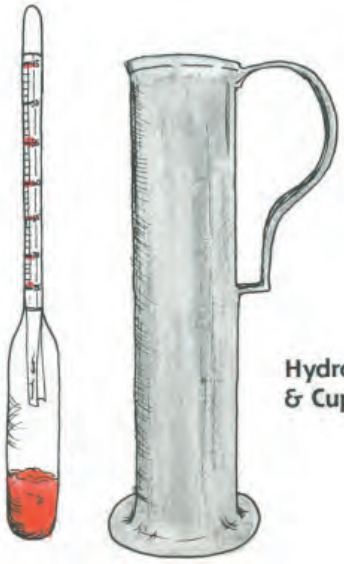
Wood

Ruler

Illustrations: Holly Brough

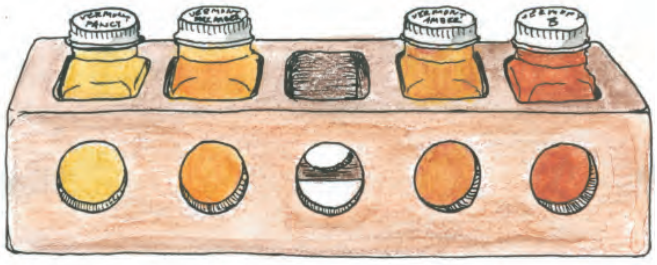
Scoop for Sheeting

Screen Scoop



Hydrometer & Cup

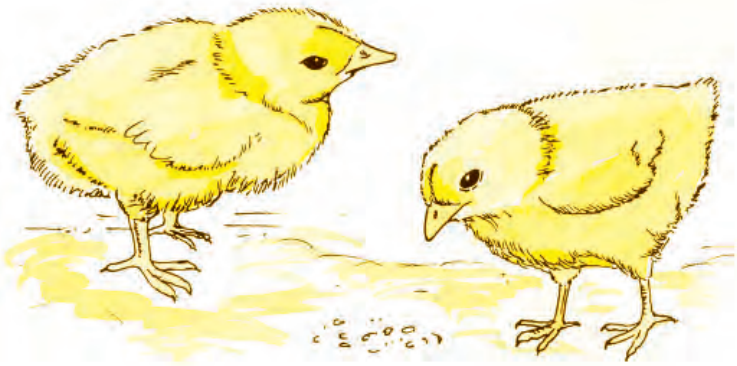
Gloves

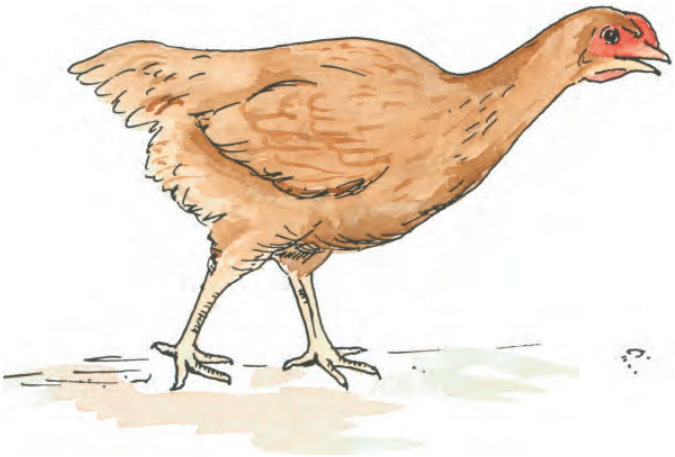


Grading Kit

Illustrations: Holly Brough

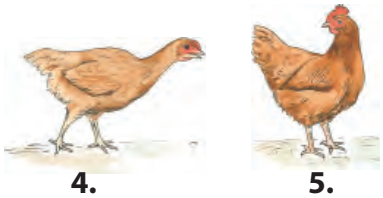
Chicken Life Cycle Cards





Key:

1. 2. 3.



4. 5.

Illustrations: Holly Brough

Worm Exploration Sheet

How many worms can you find?

Look closely to find the worm's mouth.

Can you find worm eggs?

What do worms eat? Find a piece of their food.

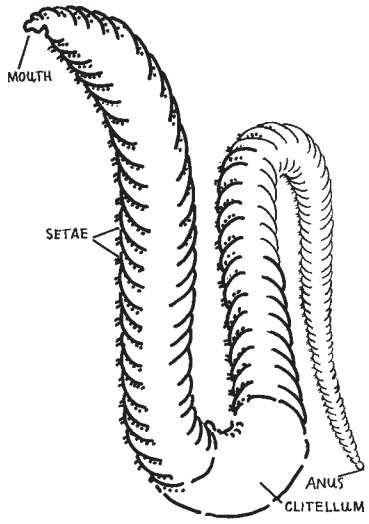
Can you see the food in their bodies?

Do worm like it wet or dry? Use the squirt bottle to find out.

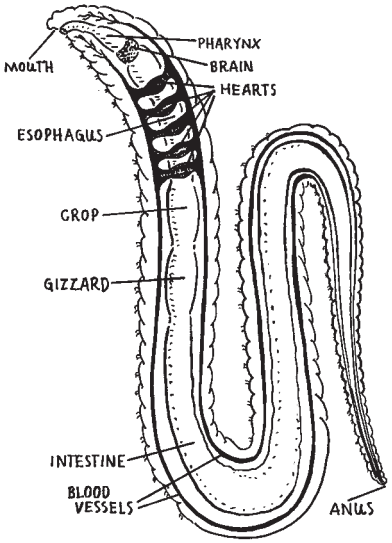
Do worms like it dark or light? Use the flashlight to find out.

Moisten your hand and hold a worm. How do they feel?

Find the different parts of the worm: the head, rear, brain, blood vessel, clitellum, mouth, and setae.



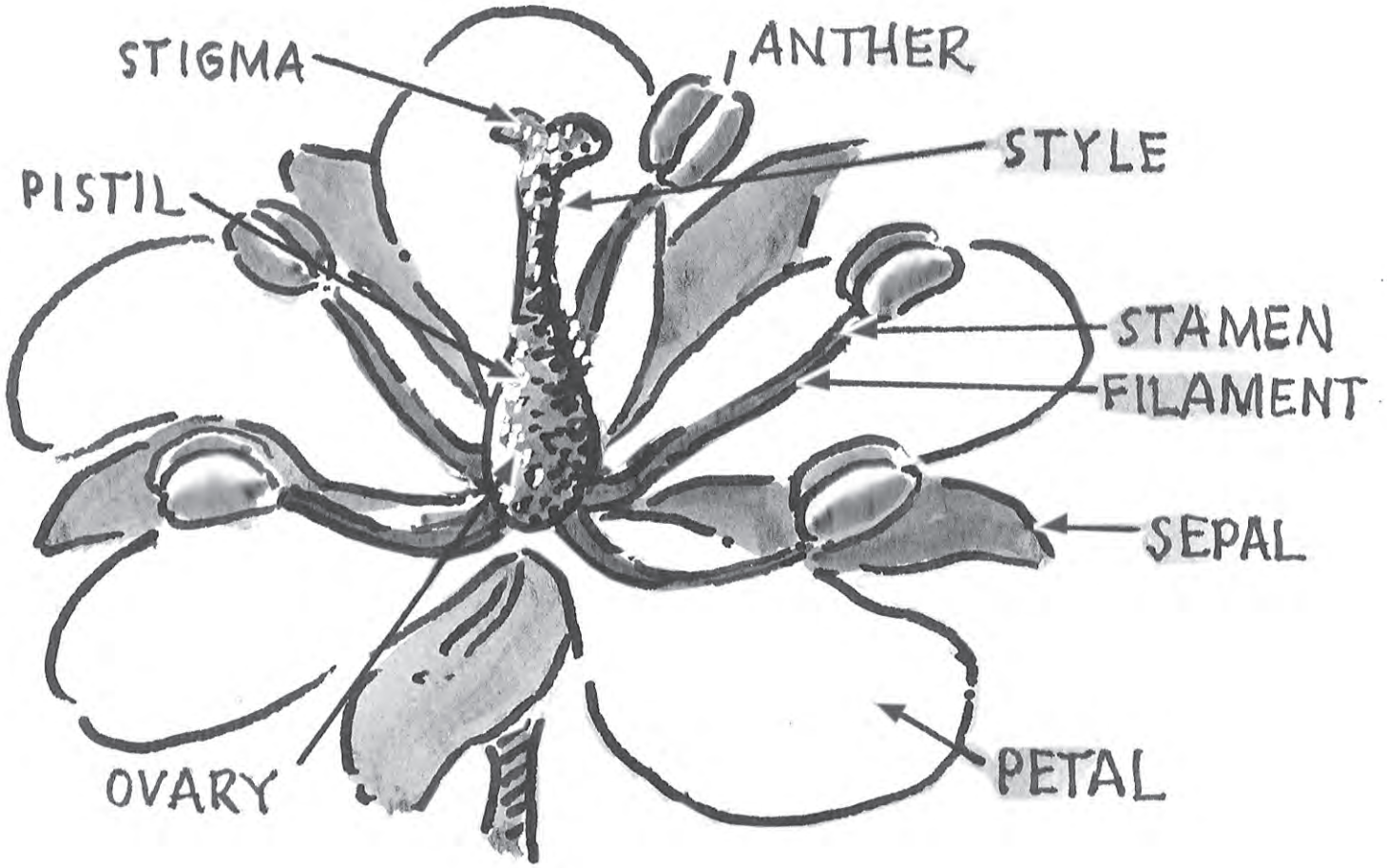
The Outside of a Worm



The Inside of a Worm

Illustrations: Project Seasons

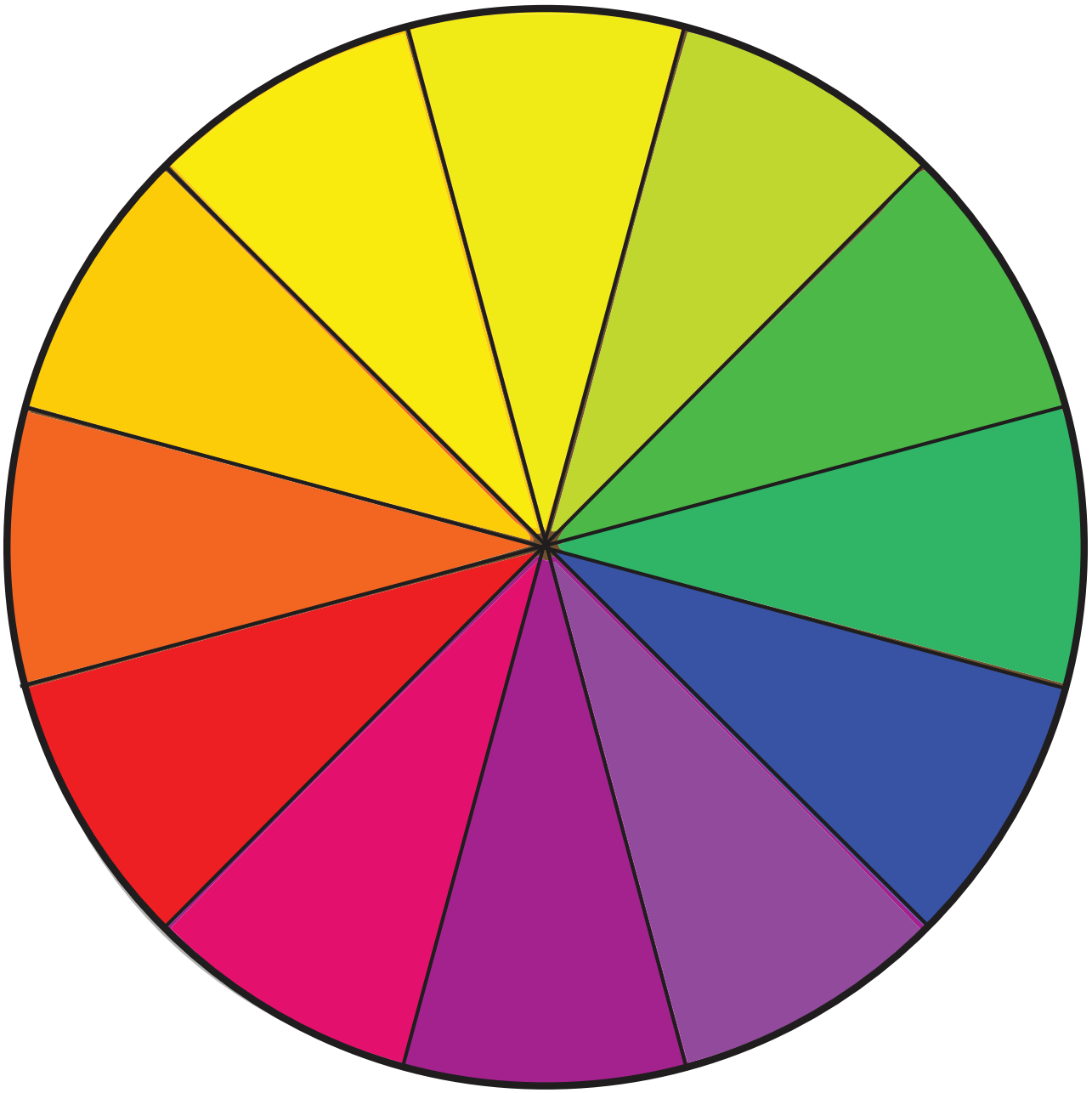
The Parts of a Flower



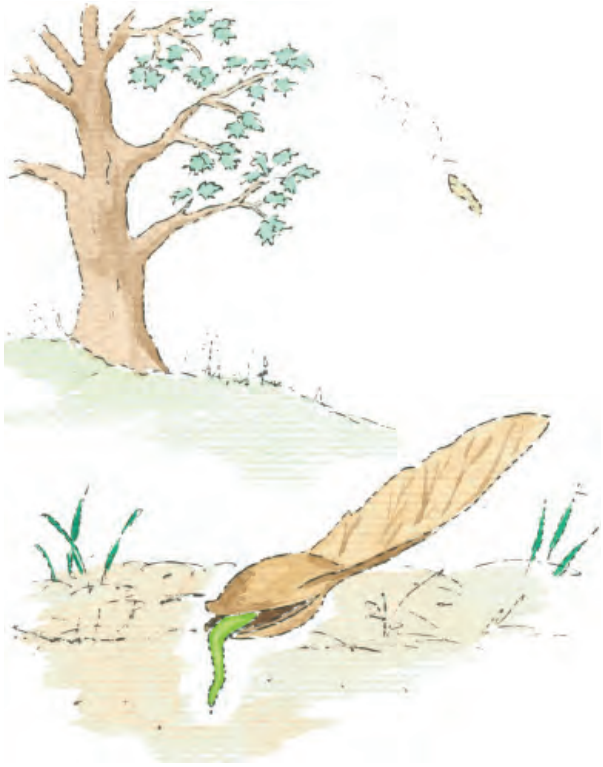
Source: Project Seasons

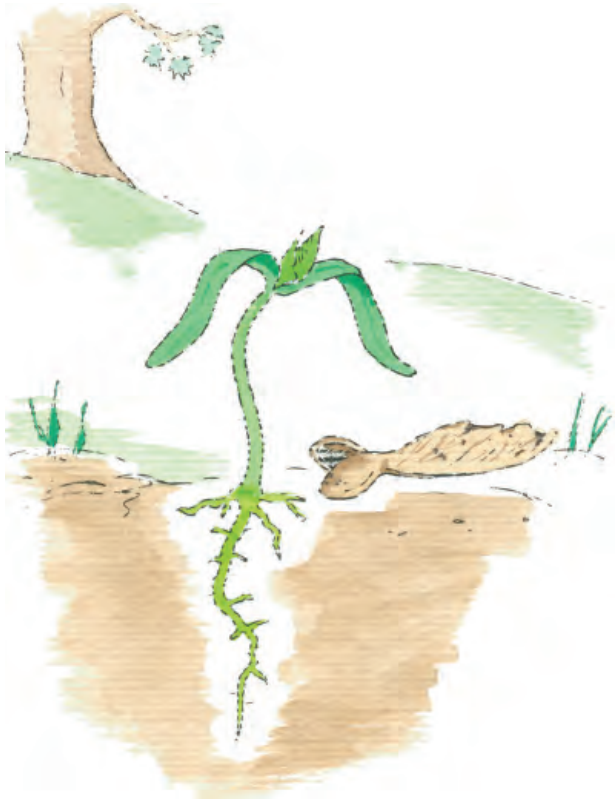
Color Wheel

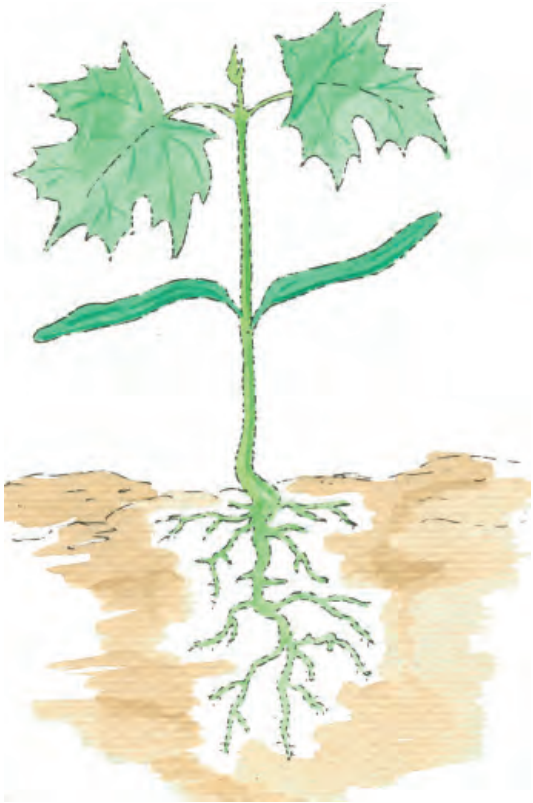
Find flowers that match the colors on the color whee.

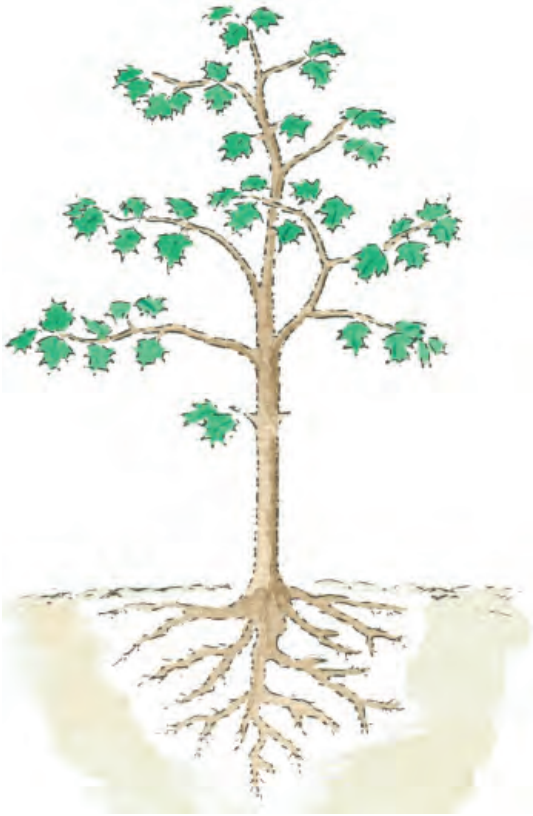


Tree Life Cycle Cards





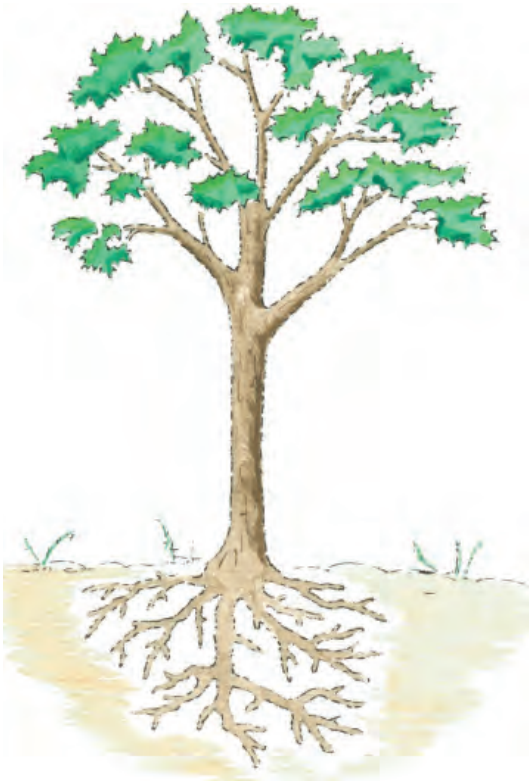


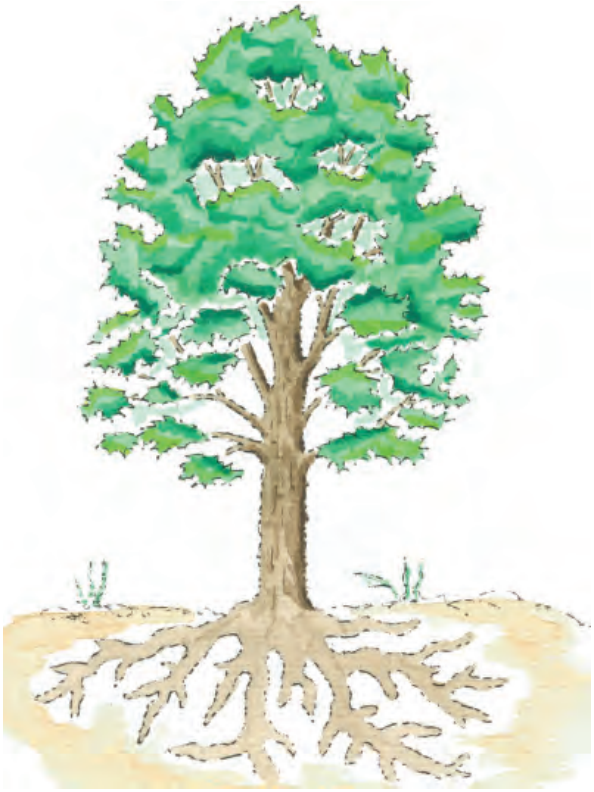


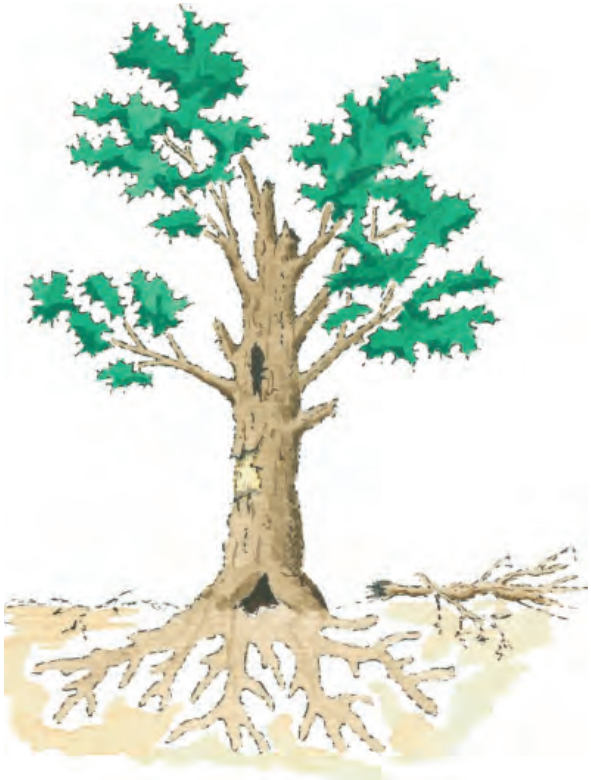
Illustrations: Holly Brough

Key:

1. 2. 3. 4. 5. 6. 7. 8.

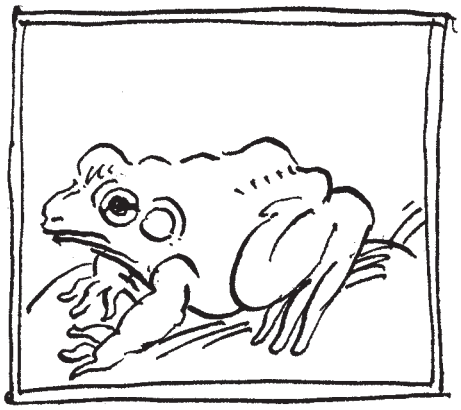




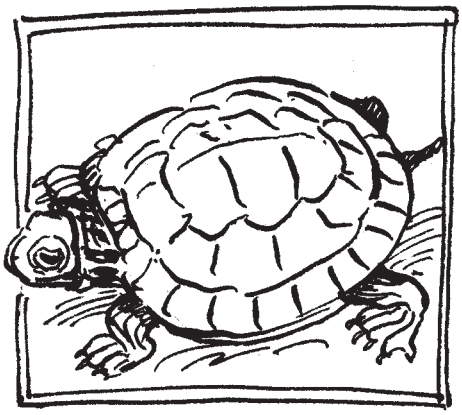


Illustrations: Holly Brough

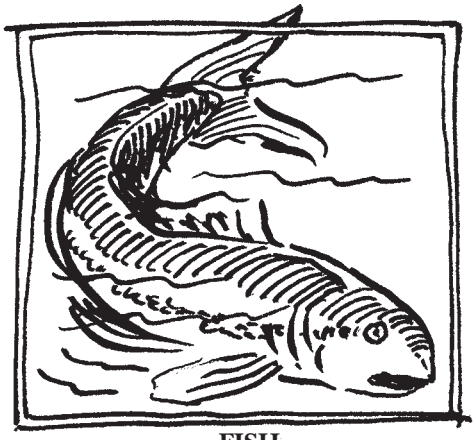
Adult Animal Cards



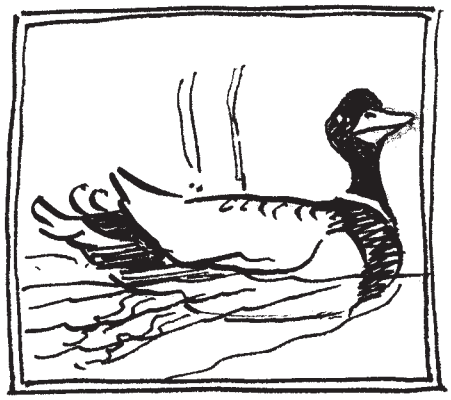
FROG



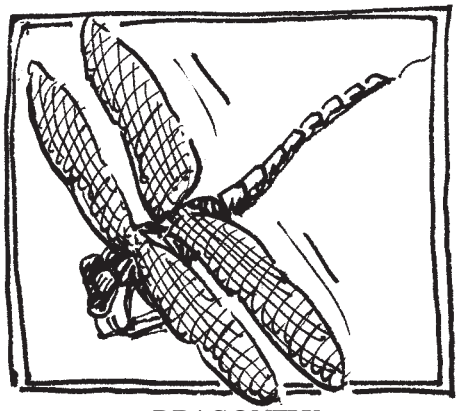
TURTLE



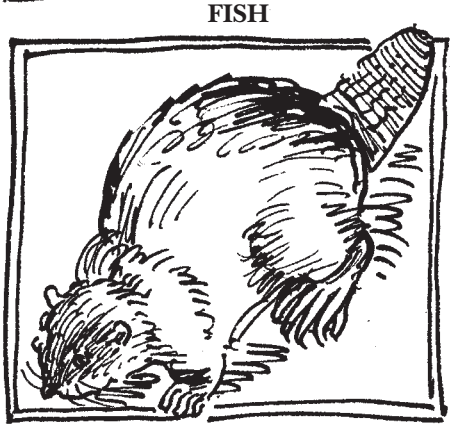
FISH



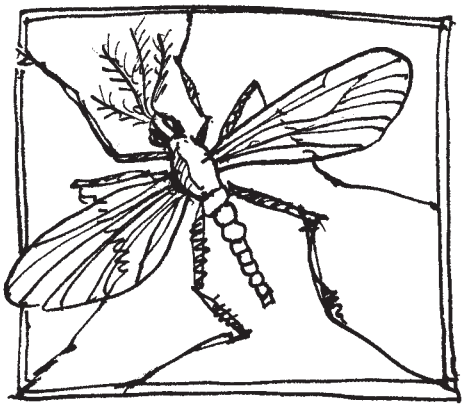
MALLARD DUCK



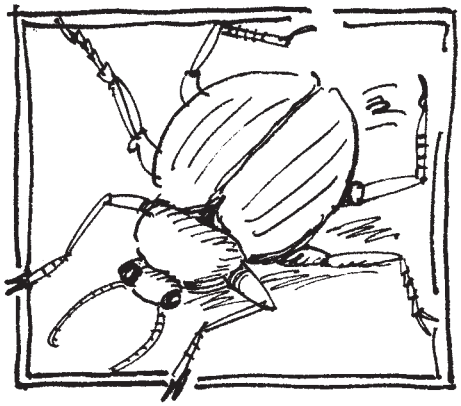
DRAGONFLY



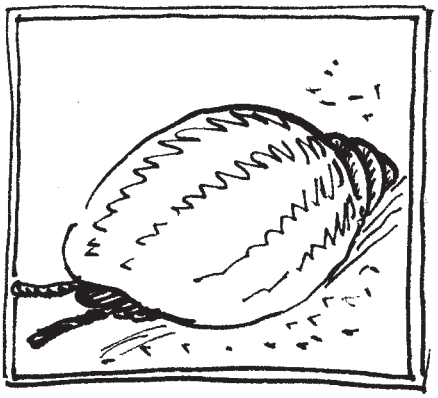
BEAVER



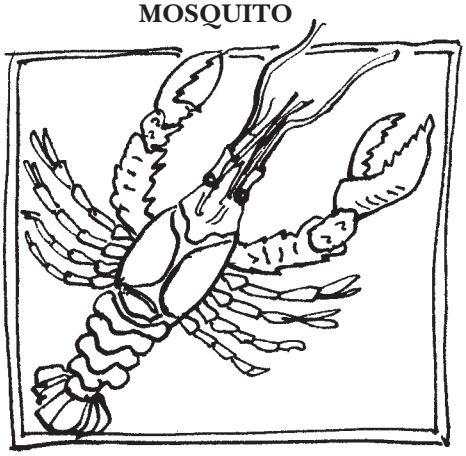
MOSQUITO



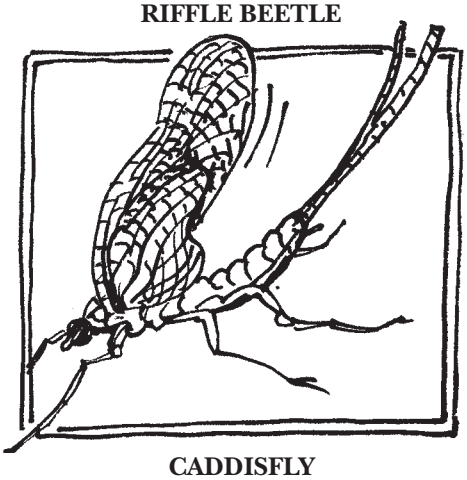
RIFFLE BEETLE



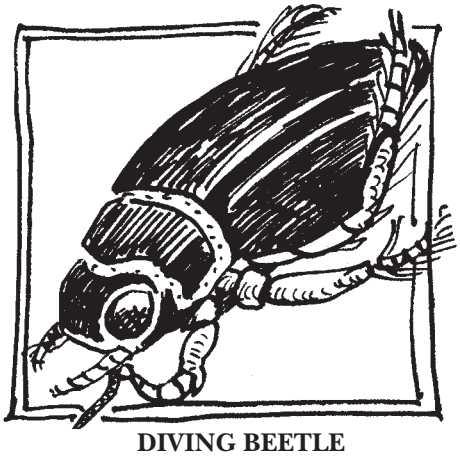
SNAIL



CRAYFISH



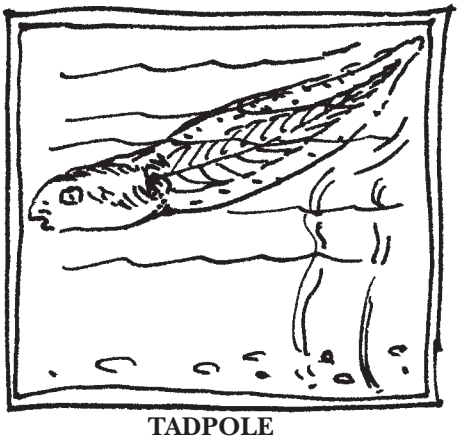
CADDISFLY



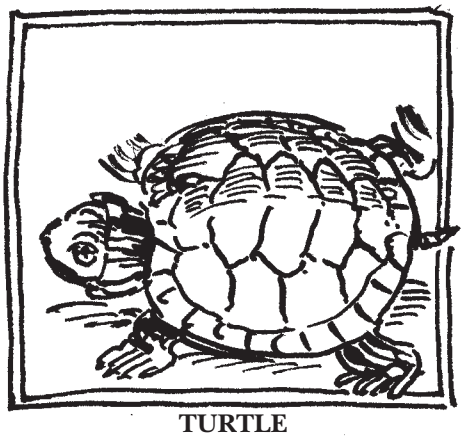
DIVING BEETLE

Source: PROJECT SEASONS

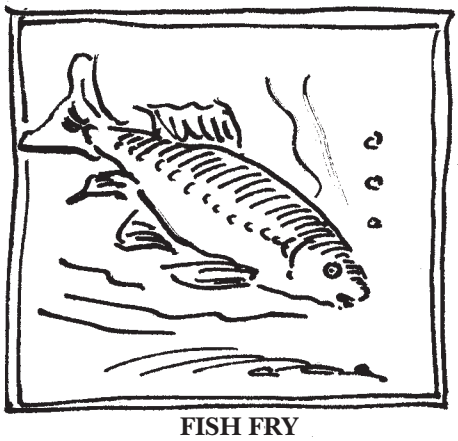
Baby Animal Cards



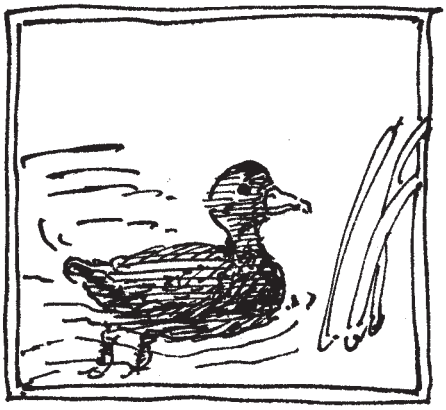
TADPOLE



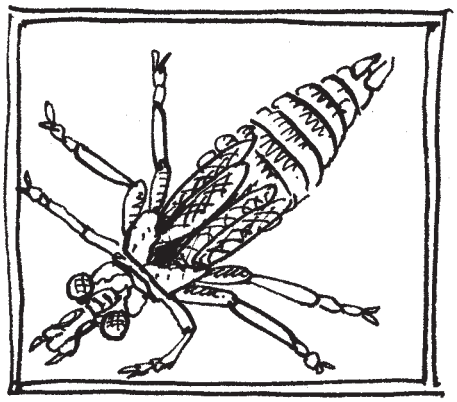
TURTLE



FISH FRY

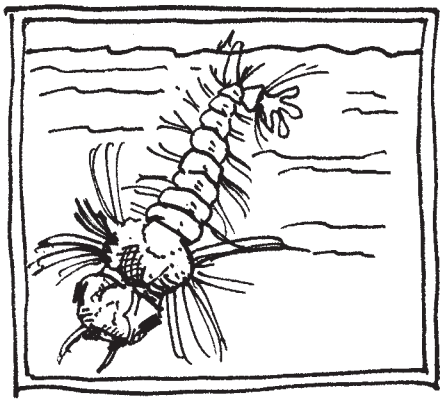


MALLARD DUCKLING

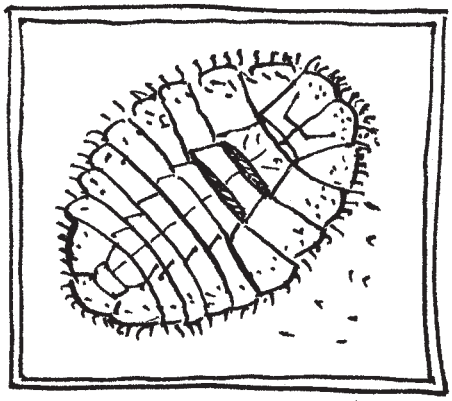


DRAGONFLY NYMPH

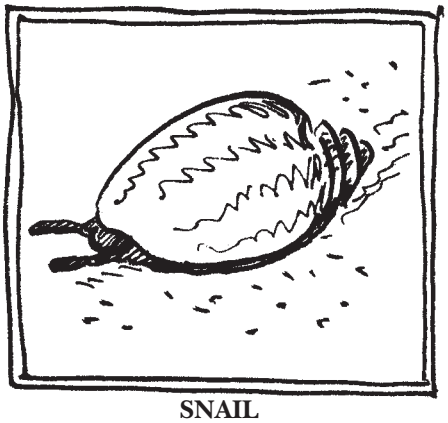
BEAVER KIT



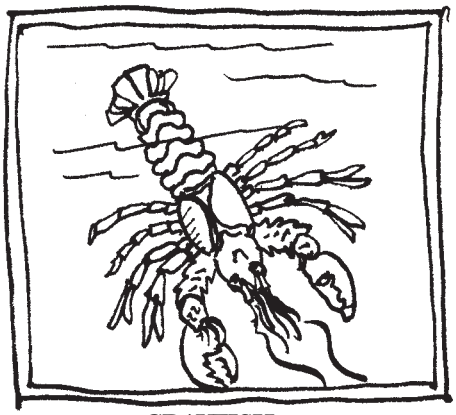
MOSQUITO LARVAE



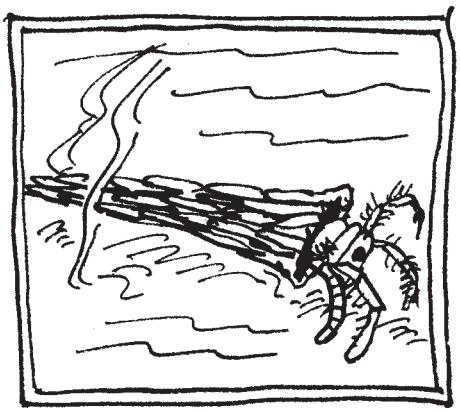
WATER PENNY



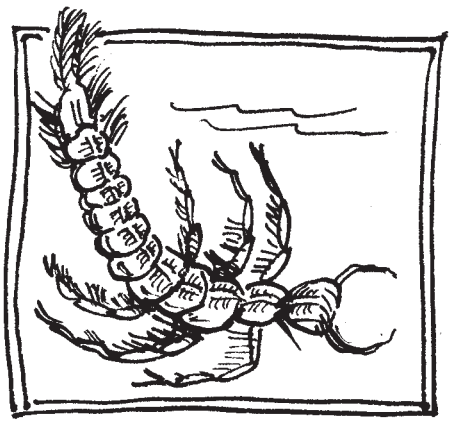
SNAIL



CRAYFISH



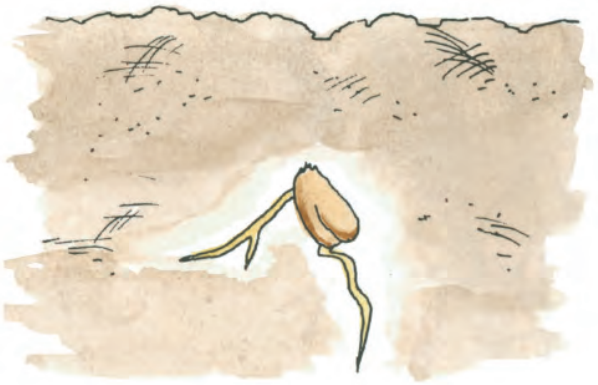
CADDISFLY LARVAE

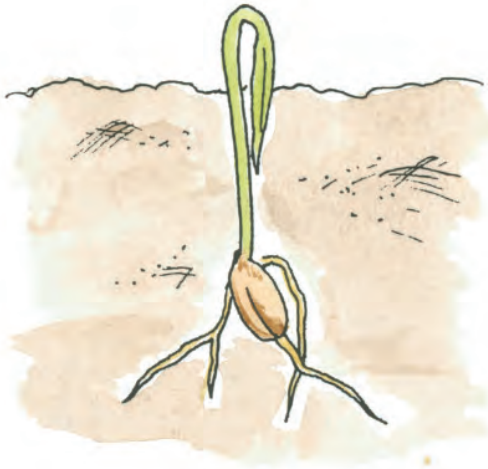


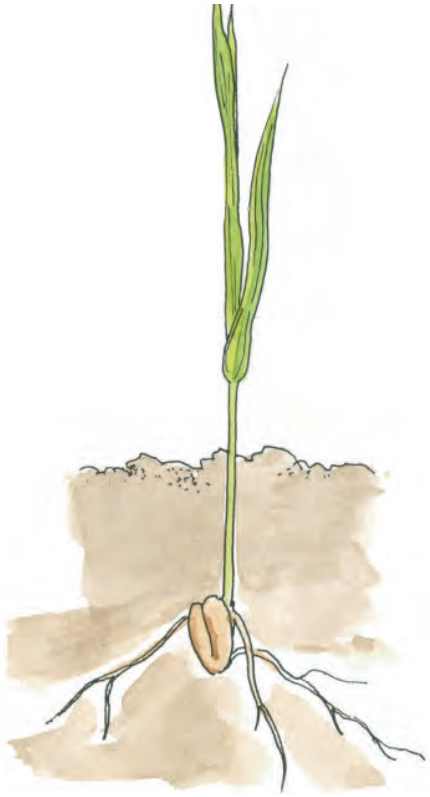
DIVING BEETLE LARVAE

Source: Project Seasons

Wheat Life Cycle Cards

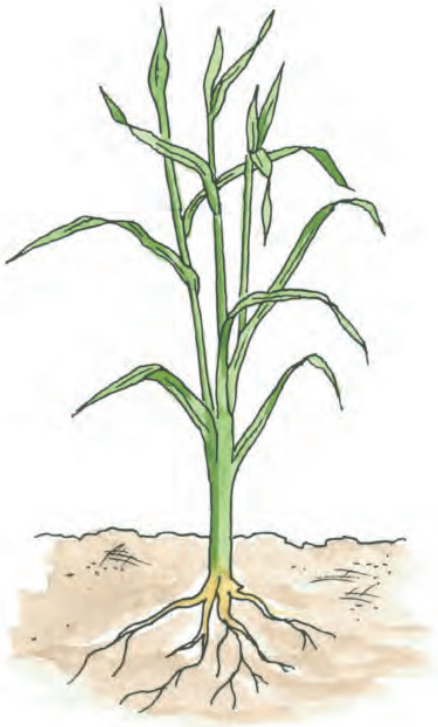






Illustrations: Holly Brough

Wheat Life Cycle Cards



Wheat Life Cycle KEY CARD


1


2


3


4

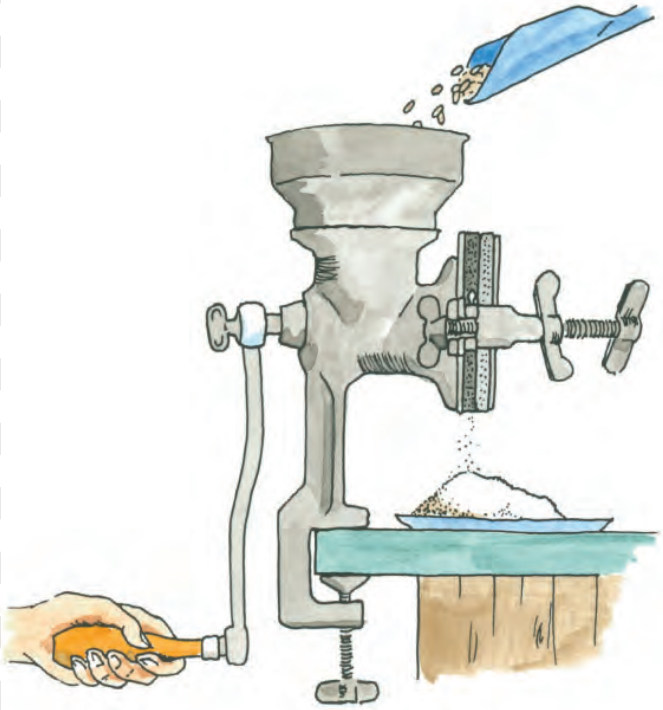

5


6


7

Illustrations: Holly Brough

Wheat to Bread Cards



Illustrations: Holly Brough

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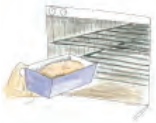
7. 
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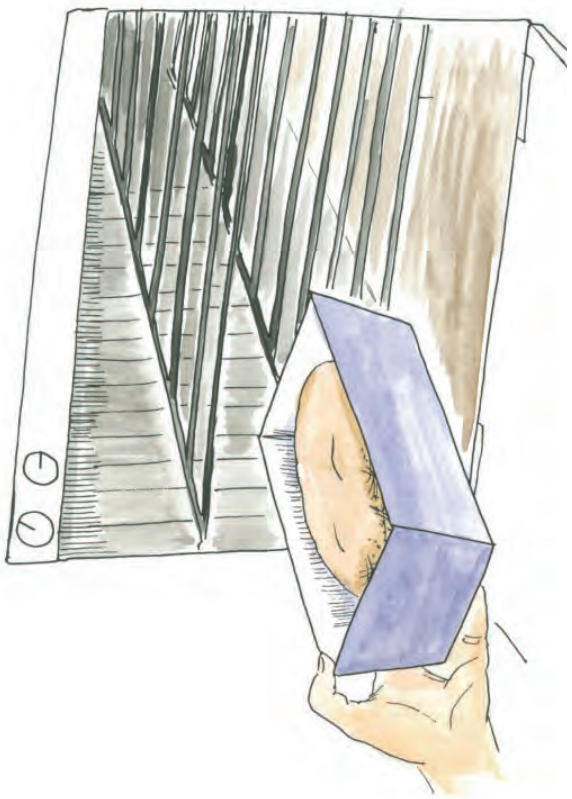
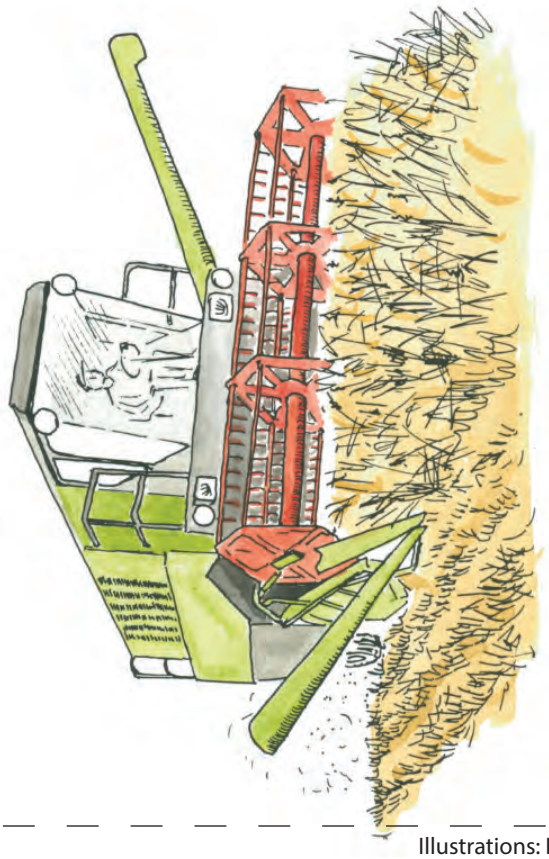




Illustrations: Holly Brough

Mix It Up: Make Potting Soil

Invite students to make potting soil by following a recipe. The recipe below can be blown up onto a poster for students to read together, or handed out like a recipe card, together with the explanations of what each ingredient contributes to the soil mix. You can find the ingredients for making potting soil at your local gardening center.

Blood meal: Rich in nitrogen
Bone meal: Rich in phosphorus
Egg shells: Rich in calcium
Wood ash: Adds potassium
Lime: An alkaline, it can help neutralize acidic soil
Perlite: A naturally occurring volcanic glass that pops like popcorn when heated. It improves aeration by keeping soil loose and preventing compaction.
Peat moss: holds water and air; contains few nutrients

Potting Soil Recipe

BASE FERTILIZER

¼ cup blood meal
¼ cup bone meal
¼ cup egg shells
½ cup wood ash

ADDITIONAL INGREDIENTS

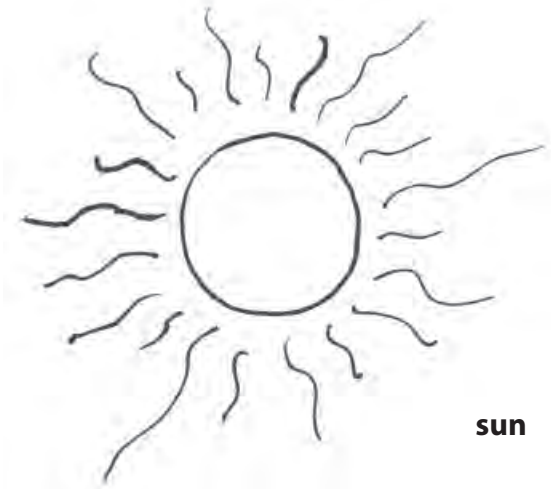
½ bucket peat moss *(5 gallon bucket)*
2 tbsp. lime
⅓ bucket perlite
1 ¼ c. Base Fertilizer *(see above)*
¼ bucket top soil
⅓ bucket compost

INSTRUCTIONS

1. First, mix together ingredients for Base Fertilizer.
2. Mix remaining ingredients together. *(To help students measure the correct amount of "bucket" ingredients, make lines for ¼'s and ⅓'s on the bucket)*
3. Add water until damp.

Use your potting mix to start seeds for your school garden or to take the plants home for the summer.

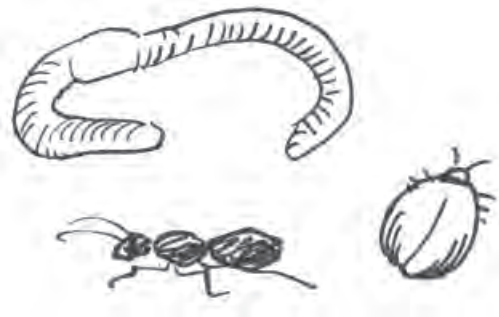
Soil Recipe Cards



sun

water

time



worms and insects

wind

bacteria

Illustrations: Holly Brough

Individual Voting Ballots for Taste Tests Parties

Cut out and give one ballot to each child

TASTE TEST Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 	**TASTE TEST** Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 	**TASTE TEST** Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 
TASTE TEST Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 	**TASTE TEST** Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 	**TASTE TEST** Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 
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TASTE TEST Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 	**TASTE TEST** Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 	**TASTE TEST** Product _____ Date_____ (circle one): **Like! Sort of... Don't Like** 

adapted from Kathy Alexander, Ferrisburgh Central School, Ferrisburgh, VT, 2009

Source: VT-FEED, A Guide to Taste Testing Local Food in Schools, 2010

Life under a Log: Critter ID

Worm

Harvestman
(Daddy Long Legs)
This Arachnid is NOT a spider!

Millipede

Size- [_____]

Centipede

Size- [_____]

Red Backed Salamander

Sow Bug (Wood Louse)

Size- [____]

Carpenter Ant

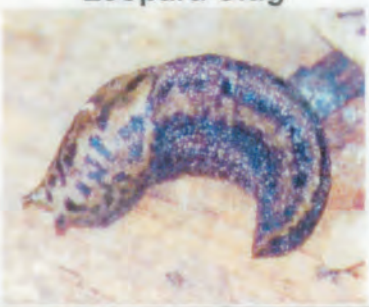
Size- [____]

Turkey Tail

Mycelium

Red Eft

Leopard Slug



Ground Beetle

Size- [_____]

Garter Snake

American Toad

Subterranean Termite

Size- [____]

Life under a Log: Critter ID

American Toad: These toads can live all over the United States. They can live up to 10 years in the wild, and they shed their skin every few weeks while they are still growing. They eat insects and lay their eggs in fresh water.

Carpenter Ant: These ants are ¼ to ¾ inch in length and black (sometimes red) in color. They naturally live in dead logs and eat insects, honeydew from aphids and plant juices.

Centipede: These arthropods are reddish-brown in color and are generally about one inch in length. They feed on live insects and do not damage plants.

Garter Snake: These small common snakes live in a variety of habitats and prey primarily on worms and amphibians.

Ground Beetle: There are many different species of ground beetles that differ slightly in appearance, although most are black. They are most active at night and they eat insects, which makes them beneficial to agriculture.

Harvestman: Often call Daddy Long Legs; harvestmen are neither spiders nor insects. Over 6,400 different species have been discovered world wide. They are omnivorous, eating small insects as well as decaying plant and fungal matter.

Leopard Slug: These slugs eat plants, the remains of dead animals, fungus, and other slugs. They are mostly nocturnal and like damp shady places. They have four antennae on their head: two long and two short.

Millipede: Common species of millipedes have between 80 and 400 legs. They are powerful burrowers and eat plant material.

Mycelium (mi se'le em): This branching structure is the underground part of a fungus. The mushrooms that we see above ground are the fruiting bodies of these underground organisms.

Red Backed Salamander: These salamanders live their whole lives in forests throughout eastern North America. They require a moist environment since they breathe partly through their skin. They eat insects, bugs, and spiders and they lay their eggs in freshwater ponds close to or in the forest.

Red Eft: This is the middle life stage of the Eastern Spotted Newt. Its larval (newborn) stage is aquatic (lives in fresh water), until it emerges and lives in a forest for 1-3 years as a red eft. Then the newt changes again into their aquatic adult stage. They eat insects, mollusks and crustaceans, and even young amphibians and frog eggs.

Sow Bug: This isopod is a scavenger and feeds on dead and decaying plants and animals. They breathe with gills and therefore need to live in a wet environment.

Subterranean Termite: These white soft-bodied termites are the workers in a termite colony. They are responsible for caring for eggs, constructing tunnels, foraging for food, and feeding and grooming other colony members. They eat cellulose, which is found in wood.

Turkey Tail: This is one of the most common types of bracket fungi that are found in the forest. They are important decomposers of wood, helping to recycle the nutrients in the wood back in to the soil.

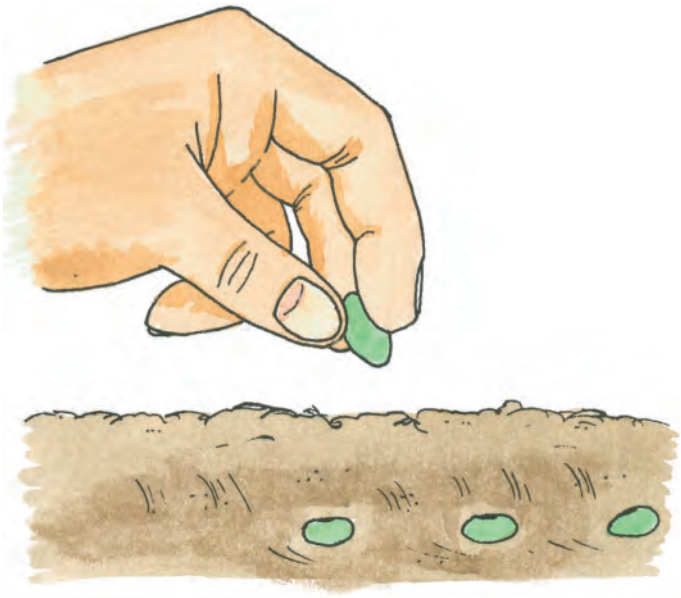
Worm: There are over 4000 species of worms worldwide. They help to aerate the soil and return essential nutrients from rotting plant material back to the soil.

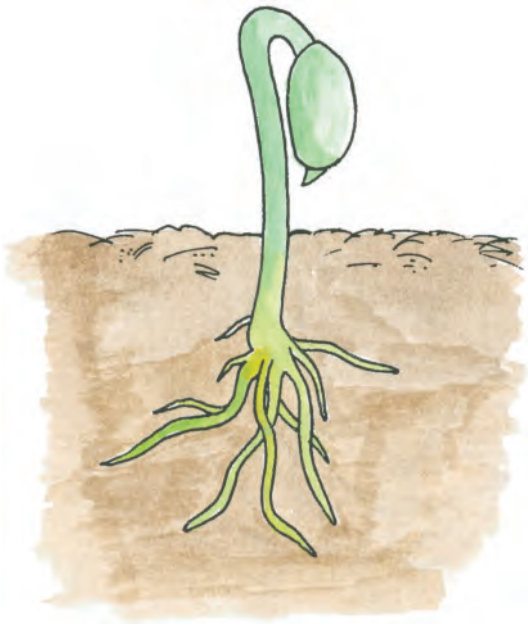
Tips for Cooking with Kids

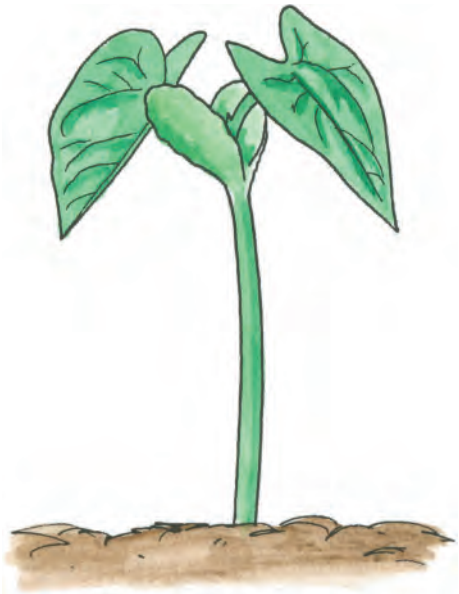
Adapted from VT-FEED Food, Farm & Nutrition Curriculum Units.

- Be sure to wash hands with soap and water before touching food. Tie long hair back and push up long sleeves before washing hands.
- Remind children that if they have to cough and/or sneeze, they should turn their bodies away from the cooking area and sneeze or cough into their upper arm sleeve Fingers need to stay out of eyes and noses. Repeat washing of hands if this happens If children cook on a regular basis this will eventually become second nature. Be patient but vigilant.
- Gloves can be used if the products will be served raw. If the products will be cooked, gloves are not required.
- Start with a clean cooking area.
- Be careful with cutting implements such as knives and food graters. Teach the correct protocol with sharp tools. For example, knives are never passed but rather laid down on the counter to be picked up by the user. Get child-sized appropriate tools. Have enough adult supervision when young children are using knives.
- Do only one job at a time and avoid multiple distractions. Try to provide a calm and focused environment so that the students can engage in the task at hand.
- Work in small groups with an adult for each small group.
- Play it safe. When it comes to buying, preparing ,cooking and storing food, check the expiration dates, wash the produce well, cook food thoroughly and store foods properly so they don't spoil.
- Clean up with everyone's help.
- Have fun! What a gift you have given to children to allow them to prepare their food. They are more likely to try new foods that they have prepared.

Bean Life Cycle Cards







Illustrations: Holly Brough

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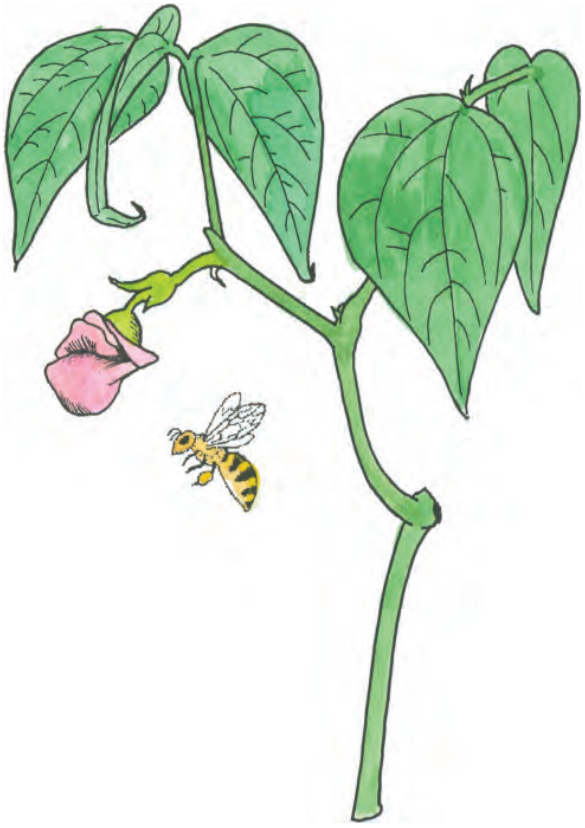

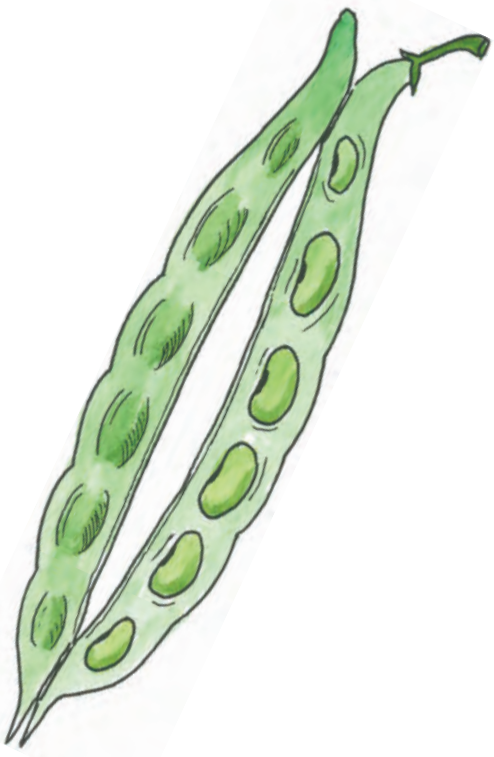


noor