

CONTENTS: PLANTS KIT

Materials in this Story Time STEM Kit:

Guide

- 3-ring binder of resources

Shared Reading Books with 4 Bookmark Guides

- *Weeds Find a Way* by Cindy Jenson-Elliott
- *Living Sunlight* by Molly Bang and Penny Chisholm
- *A Seed is Sleepy* by Dianna Hutts Aston and Sylvia Long
- *Flip, Float, Fly* by JoAnne Early Maken

Resource Books

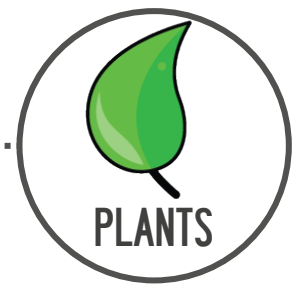
- *Planting the Trees of Kenya* by Claire A. Nivola
- *A Tree is a Plant* by Clyde Robert Bulla

Extension Activity Materials

- Felt cut-outs (4 stages of a plant)
- Large brown felt background
- Plants card game and instructions

[TABLE OF CONTENTS]

• Guide Contents	2
• Introduction & Concept Overviews	3
• Shared Reading Books: Science & Math Overviews	11
• Resource Books: Overviews	16
• Extension Activities & Resources	18
• Connections to Standards	23



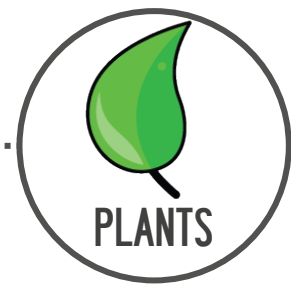
GUIDE CONTENTS

This guide is your resource for science information about plants and for exploring science, math and literacy ideas. Each part of the guide serves a different purpose and can be used flexibly to suit your needs and goals with young learners:

- **Conceptual overview:** Provides general information about plants, as well as how this concept is addressed as themes in each of the shared reading books.
- **Shared reading book information:** Provides themes, science concept overviews, and math ideas for each of the four the shared reading titles. (Planning guides for the shared reading are in the front pocket of the 3-ring binder.)
- **Resource book information:** Explores science concepts about plants with factual information, diagrams and a glossary.
- **Extension activities and resources:** Provides ideas for activities you can do with children to extend their exploration of plants.
- **Connections to Standards:** Makes links to the Next Generation Science Standards (NGSS) and Common Core State Standards in Mathematics (CCSS-M) and Common Core State Standards in English Language Arts (CCSS-ELA)



[STORY TIME STEM]



INTRODUCTION

Story Time STEM kit uses **shared reading experiences** to explore plants, something that is part of daily life in many ways! Children experience literacy, math, and science concepts in their daily lives too. There are many math, science, and literacy concepts within each book in this kit, providing opportunities for engaging in rich discussions with young learners.

Discover some of the following STEM themes together:

- **Seeds:** Seed dispersal, different kinds of seeds
- **Plants:** parts of a plant, photosynthesis, seed growth into plants
- **Ecosystem connections:** Seeds, plants, insects, & animals and their connection to people, food, and the land
- **Representing** and solving addition, subtraction, and multiplication problems
- **Making sense** of problems and persevering in solving them
- **Constructing** viable arguments
- **Extending** the counting sequence
- **Describing** and comparing attributes
- **Analyzing** and compare shapes
- **Classifying** objects

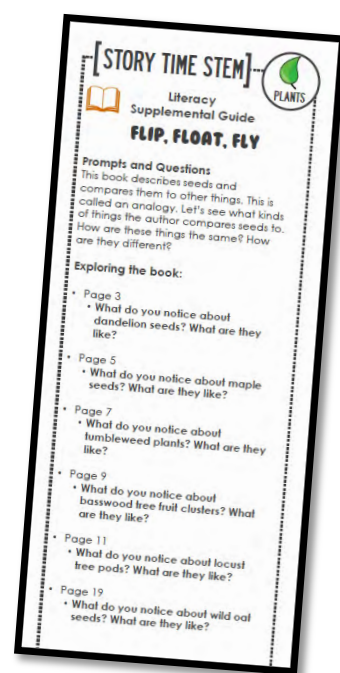
Bookmarks

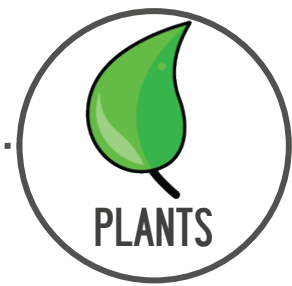
The included bookmarks offer questions about science, math, and literacy. Each has a different focus:

- **Guiding Questions or Anytime Questions:** Questions to ask children to help them think about ideas and be part of meaningful discussion. These can be asked with any book at any time! What do you wonder? (These bookmarks are in the front pocket of the 3-ring binder.)
- **Integrated:** Questions and prompts to use before, during and after reading that address key science, math, and literacy ideas in the story.
- **Math/Science:** Questions and prompts to use before, during and after reading that focus on math and science ideas in the story. What (numbers, patterns, shapes) do you see?
- **Literacy:** Questions and prompts to use before, during, and after reading that focus on literacy ideas and language in the story. What do you think will happen next?

Read the books more than once!

1. Read the story a first time using some of the questions and prompts from the 'Questions as Refrain' or 'Integrated' bookmarks. Enjoy the story!
2. Then, based on children's interests, read the story again - at that moment or a different time - using the math/science or literacy bookmark. Children love to explore good books many times!





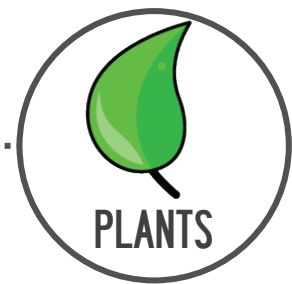
CONCEPTUAL OVERVIEW

Children from all backgrounds, abilities, and ages have observational skills that they use in their daily lives. Most children are natural investigators and can readily ask questions about the events and process occurring in the natural world. Young learners are primed to use their experiences, observation skills, and natural questioning abilities to engage with math, literacy, and science concepts explored during shared reading times with picture books. It is helpful to consider children's ideas and questions as resources as we read the guides to plan for the questions that are posed to engage them in the critical thinking process.

Children experience literacy, math, and science concepts simultaneously during their daily lives. During mealtimes, going shopping at the grocery store, or playing outdoors, all children are naturally experiencing plants as they interact with food, forests, and plants. Integrating literacy, math, and science concepts within this kit allows for creating a flexible space in which young learners can authentically engage in math and science storytelling.



The integration of these subjects allows for an intentional practice of transferring the lived experiences of students with plants into a structured set of shared reading experiences intended to deepen children's understanding of the ways that they can see the math, science, and literacy in our everyday interactions with plants.



TITLES OVERVIEW

Many of the questions in this guide are open-ended. These types of questions allow children to share ideas they are thinking about while they engage with the story. By asking open-ended questions, adults can learn about the ways children are making sense of concepts and encourage multiple solutions. Asking open-ended questions also signals to children that their ideas are valuable, worth listening to, and worth discussing. As children come to see their own ideas as valuable, they are encouraged to think more deeply—whether or not an adult is present. Sometimes an open-ended question results in an unexpected answer. Allowing for a flexible and inclusive discussion space offers the opportunity for children to “practice” sharing ideas as they learn how to participate productively during shared reading times.

The following books all have plants as a central focus. There is a wide variety of math, science, and literacy concepts within each book, providing many opportunities for discussing ideas with young learners.

The guides support adults by offering questions that help children think about, explore, and discuss the text and illustrations in each book. In some cases there are multiple stopping points within each book. Consider your audience's age and developmental skills when determining which questions to focus on, and how to extend the learning through the included after-reading activities and investigations. Look for cues throughout the guide for ideas about how to target your use of this kit to different ages and developmental levels.

We encourage you to try some questions you may not feel entirely comfortable with, as well as to try any other activities that you imagine together with your children!

Shared Reading Titles:

- **Weeds Find a Way** by Cindy Jenson-Elliott is a non-fiction illustrated story about how certain plants are very good at surviving in different places.
- **Living Sunlight** by Penny Chisholm focuses on the importance of the sun in relation to all life on Earth, particularly plant life and how sunlight allows for photosynthesis on land and water plants.
- **A Seed is Sleepy** by Dianna Aston and Sylvia Long tell a beautifully, illustrative story about seeds using literacy based vocabulary, phrases, and informational text.
- **Flip, Float, and Fly** by JoAnne Maken focuses the audience on the different ways seeds are dispersed and on the journeys of different seeds.

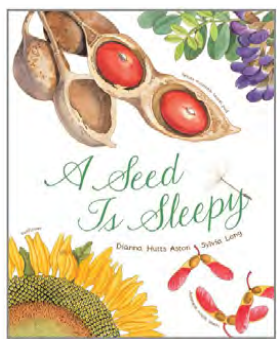
Resource Book Titles:

- **A Tree is a Plant** by Clyde Robert Bulla, describes the life of an apple tree and includes aspects of seed to plant growth, pollination, and seasonal changes.
- **Planting the Trees of Kenya** by Claire Nivola narrates a story of a young girl's experience with deforestation. This book tells the journey of a community action project to replant the trees and bring back the health of the people, the animals, and the land.



MATH CONCEPTS

Story time is an exciting time to have mathematical conversations with children! **All books, whether math is central to the story or not, offer opportunities for thinking about mathematics.** Through the story contexts and engaging illustrations, children can notice and reason about a wide range of mathematical ideas. The open-ended questions built into the reading guides are designed to prompt children's mathematical thinking and nurture their identities as mathematicians!

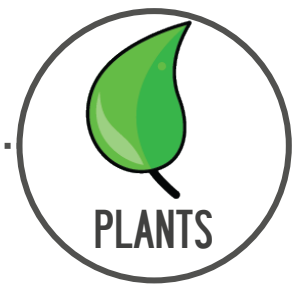


For example, in the book *A Seed is Sleepy* children can notice and wonder about sunflower seeds. We can invite children to estimate how many seeds they see, count the seeds, and explain how they are keeping track of how many seeds. Inviting children to ask their own questions, as they notice and wonder, nurtures their sense of self as mathematicians--people who observe and ask questions about their world.

Another rich opportunity within this toolkit is to work on the dispositions of young mathematicians. For example, in the book *Weeds Find A Way*, the way the seeds spread and persist can be likened to the way mathematicians' ideas spread and the way they persevere in solving problems. You could read this story with a mathematical lens in two different ways. One way would be to think of the seeds and weeds through the mathematical ideas and problem solving analogy. Another way could be to invite children to count and notice things on the pages.



Books about plants and their seeds offer opportunities for young mathematicians to consider and count larger quantities than are usually offered in picture books. Thinking about what one hundred, or one thousand, or even one million (as with orchid seeds) can be exciting and help children to form ideas about what larger quantities look like. Children can listen to you counting by 50s, or 1000s, and might try "skip-counting" by these bigger numbers on their own.



MATH CONCEPTS

The different kinds of seeds explored in these books offer excellent opportunities for children to describe shapes, compare attributes (such as weight or shape), and classify seeds into categories (such as how they are dispersed). **Have lots of fun exploring the ideas that children seem most interested in talking about!** Below is a list of ideas that you might explore together. Sometimes you might just wonder about a concept, while at other times you might talk more deeply about an idea. Both are useful.

The math ideas in the plants kit books include:

- Representing and solving addition, subtraction, and multiplication problems
- Making sense of problems and persevering in solving them
- Constructing viable arguments (for example, "I think there are 6 because there are 2 on this page and 4 on this page and 2 plus 4 equal 6")
- Extending the counting sequence (including counting larger groups, "skip-counting" by larger numbers, and gaining a sense of very large numbers)
- Describing and comparing attributes
- Analyzing and comparing shapes
- Classifying objects (seeds that travel on the water, seeds that travel through the air)



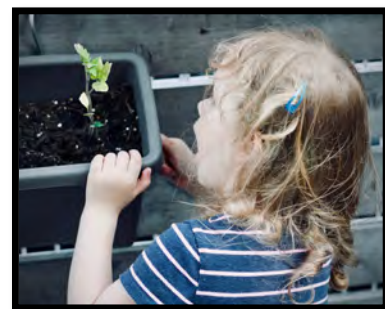


SCIENCE CONCEPTS

Exploring the stories in this kit gives children opportunities to learn, think about and focus on plants as a central science concept in a variety of ways and learning styles. Each book in this kit focuses on different aspects of seeds and plants. *A Seed is Sleepy* exposes readers to a rich, visual exploration of the colors, textures, and other physical features of seeds. Children will explore concepts related to seed diversity and the structure-function relationships found in seeds. In *Flip, Float, Fly* learners think about traveling seeds and uncover the different ways that seeds move around and are transported to different places. Weeds are reframed as a story of plant resilience when children read *Weeds Find a Way*. The incredible dynamics of apple trees are unfolded while reading *A Tree is a Plant* and in *Living Sunlight* the energy story is uncovered in relation to all plants on Earth. Finally, *Planting the Trees of Kenya* is a story about activism where a woman is able to use her voice to heal her land and community by planting trees with many different kinds of people. These books and guiding questions allows educators, parents and facilitators the opportunity to integrate the Next Generation Science Standards, literacy, and storytelling through the use of picture books.

Big science ideas in this kit include:

- Plants need sunlight and water to grow
- Animals disperse seeds and insects pollinate plants
- Interdependent relationships in our ecosystem support seed dispersal and new plant growth
- The shape and structure of natural objects are related to their functions



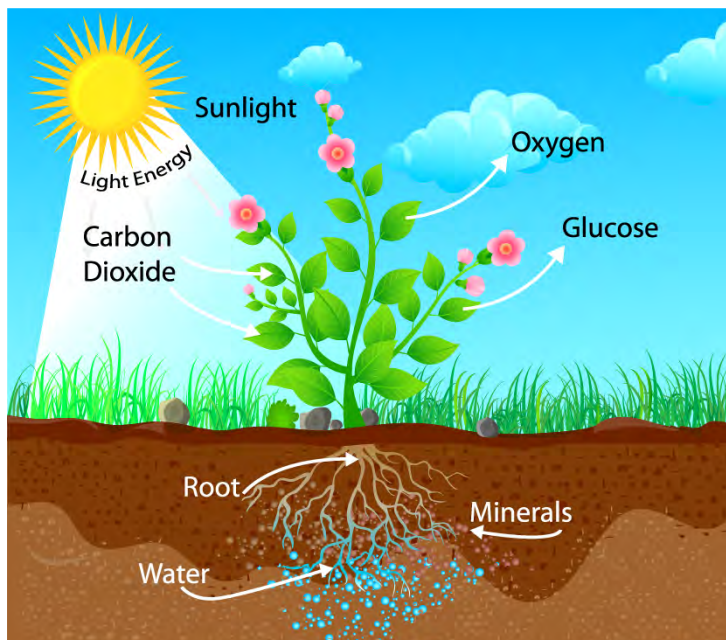


SCIENCE CONCEPTS

Energy in the Plants Kit

Energy is defined as the ability to do work; it powers everything in nature. Energy warms and cools our homes, fuels our cars, and powers our electronic devices. And it takes energy for us to walk, talk, digest, and breathe. There are different kinds of energy such as nonrenewable (coal, oil, natural gas) and renewable (wind, sun, water, trees/plants).

Trees produce and conserve energy as they prevent erosion, reduce water pollution, slow the wind, regulate the earth's temperature, keep the air clean, provide shade, and muffle noise. Trees and other green plants are the energy basis for all animal life to grow and function. Through the process of photosynthesis, plants convert light (solar energy) from the sun into chemical energy that is stored in the plant as carbohydrates (sugars) as it grows. All animal life, including humans, depend on that stored energy. When you eat an apple, the chemical energy stored within the fruit becomes the energy "fuel" that allows you to work, run, play, and grow. Every living creature either gets its energy directly from plants or depends on other species that depend on plants.



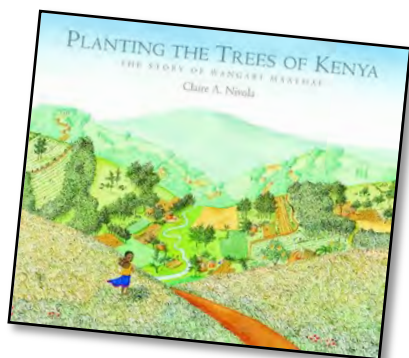
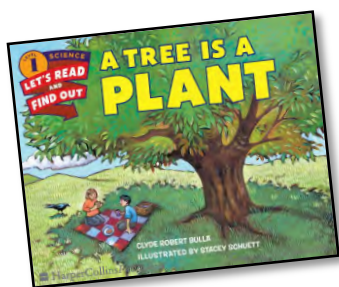
1. Stored energy in the seed is used to produce a sprout.
2. The emergence of leaves on the seedling means that the plant can now make its own food through photosynthesis using sunlight, water, and air (carbon dioxide) to make a type of sugar food for the trees.
3. The leaves continue to make food for the tree and apple growth all spring and summer long. The light energy from the sun is transferred to the leaves, which then is transformed to sugar (chemical energy) and transferred to the tree and to the apples.



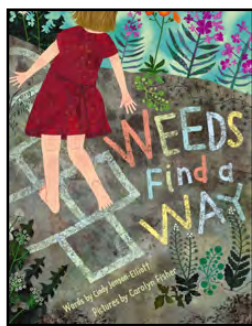
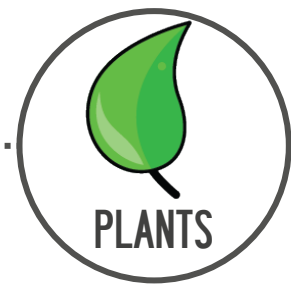
LITERACY CONCEPTS

Each of the four shared reading books in this kit feature information about plants with connections to the lives of animals and/or people. There is a range of sophistication in terms of information and events, from fairly simple and straightforward (*Weeds Find a Way*) to more complex (*A Seed is Sleepy*; *Flip, Float, Fly!: Seeds on the Move*) to rather sophisticated (*Living Sunlight: How Plants Bring the Earth to Life*). The following concepts may be emphasized when exploring these books with children:

- Making connections between text and illustrations
- Retelling events and details in a story and identifying important ideas
- Comparing and contrasting different plant features or attributes
- Making connections between information in the books and personal knowledge and experience



The resource books explore ideas about plants using a story (or narrative) structure. *A Tree is a Plant*, while informational (nonfiction), follows a narrative structure, exploring the life of an apple tree from seed to fruit-bearing tree. The other resource book, *Planting the Trees of Kenya: The Story of Wangari Maathai*, tells the story of a Nobel Peace Prize winner who worked to help restore the environment and ecosystem of her homeland in Kenya by replanting trees. These books, while perhaps a bit long to read aloud in one sitting, work well for exploring science concepts and also for considering a story sequence as well as before-during-after events.



WEEDS FIND A WAY

By: Cindy Jenson-Elliott



Science Conceptual Overview

Weeds Find a Way is the story of how different kinds of plants overcome obstacles, such as human-created impacts, to grow and thrive. This book is illustrated in a way that brings young learners into the stories of the strength, adaptability, and resilience of weeds. As a result of certain kinds of plants having particular adaptations, they have been able to grow in sidewalks in urban areas and in large fields out in the country. Many times weeds are so abundant because the seeds were brought to different lands by people traveling or migrating. Other times weeds such as dandelions, seem to be all over grassy areas because seasonally they are some of the first foods available after winter for pollinators such as bees.

[FOCUS THEMES]

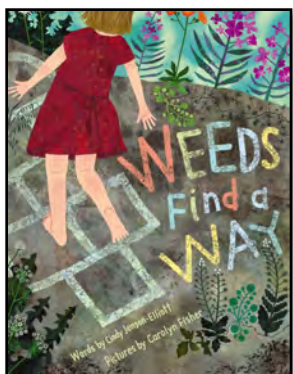
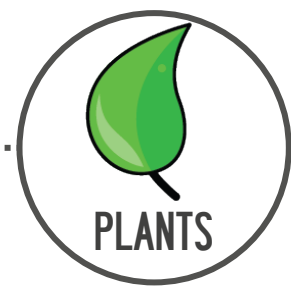
- Cause and Effect
- Patterns
- Forces and Motion



Young scientists may enjoy spending time with an adult or educator talking about personal weed stories. Consider using the pictures in the book to share ideas or engage in questioning or storytelling. Through engaging children in thoughtful conversations, this book will help readers consider developing an appreciation for these plants that we call weeds!

Big ideas in Science:

- Making observations of the different needs of plants and animals
- Using the illustrations as a model to identify relationships between seeds, insects, water, weather, and people.
- Discussing the differences between how and where seeds grow.



WEEDS FIND A WAY

By: Cindy Jensen-Elliott

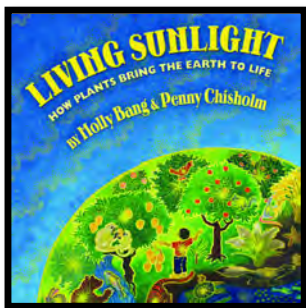
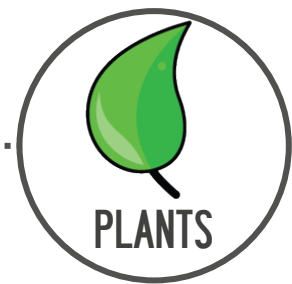
Mathematics Conceptual Overview



This book offers a rich opportunity to work on the dispositions of young mathematicians. For example, the ways the seeds spread and the weeds persist, can be likened to the way mathematicians' ideas spread and the way mathematicians persevere in solving problems.

You could read this story with a mathematical lens in two different ways:

- One way would be to think of the seeds and weeds through the mathematical ideas and problem solving analogy.
- Another way could be to invite children to count and notice things on the pages.



LIVING SUNLIGHT

By: Molly Bang and Penny Chisholm

Science Conceptual Overview



Living sunlight is a wonderfully detailed book with a tremendous amount of science illustrations and concepts to explore with young scientists. This informational book was written by an ocean scientist and a children's author to share their knowledge and the importance of interdependency of all life on Earth fueled by the sun.

This book simplifies for readers many very complex science concepts such as photosynthesis, energy, and life cycles. *Living Sunlight* asks readers to consider role of plants, insects, animals, the sun, water, air, and nutrients in the ground, and how these factors work together within a variety of ecosystems. Using this book with young learners can visually support children in engaging with the science themes and concepts to share ideas and personal experiences with the events and processes present in these pages.

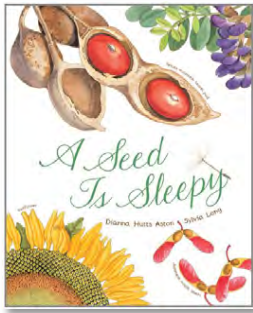
Big ideas in Science:

- An **ecosystem** can be thought of as a functional unit that includes a community of living organisms (**biotic factors**) and nonliving parts of the environment (**abiotic factors**) that work together.
- Energy plays an important role throughout all parts of this book.

Mathematics Conceptual Overview



Living Sunlight offers rich opportunities for comparing. For example, children can compare the length and width and height of the plants to one another. They might also make comparisons between root systems and the part of the plants we can usually see. There are also opportunities to consider very large quantities, such as the number of leaves on trees.



A SEED IS SLEEPY

By: Dianna Hutts Aston and Sylvia Long



Science Conceptual Overview

This informational book opens up a new world for adults and children to use seed illustrations for engaging in dynamic conversations about the diversity of seeds, seed parts, and seed stories. Seeds are a part of our daily lives when we eat foods, go to the grocery store, or take a walk outside. We are seldom far from seeds or seed producing plants.

This book also contains short poetic captions and phrases that invite the reader to develop new perspectives on seeds by exploring seed facts and stories.

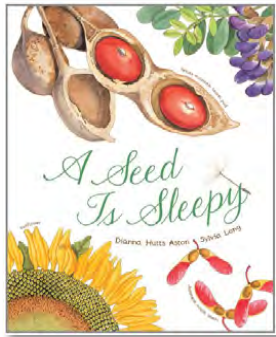
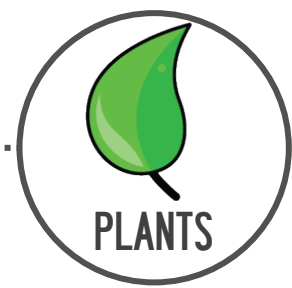
An adult will be able to use a variety of creative strategies for reading this book, even just focusing on one page with a group of young scientists. The dialogue that is created around these illustrations will allow children to share related ideas, stories, and comments that can support children to think deeply about seeds, their needs and structures, and our dependence on them.

Big ideas in Science:

- The structures of seed parts each have unique functions.
- There are patterns to the structures of seed parts.
- Seeds need certain resources such as water and sunlight to sprout, grow and thrive.

[FOCUS THEMES]

- Patterns
- Parts and Systems
- Energy
- Interdependent Relationships
- Seed Diversity



A SEED IS SLEEPY

By: Dianna Hutts Aston and Sylvia Long

Mathematics Conceptual Overview



The book *A Seed is Sleepy* offers opportunities for children to consider various mathematical concepts while they build their identities as mathematicians.

We can ask children what they notice and wonder about sunflower seeds.

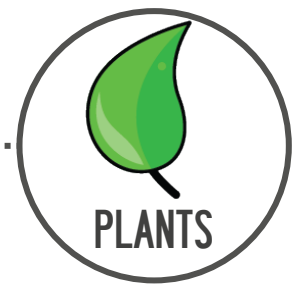
We can invite children to estimate how many seeds they see, count the seeds, and explain how they are keeping track of the number of seeds.

Inviting children to ask their own questions as they make observations and wonder, nurtures their sense of self as a mathematician.



Mathematicians are people who observe and ask questions about their world.

[STORY TIME STEM]



RESOURCE BOOKS

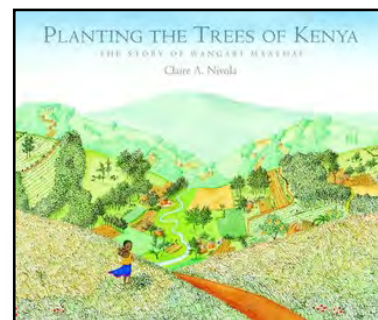
Planting the Trees in Kenya: The story of Wangari Maathai

By Claire A. Nivola

This book is a story about activism and about understanding our connection to the land, the plants, and the animals. This book is based on a true story and can be used to inspire young children to take an active role in promoting environmental sustainability as humans can have negative and positive impacts on the land.

Questions:

- What do you see happening in the pictures?
- What happened to the people when Wangari came back from school?
- What happened to the food people ate?
- What happened to the land because the trees were all cut down?
- What was Wangari's solution to the problem?
- How did Wangari plant the trees? Who helped her plant the trees?
- After the trees were planted, what happened to the people (health)?
- Who did Wangari give seedlings to?
- How many trees have been planted? Is 30 million a lot of trees or a little?



Activity: Pocket Gardens

How to Sprout a Bean Plant – Garden in a Bag

What happens to a seed when you plant it in the soil? When we plant seeds they first sprout or “germinate.” When planted in the soil, we’re unable to see the first sprout push out of the seed coat or see the root system. In this activity, you will be able to observe germination and the plant’s roots.

Materials (not provided in kit)

- Clear zip sandwich bags
- Dry beans
- Paper towels
- Permanent marker

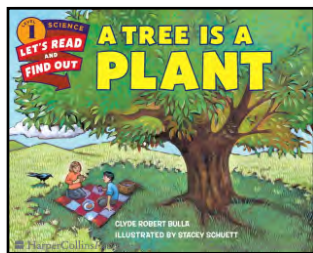
Instructions

1. Distribute a zip sandwich bag to each child and write their name in the top corner with a permanent marker.
2. Dampen a paper towel per child and have them place the folded towel in the bag. Paper towels should be damp enough to provide moisture for the bean, but not dripping (which could cause mold).
3. Have children place a dry bean on top of the damp paper towel and seal the bag. There does not need to be any air in bag.
4. Children can carry the bags around in their jacket pockets or tape each bag to a window or a wall which gets some sunlight. The seed (bean) mostly needs warmth at this stage, not light – so prioritize for warmth. A window helps for viewing the seed as it germinates.
5. The seeds should begin to germinate in 3-5 days. Moisten the paper towels if they are drying out.
6. Have children observe the growth of the sprouts. You can have older children (age 4 and older) record the growth on a piece of paper, to the best of their ability. For example, the first sketch should be on Day 1, showing the bean in the bag. The second sketch could be the first sprout, etc.
7. After 1 ½ to 2 weeks – either in a garden or indoors – transplant the sprouted seeds if soil is available. When the seeds are planted they will have their “seed leaves” and maybe even their “true leaves” (the second leaves after the “seed leaves”). These should be above the soil so the seed can continue to grow. Beans require a fair amount of warmth so may not grow well outside in the winter. However, in a sunny classroom spot with good soil and water, they may grow enough to give an idea of what they look like as a full grown plant.



Modified from

http://www.mda.state.mn.us/en/sitecore/content/Global/MDADocs/kids/bookbundle/glove_garden.aspx



RESOURCE BOOKS

A Tree is a Plant
By Clyde Robert Bulla

The following activity can be modified to suit the needs, ages, and learning environment in which you will be reading this book. Consider your audience and your limitations when reading the following lesson guide.

Exploring Apples

Young learners will examine apples using scientific tools and engage in a conversation/ discussion about the parts and functions of an apple using their observations, informational text, and scientific drawings. The adult will read "A Tree is a Plant" at the end of this lesson or as an added mini-lesson. Children will develop an emergent understanding of the structure of an apple and the function of the apple parts in order to understand how a system works and functions through detailed observations and discussions about the purpose of the design of an apple in relation to seed dispersal by people and animals.

Child-Friendly Learning Objectives:

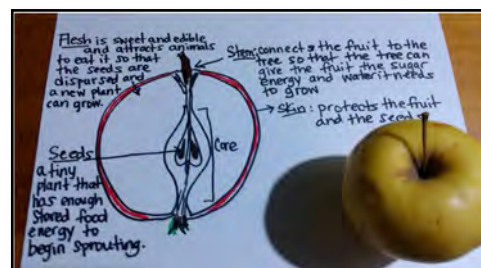
- I can learn about why the parts of an apple are important to the apple seed.
- I can share my ideas about how animals help to move seeds to new places.
- I can share my ideas about why there are different kinds of apples.

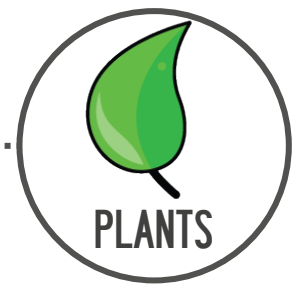
Materials (not provided in kit)

- Class Chart Paper on display
- Books: *A Tree is a Plant* By Clyde Robert Bulla
- A blank piece of drawing paper
- Pencils, colored pencils, thin markers, optional crayons
- Different types of apples

Procedure

1. Have at least 2 different kinds of apples cut in half vertically to show the core with the seeds. Allow children to make observation of the parts of an apple with a hand lens or magnifier for a few minutes as they may need time to settle into the hands-on activity before their noticing skills produce scientific observations. Preferably it is useful to have the stem still attached.
2. **Scientific Drawing:** Each child will be making a scientific drawing of the parts of an apple either during the observation period or whole group. Scientific drawings are drawings with labels/parts/functions appropriately placed on the object. **If an apple blossom is completely pollinated there should be at least 10 seeds inside.*
3. **Class Discussion:** Engage children in a class discussion for 5-10 minutes and allow them to share ideas and experiences about the parts and functions of an apple. At the top of a piece of chart paper write "Parts of an apple" and children can be called up to draw and label parts of an apple. Children may already know a majority of the names of the parts of an apple but during this lesson the importance of observing the apple focuses on the function of the apple parts as part of the story on apple reproduction. Once an apple diagram has been drawn on the chart paper, now begin to elicit children's ideas regarding the functions of the parts of an apple. Sample questions to elicit ideas include:
What do you think the stem is for? Why do apples have skin? Why are apples that we eat taste sweet? What kinds of animals besides humans eat apples? Why do you think the seeds are in the middle? Why do you think the tree has more leaves than apples?





EXTENSION ACTIVITIES

The following activities and books allow for young learners to get excited about seeds and plants and opens up opportunities for interacting with seeds in engaging and purposeful ways. There are numerous activities that you can do at home, at a park, at the grocery store, or at schools that relate to seeds. Even something as simple as a seed hunt outdoors or in your fridge creates wonder and excitement for children to begin making connections to the food they eat with the seeds that provide that food.

Activity 1: “Dandelion Hunt” (Spring, Summer, Fall Activity)



Dandelions are considered weeds by some people but other people around the world use dandelions as medicine and food. One of the most important facts about dandelions is that they are the bee's first food in spring, which means that bees need these yellow flowers to survive until other flowers come into bloom in late spring.

Take your learners outside and ask them to find dandelions. If they have never seen one, consider looking up a photo on a phone or computer prior to going outside. Spend time looking for dandelions and perhaps count how many you see in a given area such as a backyard or playground. Dandelions are very good at spreading their seeds! Consider finding one so that the children can blow the seeds to see how they disperse in the wind. Then ask: Why do you think the seeds fly all over? What do you think will happen to that seed? What does that seed need to grow into a dandelion? What are the parts of a dandelion plant?

Connections to books in kit:

This activity connects directly to *Weeds Find a Way*, except that it allows a different perspective to be added about weeds. In focusing on the importance of the dandelion as a particularly important weed for bee survival, we allow room for people to think about weeds from an insect's perspective.



Materials:

Magnifying Glasses

*A similar type hunt can occur with wildflowers, pine cones, fir cones, maple seed helicopters, or tumbleweeds depending on the climate and region in which you live.



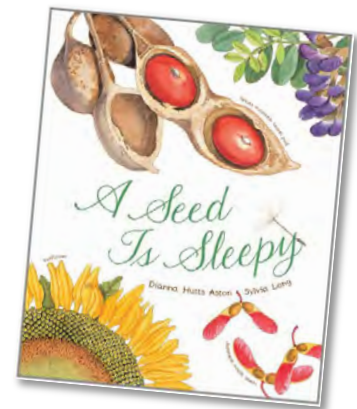
EXTENSION ACTIVITIES

Activity 2: Make a fruit salad and explore seeds

Cut up a single piece of fruit or make a fruit salad with an audience of young learners. Spend time exploring the different seeds that emerge from each fruit. Spend time in discussion about the differences and similarities between the seeds. For example apples keep their seeds in the middle of the fruit and each of these seeds has a hard seed coat to protect itself, while berries have seeds that are located closer to the outside of the fruit and without hard seed coats. Asking children to wonder about these ideas actively engages their critical thinking skills about foods they regularly eat.

Connections to books in kit:

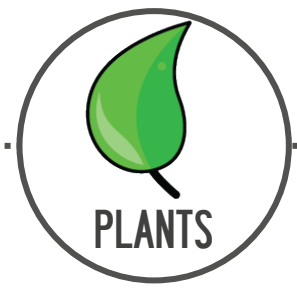
This activity connects to the book *A Seed is Sleepy* and provides an accessible hands-on sensory experience with food.



Materials:

- 1-5 different kinds of fruits (apples, pears, plums, berries, banana, mango, papaya)
- Knife
- Bowl/plate





EXTENSION ACTIVITIES

Additional Resources

Book Titles

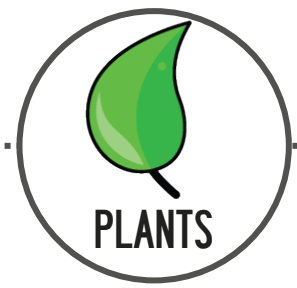
- *The Dandelion Seed* by Joseph Anthony
- *The Tiny Seed* by Eric Carle
- *The Reason for a Flower* by Ruth Heller
- *Apples* by Gail Gibbons
- *How a Seed Grows* by Helene Jordan
- *From Seed to Plant* by Gail Gibbons
- *From Seed to Plant* by Allan Fowler
- *Fruit is a Suitcase for Seeds* by Jean Richards
- *Sunflower House* by Eve Bunting

Web Resources and Links

- *The Dandelion Seed* by Joseph Anthony
<https://www.youtube.com/watch?v=N8qsCtsOHf8>
- *The Tiny Seed* by Eric Carle <https://www.youtube.com/watch?v=ls6wTeT2cKA>
- *Peep Plants a Seed* by Joe Fallon <https://www.youtube.com/watch?v=Yxs7P7LWzDg>
- <http://www.watchknowlearn.org/Video.aspx?VideoID=34452&CategoryID=9451>
- George Washington Carver
<http://www.watchknowlearn.org/Video.aspx?VideoID=35879&CategoryID=9454>
- <http://appleparermuseum.com/AppleTreeReproduction.htm>
- <http://people.oregonstate.edu/~muirp/cropdiv.htm>
- <http://news.nationalgeographic.com/news/pictures/2012/07/120702-svalbard-doomsday-seed-vault-food-supply/>
- <https://www.youtube.com/watch?v=zUkQgsMJqHY>

Sample Google and YouTube Search Terms:

plants, seeds, flowers, apples, plant books, pollination, plant seed dispersal



PLANT CARDS

Plant Cards: There are twelve sets of plant cards. Each set shows either seeds, or an adult plant.

Allow children to look at and explore the cards freely. Encourage them to tell you what they notice and wonder about the seeds and plants.

Ask open-ended questions about the cards such as:

- How do you think this seed might travel? Why do you think that?
- How far might it travel. Why do you think that?
- Where might we find this plant? What makes you think that?
- How many seeds do you think are here? How do you know?

Encourage children to put the cards in pairs or sort them into larger piles. Ask questions such as: Which cards do you think go together? Why do you think that? (children might pair a seed to an adult plant, or two cards with food on them, or make different piles to sort the cards based on color or how the seeds might travel.

*Don't worry if you don't know much about the plants. Exploring and wondering are important scientific and mathematical skills. Children can use clues from the pictures to support their ideas. (For example, children might guess that the wild carrot seeds will stick to animal fur since they have little barbs on the seeds. Or they might guess a lotus seed pod will float since it is near water)

If children seem especially interested in a specific plant, follow their lead and see what information you can find together online, at the library, or from a friend. Plant names are included with the thumbnails on this page.

PLANT CARDS

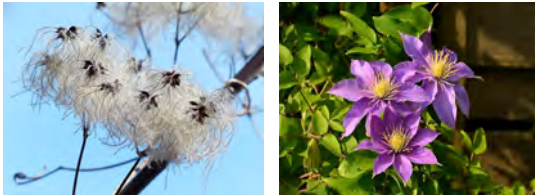
Dandelion



Sunflower



Clematis



Strawberry



Milkweed



Avocado



Burdock



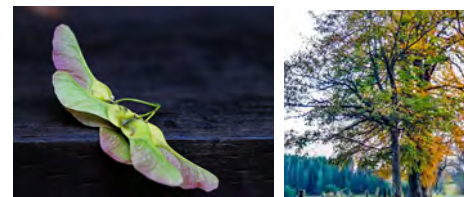
Banana



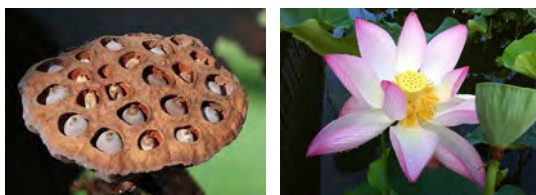
Wild Carrot



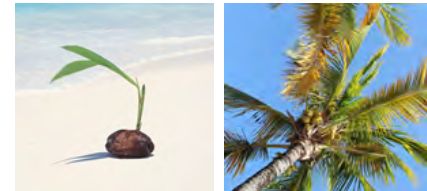
Maple

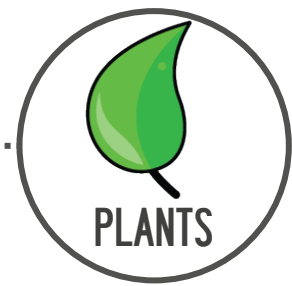


Lotus



Coconut





CONNECTIONS TO ACADEMIC STANDARDS (CCSS & NGSS)

[LITERACY STANDARDS]

Shared reading books support engagement with the following Common Core State Standards–English Language Arts (CCSS-ELA):

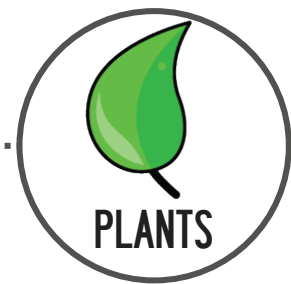
Reading Informational Text

1. Ask and answer questions about key details in a text
2. Identify the main topic and retell key details of a text
3. Describe the connection between two individuals, events, ideas, or pieces of information in a text
4. Ask and answer questions to help determine or clarify the meaning of words and phrases in a text
5. Know and use various text features (e.g., headings, tables of contents, glossaries) to locate key facts or information in a text
7. Use the illustrations and details in a text to describe its key ideas
9. Identify basic similarities in and differences between two texts on the same topic

Speaking and Listening

1. Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups
Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).
Build on others' talk in conversations by responding to the comments of others through multiple exchanges.
Ask questions to clear up any confusion about the topics and texts under discussion.
2. Ask and answer questions about key details in a text read aloud or information presented orally or through other media
4. Describe people, places, things, and events with relevant details, expressing ideas and feelings clearly
5. Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings
6. Produce complete sentences when appropriate to task and situation

[STORY TIME STEM]



[MATHEMATICS STANDARDS]

Shared reading books support engagement with the following Common Core State Standards–Mathematics (CCSS-M):

Mathematical Practices

- Make sense of problems and persevere in solving them.
- Reason abstractly and quantitatively.
- Construct viable arguments and critique the reasoning of others.
- Model with mathematics.
- Use appropriate tools strategically.
- Attend to precision.
- Look for and make use of structure.
- Look for and express regularity in repeated reasoning.

[NEXT GENERATION SCIENCE STANDARDS]

K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.

LS1.C: Organization for Matter and Energy Flow in Organisms: All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.

LS1-A: Structure and Function: All organisms have external parts. Plants also have different parts (roots, stems, leaves, water, food and air) that helps them survive and grow.

LS1-B: Growth and Development of Organisms: Plants can have young. Reproduction is essential to the continued existence of every kind of organism. Plants have unique and diverse life cycles.

LS2-A: Interdependent Relationships in Ecosystems: Plants depend on water and light to grow. Plants depend on animals for pollination or to move their seeds around.

2-LS4-1: Make observations of plants and animals to compare the diversity of life in different habitats.

LS4-D: Biodiversity and Humans: There are many different kinds of living things in any area, and they exist in different places on land and in water.

Science and Engineering Practices:

Analyze and Interpret Data: Use observations to describe patterns in the natural world in order to answer scientific questions.

Obtain, Evaluate, and Communicate Information: Obtaining, evaluating, and communicating information in K-2 builds on prior experiences and uses observations and texts to communicate new information. Read grade appropriate texts and use media to obtain scientific information to determine patterns in the natural world.