

[ELEMENTS OF STORY TIME STEM]

Books are an opportunity to explore ideas, concepts, and themes found in everyday events.

1

Children see math, science, and literacy in their everyday lives. When we teach children to see the math, science, and literacy in picture books, we support their understanding of how these processes and events occur. Reading books multiple times is important for exploring different aspects of a story and deepening understanding.

Children are natural scientists, mathematicians, and observers:

2

Children ask questions about the world and are naturally curious about the events, objects, and living organisms around them. Using books allows us to explore math and science ideas through discussion.

Children bring valuable ideas to discussions.

3

Children are capable of the majority of the discussion talk and ideas. Use children's everyday ideas and experiences during discussions to explore science, math, and literacy topics and questions. Here, educators take on the role of guide and facilitator.

Open-ended questions support and engage children in productive discussions.

4

Use open-ended questions and activities to engage children in discussion about their emerging ideas as they explore math, science, and literacy.

Learning is a process - understanding is something that occurs over time.

5

Just as it is important for young learners to explore the joy of reading before they are able to read, it is important they explore the joy and wonder of math and science even without complete understanding of a concept. This is also true for adults!

All adults are capable of teaching.

6

All adults are teachers whom children can learn from. Use these books and materials as an opportunity to become inspired by picture books to engage with children in math, science, and literacy concepts. Anyone can use stories to have meaningful, exciting discussion that support children's learning.

Guiding Questions

Questions as Refrain



Science

- What do you observe in this (page, picture book)?
- What science ideas do you observe in this book? What do these ideas make you think about?
- What is happening in the science story that we know is there but can't see?



Math

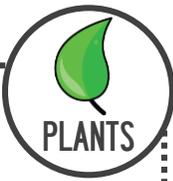
- What do you see, notice, or wonder about?
- What (numbers, combinations, patterns, shapes, other math concept) do you see?
- How might you use the illustrations to show your thinking?



Literacy

- What do you think will happen in this story, and why do you think so?
- What will happen next? How do you know?
- What connections can you make between this story and another story or something else you know?

[STORY TIME STEM]



Integrated Bookmark Guide

A SEED IS SLEEPY

The pictures of the different plants offer opportunities to notice and compare relative sizes and quantities of objects, such as how many seeds grow together on different plants. Many are in sets of two, and others have hundreds of seeds grouped together. During a first read it is useful just to notice this. In future reads, young mathematicians can explore counting in different sized groups (see the math/science focused guide).

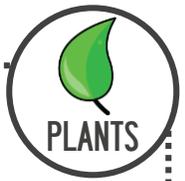
Introducing the book:

- **Looking at cover:** This book is called *A Seed is Sleepy*. What do you notice about the illustration on the cover? What might this book be about? (Prediction)
- **Science/Math:** Can you think about a time when you saw or picked up a seed?

Exploring the book:

- Pages 8-11 ("A seed is sleepy.")
 - **Science:** With your body can you show how a sunflower seed is tucked safe inside their seed coat? Why do you think some seeds are found inside of a pod?
 - **Math:** What do you notice about how many seeds are in the Sunflower compared to the seeds of the Texas mountain laurel? (children may notice size, quantity or how often the seeds germinate- all of which are good ideas to think about!)
 - **Literacy:** What makes a seed sleepy? What makes a seed secretive?

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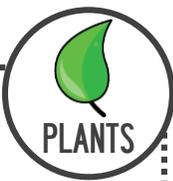


- Pages 12-19 ("A seed is fruitful.")
 - **Science:** Can you point to some of the seeds in these pictures that you think are interesting? **Can you find two seeds that look similar or that look different?**
 - **Math:** **What do you notice about the different kinds of seeds on the last few pages?** (quantity of seeds grouped together, or how far they travel are both beautiful beginnings of math and science conversations.)
 - **Literacy:** **What makes a seed adventurous?** What makes a seed naked? What makes a seed fruitful?
- Pages 22-27 ("A seed is inventive.")
 - **Science:** **What do you think that seeds need in order to grow into plants?**
 - **Math:** (p. 24, "A seed is generous.") **What do you notice about how these seeds grow into plants?**
 - **Literacy:** **What makes a seed ancient?** What makes a seed generous? What makes a seed inventive?
- Pages 28-35 ("A seed is thirsty.")
 - **Science:** Do you ever get hungry and thirsty? **What do you think seeds drink?**
 - **Math:** **What do you notice about how tall the plants are in different stages?**
 - **Literacy:** **What makes a seed awake?** What makes a seed clever? What makes a seed hungry and thirsty?
- Page 36-37 and pages 4-5 (collections toward the front and back of the book)
 - **Math/Science:** **How do these seeds compare?** (seeds to plants)

Extending through discussion:

- **Science:** Bring different kinds of seeds (apple, orange, peas) to the discussion and ask questions related to size, texture, and color.
- **Math:** What did you notice about the different kinds of seeds in this book? (size, shape, quantity of seeds in cluster all are great topics for math discussion) What did you notice about the ways that seeds find a place to grow?

[STORY TIME STEM]



Math/Science Bookmark Guide

A SEED IS SLEEPY

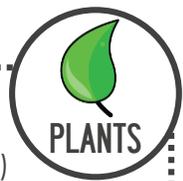
Science: Young learners can practice their observation skills through the images in this book. Pointing out or asking children to notice particular patterns with seed colors, pods, sizes, and quantities allows them to use observations to describe patterns in the natural world.

Math: The different sizes and shapes of the seeds as well as the quantities of seeds that each plant produces are all wonderful topics for mathematical conversations. (Ex. one seed might weigh as much as 1,000 of another type of seed, or take up a different amount of space). Seeds also offer a natural way to explore numbers that are much bigger than those generally offered in most picture books.

Exploring the book:

- Pages 4-5 (seed collection)
 - **Math/Science:** (Ask children to describe what they see.) **What do you see? How many kinds of seeds do you see? Have you ever seen a seed like this outdoors?**
- Pages 12-13 ("A seed is fruitful.")
 - **Science:** Look at the pictures, **do you see any fruits that you have tasted? Can you find the seeds on the strawberry? Can you find the blueberry? Where do you think that the blueberry seed is hidden?**
- Pages 14-15 ("A seed is naked.")
 - **Math:** Let's look closely at this picture. **What do you notice? What might these numbers be here for?** Let's count by 50 like they do on this page.
 - **Science:** Have you ever picked up a pine cone or a fir cone? What did it feel like? **Do you think that pine cones or fir cones have seeds inside?** How many seeds do you think that these cones have?
- Pages 16-17 ("Seeds come in many sizes.")
 - **Math/Science:** **What do you notice about these two different seeds?** Show with your hands how big an orchid seed is, how big a coco de mer palm seed is. **What might happen if a million coco de mer palm seeds were on a tree all at once?**

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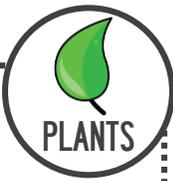


- Pages 22-23 ("A seed is inventive.")
 - **Science:** Can you point to the bear in this picture? **What is one food that bears like to eat?** Many bears like to eat berries and when the berries pass through the bear's tummy and out the other end, **what do you think happens to those seeds?**
- Pages 24-25 ("A seed is generous.")
 - **Science:** (Consider covering up all the rows of images except for one so that students can focus on the growth of one particular seed.) **What do you notice about how this plant grows?** (Another idea is to ask students to compare two or more plants.) **How are these plants alike? How are they different?** Can you point to the seeds that grow into having green leaves? Which seeds will grow into big plants and which seeds will grow into smaller plants?
 - **Math:** (Try looking at all of the plants together on the page.) **What do you notice about how these plants grow?** Children might notice the different types of plants, different growth times, or the lack of overall scale on the page (as compared with p.15). Follow up with open-ended questions to draw out children's own ideas. **What makes you think that? Why do you think the illustrator drew it that way?**
- Page 34-35 ("awake!")
 - **Math/Science:** **What do you notice about these sunflowers?** What colors do you see? What shapes do you see? Have you ever seen a sunflower at the store or in a garden? (Try encouraging children to notice different parts of the flowers and to estimate quantities that are in the pictures.) **"How many ___ do you see? Can you count them? How can you keep track of what you are counting?"**

Exploring and extending the thinking:

- **Math:** Continue to explore larger quantities like those presented in this book. Younger children benefit from noticing where large quantities occur in the world, and can begin to count larger numbers. Older children may be ready to count in larger quantities (1000, 2000, 3000, or 25, 50, 75, 100) or to estimate large quantities.
- **Science:** Consider going outside for a seed hunting mini-field trip, gather a few different kinds of seeds and spend time talking about their different colors, sizes, shapes, and seed coats.

[STORY TIME STEM]



Literacy
Bookmark Guide

A SEED IS SLEEPY

This book explores the world of seeds, and it uses interesting words to describe seeds and the kinds of things seeds do. Let's read the book again and pay special attention to these words.

Exploring the book:

- Pages 8-9
 - **How is a seed sleepy? How are you sleepy?**
- Pages 10-11
 - **How is a seed secretive? How are you secretive?**
- Pages 14-15
 - **How is a seed naked? How are you naked?**
- Pages 18-19
 - **How is a seed adventurous? How are you adventurous?**
- Pages 22-23
 - **How is a seed inventive? How are you inventive?**
- Pages 24-25
 - **How is a seed generous? How are you generous?**
- Pages 28-29
 - **How is a seed thirsty and hungry? How are you thirsty and hungry?**
- Pages 30-31
 - **How is a seed clever? How are you clever?**

[STORY TIME STEM]



Exploring and extending the thinking:

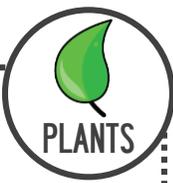
Talk about ways PEOPLE are described using the words from the book that describe seeds; have children draw/write about one of these words in their own lives:

- Sleepy
- Secretive
- Fruitful
- Naked
- Adventurous
- Inventive
- Generous
- Ancient
- Thirsty
- Hungry
- Clever
- Awake

There are also words that scientists use when they study and learn more about plants. Revisit the science words in the book; choose one to explore further with resource materials and have children draw a diagram, with labels. Science words:

- Gymnosperm (p. 15)
- Embryo (p. 24)
- Cotyledon (p. 25)
- Monocot (p. 25)
- Dicot (p. 25)
- Germinate (p. 27)
- Photosynthesis (p. 30)
- Carbon Dioxide (p. 30)

[STORY TIME STEM]



Integrated Bookmark Guide

FLIP, FLOAT, FLY

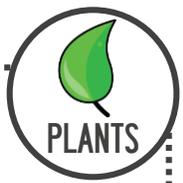
Introducing the book:

- **Looking at cover:** This book is called *Flip, Float, Fly*. What do you notice about the illustration on the cover? What might this book be about? (Prediction)
- **Science/Math:** What is the person in the picture doing? Have you ever done that?

Exploring the book:

- Pages 4-5 ("Maple seeds whirl...")
 - **Literacy:** What do you notice on this page? "Away they fly like shiny green helicopters, spinning and spinning." What does that mean? What does that make you think about?
 - **Science:** Have you ever seen these kinds of Maple seeds? **It says that they fly like helicopters, can you stand up and show us with your body how this seed might fly?**
 - **Science/Math:** How does the shape of this seed pod help to spread the seeds? (travel) How are the seeds similar to the birds and helicopter?
- Pages 10-11 ("Locust tree pods...")
 - **Science/Math:** How does the shape of this seed pod help to spread the seeds?
 - **Literacy:** What do you notice on this page? "Locust tree pods look like long brown smiles." What does that mean? What does that make you think about?
- Pages 14-15 ("The air inside a coconut...")
 - **Science:** Look at the picture of the inside of the coconut. **Why do you think that coconuts need such a strong, thick outer seed coat?**

[STORY TIME STEM]



- Pages 18-19 ("A wild oat seed...")
 - **Science/Math:** What do you notice about the wild oat seeds? How does the shape or size help the seed to spread to new places? **How does this compare with the coconut and touch-me-not seeds?**
 - **Literacy:** What do you notice on this page? "A wild oat seed curls up in the sun like a comma." What does that mean? What does that make you think about?
- Page 25 ("Burdock seeds...") (reflecting on this and previous pages)
 - **Science/Literacy:** What are some ways seeds move around? What do you notice?
 - **Science:** Why do you think the seeds need to move around in different ways?

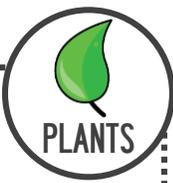
Extending through discussion:

- **Science:** Some main science ideas in this book are: 1. Understanding different ways that seeds travel and why seeds need space to grow. 2. Thinking about why it is important for seeds to travel.

Seeds are well adapted to survival and this book shows the different ways that seeds travel. During a discussion consider spending time thinking about how each seed's design supports its ability to flip, float, and fly. Consider taking a walk outside to find different kinds of seeds and spend time talking about their design and where these seeds originated.

- **Math:** Think about the seeds we read about in this book and how they each travel. How far do you think each type of seed travels? What makes you think that?
- **Literacy:** What is something you learned about seeds? What was your favorite part of this book? What is a seed you know about, and what is it like? (analogy)

[STORY TIME STEM]



Math/Science Bookmark Guide

FLIP, FLOAT, FLY

Science: Seeds travel and have stories about their journeys, just like people. As you read this book encourage children to make personal connections to the illustrations and listen to the stories they share about seeds.

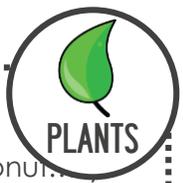
Math: The illustrations in this story provide many opportunities for young mathematicians to count to tell how many and see items in groups. On Page 1, for example, invite children to count the maple seeds, "How many maple seeds do you see? Show us your thinking using the picture!" (Children might point to one item at a time counting "1,2,3,4,5." They might count by 2s or start with a different seed than other readers.)

Exploring the book:

This book explores different ways that seeds move around. As we read this book, let's keep track of how many different ways seeds move around in this book.

- Pages 2-3 ("Take a breath and blow...")
 - Science:** **Have you ever blown dandelion seeds?** Did the seeds travel far or stay close together?
- Pages 6-7 ("Tumbleweed plants...")
 - Math:** Look at these tumbleweed plants! How many do you see? **Where are the seeds? Are there more seeds or more tumbleweed plants?** How do you know?
 - Science:** Have you ever seen a tumbleweed plant? They only grow in certain areas of America. Tumbleweeds were accidentally brought to this country by Russian immigrants. They brought wheat seeds on their immigration journeys but they didn't know that tumbleweed seeds got mixed up with the wheat seeds. Seeds can be sneaky! **Can you think of other ways that seeds are sneaky?**
- Pages 12-13 ("Where water flows...")
 - Math:** The author used a lot of words that begin with S on this page. **How many are there? Which line has the most s-words?** (There are a lot of words beginning with S throughout the book!)

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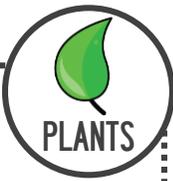


- Pages 14-15 ("The air inside a coconut...")
 - Science:** How does this seed travel by water? **How might other seeds travel by water?**
 - Math/Science:** How does the size of a coconut compare with other seeds? It says that the coconut drifts away on the ocean. **Does the coconut seed coat look strong and thick or thin and weak? Why would that be important?**
- Pages 18-19 ("A wild oat seed...")
 - Math/Science:** There are several flying creatures on this page. What kinds of animals and insects do you see? **How many little wings do you think they have altogether? How would you count them?** (similar questions can be asked about the number of mice, tails, feet, etc.)
- Pages 24-25 ("Burdock seeds stick...")
 - Math/Science:** What do you notice about the seeds on this page? **How are they moving to different locations?** (Compare this method to the previous 4 pages where animals moved seeds in different ways.)
- Pages 26-27 ("People buy seeds...")
 - Math/Science:** **How many different parts of the plants do you notice?**

Exploring and extending the thinking:

- Math:** When counting out quantities in the book, it is helpful to write down the numbers and number sentences that children say. For example, $1 + 1 + 4 = 6$ might show the quantity of different "s-words" in the lines of text on page 13. Children might count in various ways on pages 18-19 with one child counting the four-winged creatures first, followed by the two-winged creatures $4 + 4 + 4 + 2 + 2 = 16$ while another student might count from left to right $2 + 4 + 4 + 4 + 2 = 16$ or a child might even count by 2s $2, 4, 6, 8, 10, 12, 14, 16$. Some older children might be ready to think about equal groups representing 3 four-winged creatures and 2 two-winged creatures $(3 \times 4) + (2 \times 2) = 16$. You can try this with other items children count.
- Science:** Consider taking a seed walk in the grocery/nursery store or in your kitchen or garden. Ask young children where the seeds are located in the food or plant. Ask students to draw a picture of what they think the seed looks like inside the food or plant. Then if you are able to open the food or remove a seed, spend time adding details to the picture about seeds.

[STORY TIME STEM]



Literacy
Bookmark Guide

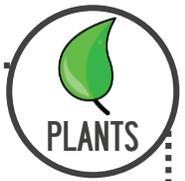
FLIP, FLOAT, FLY

This book describes seeds and compares them to other things. This is called an analogy. Let's see what kinds of things the author compares seeds to. How are these things the same? How are they different?

Exploring the book:

- Pages 2-3 ("Take a breath and blow...")
 - **What do you notice about dandelion seeds? What are they like?**
- Pages 4-5 ("Maple seeds whirl...")
 - **What do you notice about maple seeds? What are they like?**
- Pages 6-7 ("Tumbleweed plants...")
 - **What do you notice about tumbleweed plants? What are they like?**
- Pages 8-9 ("Basswood tree fruit...")
 - **What do you notice about basswood tree fruit clusters? What are they like?**
- Pages 10-11 ("Locust tree pods...")
 - **What do you notice about locust tree pods? What are they like?**
- Pages 18-19 ("A wild oat seed...")
 - **What do you notice about wild oat seeds? What are they like?**

[STORY TIME STEM]



Exploring and extending the thinking:

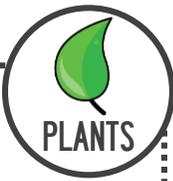
What are some of the things seeds were compared to? What other seeds can we think of, and what are they like? (apple and watermelon are good examples).

Seed Analogies:

- **Dandelion seeds:** small soft feathers
- **Maple seeds:** shiny green helicopters
- **Tumbleweed plants:** round as globes
- **Basswood tree fruit clusters:** sailboats
- **Locust tree pods:** long brown smiles
- **Wild oat seed:** curls up like a comma

Think about a seed you know. **What is it like? What can we compare it to?** Draw what you are thinking about (the analogy) and write something about it.

[STORY TIME STEM]



Integrated Bookmark Guide

LIVING SUNLIGHT

Introducing the book:

- **Looking at cover:** This book is called *Living Sunlight: How Plants Bring the Earth to Life*. **What do you notice about the illustration on the cover? What might this book be about?** (Prediction)
- **Science/Math:** **Do you think plants are important to animals? To people?** Have you ever seen a plant?

Exploring the book:

You might like to read this book section by section in different sittings. The illustrations play an important part in discussion, think about how to make them larger or more visible (doc camera?) Ask questions after reading the listed pages.

Section 1 "Energy" pages 3-10

- Page 4: ("Listen to me.")
 - **Literacy:** **Who is telling this story?** (this story is told by the sun) Let's listen to the story that the sun is telling us.
- Pages 7-8 ("I warm your land...")
 - **Literacy:** **What are some of the things the sun's energy does?** (listen for the word glacier) **What else do you think the sun's energy does?**
- Pages 9-10 ("My light becomes...")
 - **Science:** **Use your finger to trace where the light energy goes.** (Spend time on this illustration and allow children to notice the different plants and animals that use the light energy). **How do living things use the energy from the sun? What do you think?**

Section 2 "Plants" pages 11-16

- Page 12 ("Your secret starts...")
 - **Science:** Invite children to act out the actions (plants sucking up water with their feet, hands catching the light energy, hands breaking apart the water, hands catching the little packets)
 - **Literacy:** **What are the illustrations showing?** (the goal is to match the actions with the picture boxes)
- Pages 13-14 ("Meanwhile...")
 - **Science:** **What are the plants doing?** (Have children act out this process.)

[STORY TIME STEM]



- Page 15-16 ("...sugar!")
 - **Science/Literacy:** **What are some fruits and vegetables that you recognize?** Do you think that these plants and trees need the sun's energy to grow? How do you know?
 - **Math:** **Which tree do you think has the most fruit on it? Why do you think that?**

Section 3 "Food" pages 17-20

- Page 18 ("So...how do YOU get my energy?")
 - **Science:** **How do you think people and animals get the sun's energy?** (Prediction)
- Page 19-20 ("Yes, you eat plants.")
 - **Literacy:** **What do you notice? What are the people and animals doing?** What are some things you eat that have the sun's energy inside of them? Which things could you eat on these pages?
 - **Math:** **How many _____ do you see?** (I can eat pumpkin! How many pumpkins do you see?)

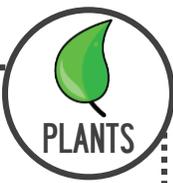
Section 4 "Oxygen" pages 21-29

- Page 21-22 ("And plants do even more...")
 - **Literacy/Science:** **Where does oxygen come from? What is oxygen used for?**
- Pages 25-26 ("Now breathe out.")
 - **Literacy/Science:** **What is happening in the illustration? What are the animals doing?** Let's act that out – breathing in, breathing out. Let's add some words to that, breathing in OXYGEN, breathing out CARBON DIOXIDE! **Which animals can you see breathing out carbon dioxide?**
- Pages 27-28 ("So you see?")
 - **Literacy/Science:** **What are some ways that plants and animals share life and energy?**
 - **Math:** **What living things do you see? How many _____ do you see? Show me how you see them.** (children might count by 1s or 2s or talk about how they added groups together)

Exploring and extending the thinking:

- **Science/Math:** Go outside to look at plants. Make observations about the way that the leaves are organized on trees, shrubs, and flowers. It is no mistake that they are evenly spaced, each leaf needs enough sunlight to generate energy through photosynthesis. Consider going on a leaf hunt to look at the different textures, sizes, shapes, and colors of the leaves in your neighborhood.

[STORY TIME STEM]



Math/Science Bookmark Guide

LIVING SUNLIGHT

Introducing the book:

This book couples vivid illustrations with rich informational text. You may consider reading this book in sections because of the number of pages. You may also pre-read the text and focus on using the illustrations to tell the story in your own words with young readers.

Exploring the book:

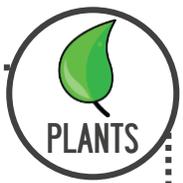
Section 1 "Energy" pages 3-10

- Pages 5-6 ("I am your sun...")
 - Science: What is energy?** (You might think about light, chemical, or mechanical energy.) **Can you share an example of energy?** On the next few pages, we are going to see the sun's light energy moving in the pictures – **Where do you see the sun's light energy in this picture?** (the little yellow dots) Let's notice where we see the sun's energy as we keep reading.
 - Math: How does the size of the sun compare with the size of the Earth in this picture?**

Section 2 "Plants" pages 11-16

- Pages 11-12 ("Your secret starts in plants...")
 - Math: What do you notice about the roots in this picture compared to the part of the plants that are above ground?** (children might notice the thickness, overall length, or the quantity of sections)
 - Science: Invite children to first look at the page with the plants and roots. Ask children to share observations- What do you see in this picture? What are the yellow dots suppose to be? What do you think the blue inside the roots is?** There are boxes that zoom into the plant. **Can you look at one box and think about how you would tell someone what is happening? Who wants to share their ideas?**
- Pages 15-16 ("...sugar!")
 - Math: Let's count the trees in this picture. Which tree do you think has the most fruit growing on it?**
 - Science: What kinds of things do these plants build with the sugar?** (leaves, stems, juices, seeds, fruits, flowers).

[STORY TIME STEM]



Section 3 "Food" pages 17-20

- Pages 19-20 ("Yes, you eat plants.")
 - Math: Do you think the insect or the man can eat more bananas?** (lower right hand portion of picture) **Why do you think that? If the man ate one banana every day, how long would the bunch last? What if he ate 2 every day? How do you know?**
 - Science: Where do people get their energy every day?** (eating, sleeping)
 - Science: Do you eat plants? What are some plants you eat?** (encourage children to think of the different parts and ways that we eat plants—lettuce (leaves), beans (seeds), wheat (processed), potatoes (roots))

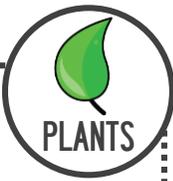
Section 4 "Oxygen" pages 21-29

- Page 24 ("Without plants...") Read pages slowly to emphasize "Without plants"
 - Science: What would the world be like without plants?**
- Page 25-26 ("Now breathe out.")
 - Math/Science: Which creatures can you see breathing out carbon dioxide?** How many animals do you see breathing?
 - Math: What do you notice about the roots of these plants compared with the part of the plant that is growing above the ground?**

Extending through discussion:

- Math: This book offers rich opportunities for comparing. The length and width and height of the plants to one another as well as 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. Are there tens, hundreds, or thousands of leaves on this plant? How might we make a good guess?**
- Science: What do the living things on these pages need to survive? Which page showed your favorite science ideas?**

[STORY TIME STEM]



Literacy Bookmark Guide

LIVING SUNLIGHT

Exploring the book: This book has complex ideas and works well with “close reading” (where you focus on a small section and carefully examine the words and ideas in that section). There are many short sections of the book that work well for close reading. Here are a few examples:

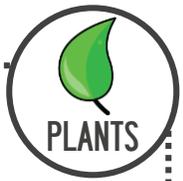
Section 1 “Energy” pages 3-10

- Page 4 (“Listen to me.”)
 - **What does it mean, “That is my light, alive inside you?”**
- Pages 5-6 (“I am your sun...”)
 - Who is telling this story? What kinds of things does the sun do? **What does it mean, “...some tiny, tiny part of my light falls on your small planet Earth.”?**
- Pages 7-8 (“I warm your land...”)
 - **What kinds of things does the sun do to affect the Earth?** What else does the sun do?
- Page 9 (“My light becomes...”)
 - **What does it mean, “All living things, including you, pulse with my light and keep it circling round and round on Earth”?**

Section 2 “Plants” pages 11-12

- **How do plants use the sun’s energy?**
- “In daylight, green plants catch my energy with their chlorophyll.” **What does this mean? How do the illustrations help explain this?**
- “Plants use my energy to break apart the water--break the H₂O into H and O₂, hydrogen and oxygen.” **How might you explain this in your own words? How do the illustrations help explain this?**
- “But as plants break apart the water, they trap my energy as little packets.” **What does this mean? How do the illustrations help explain this?** What do you think the plants do with these little packets of energy?

[STORY TIME STEM]



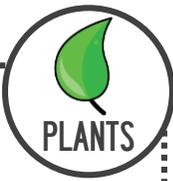
Section 3 “Food” pages 17-20

- **How do you think the energy from the sun gets to us and other creatures?** (Prediction)
- Pages 17-18 (“But wait!”)
 - How are we and other living creatures like reptiles and birds different from plants? **“You cannot catch my light.” What does this mean?**
 - **How do you think humans and other living creatures like birds, insects, and fish get the sun’s energy?** (Prediction)
- Pages 19-20 (“Yes, you eat plants.”)
 - **How do we get the sun’s energy?** How does this compare to your prediction? **What are the animals and people doing in the illustration on these pages?** What do you notice?

Exploring and extending the thinking:

For the example “close reading” sections above (or for another selection from the book) focus on having children explore ideas from the illustrations and text in their own words. Children might draw their own diagram/illustration showing a concept from one of the selections. They might also use their own words to add labels.

[STORY TIME STEM]



Integrated Bookmark Guide

WEEDS FIND A WAY

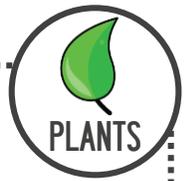
Introducing the book:

- **Looking at cover:** This book is called *Weeds Find a Way*. What do you notice about the illustration on the cover? What might this book be about? (Prediction)
- **Science/Math:** Weeds are very effective at survival and reproduction because of their large number of seeds coming from each plant and the way that they are widely distributed by the wind, animals, and water. The illustrations in this book allow opportunities to think about large numbers that are often difficult to count. Younger children can consider places in the world where quantities are very large, and older children might explore estimation and counting by larger quantities (by 25s or 100s, for example)

Exploring the book:

- Pages 2-3 ("Weeds find a way...")
 - **Science:** What is a weed? Can you share your ideas about weeds?
 - **Math:** What do you know about one thousand? Where can we find thousands of something? (seeds, dog hair, p.6 blades of grass, dandelion hairs, girl's hairs)
 - **Literacy:** Where do you think the weed seeds are going? What will happen?
- Pages 8-9 ("or shot out of...")
 - **Science:** Why do you think that these seeds were hiding/waiting in these brown pods?
 - **Math:** How many silky hairs do you think are attached to each milkweed seed? (Try different counts with different student suggestions ex. 100,200,300 or 50,100,150,200)
- Page 15 ("carrying them, floating...")
 - **Literacy:** "Downstream to sprout..." Where did the weed seeds go? How does this compare to your prediction? What will happen next?

[STORY TIME STEM]



- Pages 18-19 ("Weeds find a way to grow...")
 - **Science:** What do you think it means when they say that weeds find a way to grow?
 - **Literacy:** Where are the weeds growing? Where have you seen weeds growing?
- Pages 24-25 ("Weeds find a way to fight...")
 - **Science:** Have you ever been pricked by a thorny weed? Why do you think some weeds have thorns?
 - **Math:** Where do you see groups on this page? (caterpillar dots and stripes, spines on the green Nodding Thistle leaves) Try counting with children or just noticing that the groups are there.
 - **Science/Literacy:** What kinds of things are weeds fighting, and why?
- Pages 30-31 ("the whole family along!")
 - **Science/Math:** Wow! There are so many weeds to count on this page! How might you think about counting them that will make it easier to count?
 - **Science/Literacy:** What does it mean that weeds "take the whole family along?" How do weeds find a way?

Extending through discussion:

- **Science:** Have you ever seen weeds growing out of the cracks of the sidewalk or a trees roots break up part of the sidewalk? Do you think weeds are strong?
- **Literacy:** Prediction and retelling: What did you think would happen in this book, and how did your prediction compare to what you learned? What surprised you? What was your favorite part? What is the journey weeds and their seeds go on, and what are some of their challenges? Where have you seen weeds? What did you notice? What were they like?

[STORY TIME STEM]



Math/Science Bookmark Guide

WEEDS FIND A WAY

Math: Although this book is not explicitly mathematical, the way the seeds spread and the weeds persist, can be likened to the way **mathematician's ideas spread and they way mathematicians persevere in solving problems.**

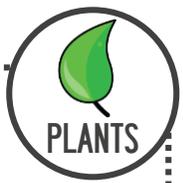
You could read this story with a mathematical lens in two different ways. One way would be to think of the seeds and weeds through the mathematical ideas and problem solving analogy described above. Another way could be to invite children to count and notice things on the pages.

Science: This books supports students in thinking about weeds in a new way. **Weeds are all around us in our everyday life**, no matter whether we live in the city and see sprouting weeds through sidewalk cracks or live in the country and see fields of wild plants. Weeds are very good at reproducing and it is important to think of weeds as **resilient and strong plants.**

Exploring the book:

- Pages 2-3 ("Weeds find a way...")
 - **Science:** **What do you think is a weed? Have you ever seen a weed?**
- Pages 4-5 ("Weeds send their seeds...")
 - **Math:** I'd like to invite us to think about the seeds in this story as the seeds of ideas! Think of a time when you sent your ideas into the world. **What was an idea that you had that you shared with others?**
 - **Science:** Have you ever planted seeds? **Do you think that weeds need help getting their seeds planted by people?**
- Pages 6-7 ("swirled into prickly burrs...")
 - **Science:** Have you ever had pieces of plants stuck to your clothes when you walked through tall grass? **Why do you think it helps the weeds if they can spread their sticky seeds all around?**

[STORY TIME STEM]

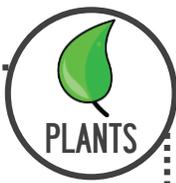


- Pages 10-11 ("Weeds find a way to wait...")
 - **Math:** Have you ever had to use some wait time to think about someone else's idea OR **while someone thought about your idea?**
- Page 15 ("carrying them, floating")
 - **Math:** Have you ever had someone take up your idea and carry it forward? OR **have you thought about someone else's idea and carried it forward?**
 - **Science:** **What does it mean if a seed sprouts?** Can you show me with your body?
- Pages 18-19 ("Weeds find a way to grow...")
 - **Math:** Just like weeds find a way to grow, our math ideas find ways to grow. **When was a time when you had an idea that grew into a different idea?**
 - **Science:** **Have you ever gone on a weed hunt walk to see all the different places that plants can grow?**
- Page 22 ("Weeds find a way to stay...")
 - **Math:** Just as weeds find a way to grow, stay, fight, and be loved, mathematicians ideas grow, and stick, and persist, and take hold. **Think of a time when you had to really stick with an idea in order to solve a problem.**
 - **Science:** Do you think weeds are beautiful? Do you think weeds are strong? **What is something new you learned about weeds?** Allow time for discussion and revisiting pages in the book as needed to support students in articulating their ideas.

Exploring and extending the thinking:

- **Math:** Mathematicians are people who persevere in solving problems, just like the ways the weeds in this story grow and fight. **Think of a time when you really had to fight to solve a problem, draw a picture and/or write a description of the problem you were solving and what helped you to stick with it!**

[STORY TIME STEM]



Literacy Bookmark Guide

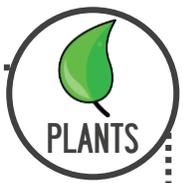
WEEDS FIND A WAY

This book is about the exciting journey weeds and their seeds undertake to start new lives in new places. The story is told using wonderful words that describe this adventure. Many of these words have the same first letter or beginning sound! (Alliteration) **Some of the words sound the same at the end--rhyming words! Let's read the book to explore some of these wonderful words!**

Exploring the book:

- Pages 4-5 ("Weeds send...")
 - **What do you notice about the words on this page?** Rhyme: "Weeds send their seeds" Alliteration: "Weeds send their seeds into the World in Wondrous Ways" "Fluffing up like Feathers and Floating away on the wind"
- Pages 6-7 ("swirled into prickly...")
 - **What do you notice about the words on this page?** Alliteration: "...that Stick to Socks and fur, Poking into Pants and Paws like tiny needles"
- Pages 12-13 ("or baking in shimmering...")
 - **What do you notice about the words on this page?** Alliteration: "or baking in a Shimmering Summer heat on a White-hot Sidewalk Without a Whisper of Wind"
- Pages 20-21 ("in a tangle of...")
 - **What do you notice about the words on these pages?** Alliteration: "in a Tangle of Tree roots at the Top of a Spine of Stone, or Wedged in the Worn sole of a tattered sneaker"

[STORY TIME STEM]



- Page 23 ("or pinching into pieces...")
 - **What do you notice about the words on these pages?**
Alliteration: "or Pinching into Pieces the minute you Try to Tug them out, Spreading into a Spray of Plant Parts..."

Exploring and extending the thinking:

Let's think about the adventure and challenges of weeds and their seeds. What was your favorite part? What do you know about weeds?

What words with the same beginning or ending sounds did the author use to describe the journey of weeds and their seeds?

- Fluffing, feathers, floating
- Swirled, stick, socks
- Poking, pants, paws
- Weed, way, wait, winter
- Sitting, still
- Shimmering, summer, sidewalk
- White-hot, without, whisper, wind
- Crack, cellar, creaky
- Tangle, tree, top
- Spine, stone
- Wedged, worn
- Pinching, pieces
- Try, tug
- Spreading, spray
- Plant, parts
- Riotous, red
- Bees, birds
- Sweet, sleep
- What words with the same beginning or ending sounds would YOU use to talk, draw, and write about weeds?