

MESS® Recommended Materials



Basic equipment

- handheld magnifying lenses
- tabletop magnifiers
- plastic Petri dishes, test tubes, or other small transparent containers with covers
- camera
- printer for photos
- large chart paper
- markers, crayons, and pencils
- sunny window or other appropriate light source

Live plants

- several flowering and non-flowering plants for comparison
- one or more plants with clear root systems
- at least two plants of the same size and type for experiments on the effects of light
- at least one plant to investigate plants' need for water
- trees

Seeds

- variety of seeds such as acorns, sunflower seeds, and seeds from edible fruits
- small items that resemble seeds (e.g., plastic and wooden beads, stones)

Plant Life

- bean seeds for sprouting (e.g., lima beans)
- a variety of quick-sprouting seeds such as grass, beans, and radish

Leaves and flowers

- assortment of leaves to explore
- assortment of cut flowers to investigate

Food items

- assortment of fruits that vary in the number, size, color, and placement of seeds such as red, yellow, and green bell peppers, papaya, mango, avocado, and banana
- sweet potato
- large onion
- celery stalks with leaves

Photos, illustrations, posters, and models

- photos or pictures of a variety of plants such as grasses, trees, and flowers
- photos or pictures of living and non-living things that are not plants
- simple illustration, poster or model of the basic parts of a plant
- simple illustration, poster, or model showing the life cycle of a plant
- series of 4-5 photos illustrating the process of a farm product becoming a table-ready food such as grain to bread; orange to juice; and tomatoes to sauce
- photos or illustrations of trees or plants used to make common products such as cotton and agave plants, rubber, willow, pine and cork trees

Supplies

- toothpicks
- clear plastic cups or sealable bags
- paper towels
- spray water bottle
- food coloring
- potting soil

Additional Materials

- plastic watering cans
- plastic shovels or trowels
- child-sized gardening gloves
- leaf stamps
- ink pads or paint
- paper
- tree rounds
- assortment of plant products such as rubber eraser, sisal rope, cork, cotton cloth, willow basket, organic soap, pine toy car or boat

Books

Aston, Dianna Hutts. *A Seed Is Sleepy*. San Francisco, CA: Chronicle Books, 2007. A single sentence (per double-page spread) in large cursive writing assigns a rather human characteristic to seeds and, in the process, introduces wonderful vocabulary (adventurous, clever, naked). The balance of each spread contains beautiful detailed illustrations of a seed or seeds that show that attribute. Smaller type provides more scientific text. The variety and wonder of so many seeds is fascinating (even the endpapers are packed and labeled).

Berger, Melvin. *The Vegetable Garden*. Northborough, MA: Newbridge Educational Publishing, 2007. “Do you know how to plant a vegetable garden?” Thus begins a simple, step-by-step text and photograph lesson on vegetable gardening. Photos of below-ground root growth are particularly useful. Questions for further discussion and some fun facts are listed at the end.

Blackstone, Stella, and Nan Brooks. *Making Minestrone*. New York: Barefoot Books, 2000. Young friends gather to make soup, but their mission starts in the garden where most of the soup ingredients can be found. A simple rhyming text and colorful illustrations packed with details describe the soup-making process. Vegetables are generally familiar ones. Plenty of cleaning, slicing, and frying (though no measuring) goes on at the gathering. A recipe that serves four is provided.

Brown, Peter. *The Curious Garden*. New York: Little, Brown and Company, 2009. While exploring his desolate city one day, a little boy named Liam discovers some struggling flowers. He decides to care for them. With his watering and pruning and some help from the sun, the garden gradually transforms the dark, gray city into a lush, green world. The captivating illustrations remind us that nature can be found in the most surprising places. The authors attribute human motives to the garden in a few places, and the message that a single person can make a difference may need to be tempered with words of caution for young listeners.

Brown, Ruth. *Ten Seeds/Diez semillas*. New York: Alfred A. Knopf, 2001. A counting book with minimal text and richly detailed illustrations demonstrates what happens when ten sunflower seeds encounter a variety of animals (including people). Under sometimes stressful conditions, the plant life cycle continues. The coated paper and simple format make this a particularly useful book for the youngest “readers.”

Bunting, Eve. *Flower Garden*. San Diego, CA: Harcourt Brace, 1994. Beautiful, richly colored oil paintings show a little girl and her father buying the “ingredients” for a window box flower garden. A simple rhyming text adds the explanation that this activity is mom’s birthday surprise. The city street scenes also provide detail for conversation.

Plant Life

Cherry, Lynne. *How Groundhog's Garden Grew*. New York: Blue Sky Press, 2003. In this richly illustrated book, Squirrel teaches Groundhog everything Groundhog needs to know to grow many different vegetables in his own big garden. They collect seeds, wait for appropriate weather, till the soil, plant seeds (and sprouted potatoes and seedlings), label rows, care for the growing plants, harvest the crops, and share the bounty. Text is ample but packed with information. Illustrations—including endpapers—are richly detailed.

Cole, Henry. *I Took a Walk*. New York: Greenwillow Books, 1998. People see many things, but do we really observe closely? This book encourages observation by asking readers to find specific things in the woods, meadow, stream, and pond. While many of the specifics are animals, it is the lush plant scenes that first catch your eye and can be the topic of fruitful conversation—without ever opening the foldout pages that reveal more animals. For those who want specifics, a key in the back identifies their exact location in each scene.

Cole, Henry. *Jack's Garden*. New York: Mulberry Books, 1995. With beautifully detailed illustrations, this story tells what happens in Jack's flower garden. All the plants may not be familiar to young gardeners, but the planting process is the same. A minimal but cumulative text and border illustrations with appropriate labels stimulate conversation as the garden develops. A concluding page gives advice for starting your own flower garden.

Denega, Danielle. *In the Garden*. New York: Scholastic, 2001. Readers are invited to visit this garden where vegetables, fruits, herbs, and flowers all grow. Sections highlight where different kinds of vegetables are grown, with a small fold-out edge providing additional information about specific plants—and sometimes an animal found there. Words like “gourd” are introduced in context, but text is generally sparse. At the end are an overhead map of the garden and a key to the names of all the plants and animals, with encouragement to find them on the previous pages.

DePalma, Mary Newell. *A Grand Old Tree*. New York: Arthur A. Levine Books, 2005. This tree's life cycle includes flowers, fruit, seeds, leaves, visitors, weather, and dying, all over time. Text is simple and straightforward. Illustrations are cheerful watercolors filled with enough detail to encourage continuing observations. Together they generate conversation about what makes the tree “grand.”

Eclare, Melanie. *A Harvest of Color*. Brooklyn, NY: Ragged Bears, 2002. Beautiful color photographs and more-than-enough text tell the story of several young friends as they plant and tend a vegetable garden. Text provides the story on several levels and can be edited easily. The children eventually celebrate their success at the end of the summer by fixing a salad (recipe included) from their own vegetables.

Plant Life

Ehlert, Lois. *Eating the Alphabet*. Orlando, FL: Voyager Books, 1988. This colorful book is an alphabetical tour of the world of fruits and vegetables, from apricots and artichokes to yams and zucchini. Text is limited to upper- and lower-case letters and labels for each of the plant parts illustrated. A glossary provides pronunciations and a few details about each fruit/vegetable.

Ehlert, Lois. *Growing Vegetable Soup*. New York: Harcourt Children's Books, 2004. "Dad says we are going to grow vegetable soup." What follows are boldly-colored, cut-paper illustrations and minimal text that show how to grow vegetables to make "the best soup ever." Equipment and vegetables are all labeled, showing another use of print.

Ehlert, Lois. *Leaf Man*. New York: Harcourt, 2005. A man made of leaves blows away, traveling wherever the wind takes him. Great illustrations creatively use a variety of leaves and encourage readers to use their imaginations. Sharp eyes will find fun surprises among the leaves. Endpapers provide identification of the various leaves in the story. ALA Notable Book

Ehlert, Lois. *Pie in the Sky*. Orlando, CA: Harcourt, 2004. "I've never seen pies growing on trees. Wouldn't that be something?" A conversation could begin here, and continue throughout the story as subtext on each page details everything you can see—except a pie. Colorful collages support the growing knowledge that this is a story about a cherry tree and eventually a cherry pie. Except for a piecrust recipe, all the details, including measurements, are ready for a hands-on project to follow the reading.

Ehlert, Lois. *Planting a Rainbow*. San Diego, CL: Harcourt Brace, 1988. Bold illustrations and simple sentences describe the yearly cycle and process of planning, planting, and picking flowers in a garden. Labels throughout show another use of print.

Ehlert, Lois. *Red Leaf, Yellow Leaf*. San Diego, CA: Harcourt Brace, 1991. Through the eyes of a child and using beautiful, informative collage illustrations, the life story of the tree growing in the yard is told. A plant's life cycle and seasonal changes are highlighted. Identification labels throughout introduce vocabulary. 1992 NSTA Outstanding Science Trade Book for Children

Finch, Mary. *The Little Red Hen and the Ear of Wheat/La gallinita roja y la espiga trigo*. Brooklyn, NY: Barefoot Books, 1999. In bold colors and simple text, a little red hen finds a grain of wheat. She then plants, waters, harvests, mills, and bakes it into a tasty loaf of bread—all without the aid of her house-mates the rooster and mouse. They are, however, quite willing to help her eat it.

Plant Life

Freeman, Marcia S. *Is It Alive?* Northborough, MA: Newbridge, 2002. “How can you tell what is alive?” From this initial inquiry, living things are described as things that grow, reproduce, need food and water, excrete waste, and move. Good examples compare living and nonliving things, and introduce the idea that some things once lived but now are nonliving. Microscopic cells are suggested as the ultimate standard of “living.”

French, Vivian. *Oliver’s Vegetables*. New York: Orchard Books, 2005. “I don’t eat vegetables. . . I only eat french fries.” During a week-long visit with his grandparents, Oliver agrees to eat other vegetables only if he can’t identify the potatoes in the garden. As the week passes, carrots, spinach, rhubarb, cabbage, beets, and peas are pronounced not only edible, but “delicious.” A close observer will note that Oliver eventually ate roots, tubers, leaves, stems, and fruit: not bad for a boy who does not eat vegetables!

George, Lindsay Barrett. *In the Garden: Who’s Been Here?* New York: Greenwillow Books, 2006. During their excursion to the garden, two children and their dog find clues that other animals are, or have been, benefitting from the familiar plants there. Large, richly colored illustrations invite close observation and follow-up conversation. Additional information about the featured animals is provided.

Gibbons, Gail. *The Vegetables We Eat*. New York: Holiday House, 2007. “Look at all the vegetables” is putting it mildly! This book is packed, at pre-school conversation level, with text and pictures about those plants called vegetables. Nutrition; different vegetable groups, based on the edible part; and growing vegetables, both at home and on farms, are all presented. Text appears on two levels, a sentence or two at the bottom of most pages, and then labeling and additional information within the illustrations. Colorful pictures, while not photographs, are realistic looking. Some of the smaller and busier ones work better in small groups.

Hall, Zoe. *Fall Leaves Fall*. New York: Scholastic, 2000. Two siblings joyfully watch and try to catch leaves, followed by stomping, kicking, collecting, comparing, and raking them into a pile to jump into. The colorful illustrations show maple, ginkgo, sassafras, beech, and oak leaves. The last page describes leaf growth from spring to winter, and mentions that some leaves do not change color or fall from trees in autumn.

Hall, Zoe. *It’s Pumpkin Time*. New York: Blue Sky Press, 1994. The purpose of growing pumpkins for this young brother and sister is obvious from the beginning: their favorite holiday is Halloween and they plant seeds in a jack-o-lantern patch. Colorful painted-paper collages and appropriately limited text provide the details of how pumpkins are grown from seed to harvest—or carving in this case.

Plant Life

Hall, Zoe. *The Apple Pie Tree*. New York: Blue Sky Press, 1996. In spite of the apple emphasis in the title, the children's tree has multiple uses in this book about growth and change. But the best part of the tree is the pie prepared in the autumn at picking time. Colorful collage illustrations detail the seasonal changes described in the appropriate text. Animal (including two children) activities add observation interest. The author's apple pie recipe and information about the role bees play in apple growth are included.

Heller, Ruth. *The Reason for a Flower*. New York: Grosset and Dunlap, 1983. Vivid illustrations and simple but accurate (except for the mushroom at the end) rhythmic text explain the purpose for flowers—seed production. The variety of ways seeds travel, how they grow, and their uses (including non-food) also are discussed.

Hickman, Pamela. *A Seed Grows: My First Look at a Plant's Life Cycle*. Toronto: Kids Can Press, 1997. This gentle story tells about Sam and the seed he plants, in the cumulative style of "the House that Jack Built." Fold-out pages hide more detailed information about plant growth and gardens, and/or suggest things for children to find in the pictures. The small-book format limits the book's use to small groups or individuals, but still provides opportunities for detailed conversations.

Himmelman, John. *A Dandelion's Life*. New York: Children's Press, 1988. Who would guess that so much could happen to a dandelion during one year? From a dandelion seed's initial float through the air and ride on the chipmunk, through sprouting and flowering, through various visitors (including a lawnmower), the dandelion lives to bloom again and again. Text is limited to one or two sentences per page, but the action is in the realistically detailed illustrations that encourage keen observations and conversation.

Jeffers, Dawn. *Vegetable Dreams/Huerto soñado*. Green Bay, WI: Raven Tree Press, 2006. A little girl's dream about a garden, plus an elderly neighbor willing to help, begin a lesson in gardening and friendship. The harvest is so bountiful that tomato and pickle canning is possible. Text is arranged with English on the top half of left-hand pages and Spanish on the bottom. Full-page illustrations on the opposite pages are impressionistic pastels which are different from most children's books. An English/Spanish vocabulary is added.

Jordan, Helene J. *How a Seed Grows/Como crece una semilla*. New York: HarperCollins, 1992. Directed by a young girl, readers learn about seeds, beginning with the idea that different plants grow from different seeds. Using the 12 bean seeds that she plants in temporary containers, she shows how the seeds change as they grow, giving directions about light and water along the way. A final page outlines an experiment showing the effects of water/non-water and light/dark on plant growth.

Plant Life

Kottke, Jan. *From Acorn to Oak Tree*. New York: Children's Press, 2000. Simple text and close-up photographs explain how an oak tree grows from an acorn (oak seed) and then produces more acorns. Other plant titles in this small format series include *From Seed to Pumpkin* and *From Seed to Dandelion*.

Krauss, Ruth. *The Carrot Seed/La semilla de zanahoria*. New York: HarperCollins/Scholastic, 1945. Simple 4-color line drawings illustrate the story of a young boy who plants and tends to a seed that grows into a huge carrot, in spite of his family's pessimism. The size of the eventual growth could be a fun topic for discussion. Also available in big-book format.

Lehn, Barbara. *What Is a Scientist?* Brookfield, CT: Millbrook Press, 1998. Simple text and color photographs describe how scientists learn from their senses, observe details, ask questions, communicate their findings, and have fun as they experiment. Children demonstrate each of the tasks. 1999 NSTA Outstanding Science Trade Book for Children

Legg, Gerald. *From Seed to Sunflower*. Danbury, CT: Franklin Watts, 1998. Sunflowers begin as seeds. Their germination, roots, growth, flowers, pollination, and withering are the story followed in this book that ends with more seeds for next spring. Illustrations are bright, close-up, and labeled. Text is sometimes ample, but can be edited as appropriate for young children. Additional facts, a glossary, and index are at the end.

Levenson, George. *Bread Comes to Life: A Garden of Wheat and a Loaf to Eat*. Berkeley, CA: Tricycle Press, 2004. After several pages of yummy-looking breads, beautiful color photographs of wheat seeds begin the process of making those products. Close-ups and simple poetic text filled with descriptive words show ripe heads of grain, measuring tools, ingredients, dough, and all the steps in-between. Several projects, including a recipe with directions for "any 4-year-old, with an adult helper," are added.

Levenson, George. *Pumpkin Circle/El círculo de las calabazas*. Berkeley, CA: Tricycle Press, 1999. Poetic rhyming text explains how a pumpkin patch changes when a seed becomes a plant which grows fruit and produces more seed. Oranges, greens, blacks, and browns make striking contrasts in the photographs, some so close up that you can see the hairs on the vines. A concluding page provides more detail about growing pumpkins. 2000 NSTA Outstanding Science Trade Books for Children

Lin, Grace. *The Ugly Vegetables*. Watertown, MA: Talewinds, 1999. A young girl (who helps her mother plant seeds) notices several differences among the neighborhood gardens, both as they are planted and in the results. Neighborhood appreciation for the delicious soup her mother makes from the "ugly" Chinese vegetables in their garden means changes in everyone's garden next year.

Plant Life

Lyon, George Ella. *ABCedar; an Alphabet of Trees*. New York: Orchard Books, 1989. Minimal but poetic text and earth-tone illustrations provide alphabetical examples of various tree leaves and fruits/seeds. Human hands holding the leaves allow relative size comparisons. Small black and white people and trees also provide relative size and shape information. An uppercase alphabet runs across each double-page spread. Because the text is so minimal, careful observation and conversation are required.

McCarthy, Mary. *A Closer Look*. New York: Greenwillow Books, 2007. Bold collage illustrations and simple, sparse text place an emphasis on observation. An isolated part of an object is shown with encouragement to “look!” Pages following then pull back for a second and third look before revealing a ladybug (albeit “a bug”). A flower and hummingbird are treated similarly, until all three are put together on a plant, and eventually in a flower garden.

McMillan, Bruce. *Growing Colors*. New York: HarperCollins, 1988. The colors of the natural world are taught in vivid photographs of fruits and vegetables. Text is limited to one uppercase, color word per double-page spread. One smaller photograph of the appropriate plant is opposite a large, close-up photo of a plant part of that color. A key in the back matches colors, mini-photos, and fruits/vegetables, but most will be familiar.

Mitchell, Melanie. *Potatoes*. Minneapolis, MN: Lerner Publications, 2003. Photographs and simple text explain the life cycle of potatoes (a common non-seed vegetable). The book concludes with an illustrated potato life cycle, several additional potato facts, glossary, and index. The Life Cycles series includes a similar book on tulips, another non-seed plant.

Moss, Miriam. *This Is the Tree*. Brooklyn, NY: Kane/Miller, 2000. Africa’s baobab tree is a great example of a plant providing both shelter and nourishment for numerous animals. Its strange look is attention-getting, even within these two-dimensional colorful, detailed illustrations. The final two pages about the tree’s parts provide additional information for teachers. 2001 NSTA Outstanding Science Trade Books for Children

Oppenheim, Joanne. *Have You Seen Trees?* New York: Scholastic, 1967. Brilliant watercolors add to the delight of this rhythmic, rhyming celebration of trees in all seasons. Each scene is worthy of a conversation about the details pictured there, even the silly literal-names page. The concluding facts about 16 different trees may interest children.

Peterson, Cris. *Harvest Year*. Honesdale, PA: Boys Mills Press, 1996. Children from all over the country can see something familiar in this photographic essay. While the specific months and locations will not mean much to young children, the variety of crops will help them understand where our food comes from. Text is ample, but just looking closely at the photos can encourage conversation.

Plant Life

Pfeffer, Wendy. *From Seed to Pumpkin*. New York: HarperCollins, 2004. Step by step, from a farmer planting seeds through harvest and preparing for next season's crop, this book shows how a pumpkin seed grows into a pumpkin. The text provides some detail, but in simple explanations that could become topics for conversation. Included at the end are instructions for roasting pumpkin seeds and an experiment to show how plants drink water.

Posada, Mia. *Dandelions: Stars in the Grass*. Minneapolis, MN: Carolrhoda Books, 2000. Weed or "noble breed?" The placement and color of appropriately limited rhyming text about the dandelion's life cycle almost becomes part of the artwork. Close-up illustrations are gentle and yet vibrant earthtones. More dandelion facts, a recipe, and science activities are provided at the end of the book. 2001 NSTA Outstanding Science Trade Book for Children

Richards, Jean. *A Fruit is a Suitcase for Seeds*. Minneapolis, MN: First Avenue Editions, 2006. Using the metaphor of a suitcase, the book describes how fruits protect and disperse seeds. Illustrations show fruits with one seed, many seeds, and seeds on the outside. The difference between fruits and vegetables is also addressed. The book can serve as a good beginning to planting seeds or dissecting fruits and vegetables.

Robbins, Ken. *Autumn Leaves*. New York: Scholastic, 1999. This album of autumn leaves includes the leaves of 12 varieties of trees shown in life-size full-color photographs on one page, with a photograph of the tree or some of its branches facing it. The crisp and colorful photographs are accompanied by one or two simple sentences describing a characteristic of the leaves. An explanation for why leaves turn color concludes this wonderful resource. 2000 NSTA Outstanding Science Trade Book for Children

Robbins, Ken. *Pumpkins*. New Milford, CT: Roaring Brook Press, 2006. Striking photographs tell the story of the pumpkin that typifies the autumn season. Accompanying text is appropriately limited but adds adequate narration. Also included are the steps for turning pumpkins into jack-o-lanterns and using them at Halloween.

Rockwell, Anne. *One Bean*. New York: Walker and Co., 1999. A young boy and girl discover what happens to a bean as it is soaked, planted, watered, re-potted, and eventually produces pods with more beans inside. Gentle, realistic drawings provide details to be observed even beyond the seed project. The text is an appropriately simple narration of a plant's life cycle.

Rosenberry, Vera. *The Growing-up Tree*. New York: Holiday House, 2003. When Alfred is only a little baby, his mother plants several apple seeds. Thereafter, the lives of the apple tree and Alfred calmly parallel each other, until both die during the same storm. Yet both live on in the offspring around them. Watercolor drawings are bright, stylized and show growth in both the tree and boy.

Plant Life

Schaefer, Lola M. *This Is the Sunflower*. New York: Greenwillow Books, 2000. The tall sunflower that stands in the garden eventually provides seeds for the songbirds that, in turn, spread the seeds so new sunflowers can grow. The cumulative text has compelling rhythm and some rhyme. Watercolor illustrations sometimes change perspective but provide a sense of movement. Both the sunflower life cycle and the role of the birds in the process will make interesting conversation. A bird identification key and additional sunflower facts conclude the book.

Stein, David Ezra. *Leaves*. New York: G.P. Putnam's Sons, 2007. A curious young bear wonders about the falling leaves during his first autumn. He thoughtfully but unsuccessfully tries to put them back on the trees. His child-like joy at discovering tiny new leaves in the spring is wonderful. Text is spare and perfect for the watercolor-looking illustrations. They too are minimal but filled with the details that inspire close observations and conversation.

Stevens, Janet. *Tops and Bottoms*. San Diego, CA: Harcourt Brace, 1995. In this vertically formatted story, a lazy bear eventually learns from an industrious rabbit family that different parts of different plants are edible, and he needs to pay attention to which is which. The mixed-media drawings are perfect stimulation for conversation about both the gardening experience and the trickster theme. 1996 Caldecott Award Honor Book

Wallace, Nancy Elizabeth. *Apples, Apples, Apples*. Delray Beach, FL: Winslow Press, 2000. A rabbit family enjoys a day picking apples at Long Hill Orchard. A chart helps them decide what kind of apples they want for their various projects. Along the way, Mr. Miller provides apple information and Minna recalls some things she read in her apple book. An applesauce recipe, apple print instructions, song, and page of apple sayings are included. Good descriptive words fill the text, while cut-paper illustrations add detail.

Wallace, Nancy Elizabeth. *Leaves! Leaves! Leaves!* New York: Marshall Cavendish, 2003. Mama Bear teaches Buddy Bear about leaves as they explore the outdoors during all the seasons. Useful scientific tools are available to aid their work. Colorful cut-paper illustrations and simple, accurate, conversational text tell the story. Both text and pictures contain enough detail to stimulate observations.

Wallace, Nancy Elizabeth. *Seeds! Seeds! Seeds!* New York: Marshall Cavendish, 2004. Buddy Bear, with his mother's help, explores the packages of seed activities he receives in an unexpected box from his grandfather. Clean cut-paper illustrations and accurate text tell the story as he creates a seed collection. Illustration details provide opportunities for observing and even reading the accompanying labels, instructions, etc.

Plant Life

Weninger, Brigitte and Anne Möller. *Precious Water: A Book of Thanks*. New York: North-South Books, 2000. A clear glass of water is the introduction to “all things need water.” While plants do not dominate the examples, they are represented. Collage pictures and limited text are sufficiently detailed for good discussion.

