Welcome!

If you want to play along with us today, grab these supplies:

- ½ cup Vinegar
- Coffee filter
- A tall, clear cup or jar
- Black marker and green marker (Washable-not permanent!)

seasonalscience

Before we get started

- **Professional Development Certificate**
  - Will be sent via email in a few days following this presentation

- **Questions**
  - This is being presented in a webinar format and we are a large group today, but you can ask questions during the presentation and we will do our best to answer them.
  - Use the ***Q & A option*** on the bottom of your screen to post a question and our team will be answering them throughout.
- **Polls**
  - There will be several polls we'd like you answer throughout the webinar so we can get to know you and what you would like to see from other programs in the future.

- **Recording**
  - A **recording** of this presentation will be made available to you after the webinar, as well as access to **step-by-step instructions** for the activities highlighted today, a **book recommendation** and a **resource list**. The recording will also be available to view on Becker's You Tube page.

About Me

- Certified K-8 Teacher
- 15 years as a science educator at The Academy of Natural Sciences in Philadelphia, PA
- Reading Specialist with Achieve Now, a Philadelphia nonprofit providing literacy support for public school children grades K-3

Poll

How comfortable are you teaching science in your classroom?

Standards Alignment

- Children have a natural desire to explore, to build, and to question. Through open-ended exploration, children interact with materials in nature and scientific materials/tools to explore and learn about their world. (ECERS-3)
- Children have an innate desire to experiment and investigate while gathering data to make conclusions. (PA Early Learning Standards)
- Adults facilitate children's development of those skills that support discovery and inquiry while promoting their natural curiosity.
- Children first construct scientific knowledge by using their five senses to interact with the environment. That is how they make sense of their world. (Head Start)
- Children's immediate environment and daily surroundings provide the best context for science learning. Some ways they do this include observing, measuring, investigating, sorting, and comparing. (PA Early Learning Standards)
- Adults scaffold children's thinking by asking open-ended questions that encourage problem-solving and critical thinking. (PA Early Learning Standards)
- Young children's inclination to be curious, explore, experiment, ask questions, and develop their own theories about the world makes science an important domain for enhancing learning. (Head Start)

Science for Littles

In preschool, science is more about practicing skills and fostering a love of science than content

- **Making Observations** is the #1 skill to practice in early education
- **Asking Questions** is #2!
- Other skills that can be fostered through science instruction in the ECE classroom:
  - **Cause and Effect**
  - **Following Directions**
  - **Order of Operations**
  - **Background Knowledge Acquisition**

Hands on Science: Dissections

Poll

Have you dissected *(cut open or pulled apart and looked inside*) any fruit, vegetables, plants, flowers, seeds or dirt in your classroom?

Hands on Science: Dissections

Dissections are a great way to:

- **Practice using all of the senses to make observations**
  - Don’t be afraid to get in there and get messy!
  - When you squish, make sure to sniff and listen

- **Practice using tools**
  - Tweezers
  - Toothpicks/Popsicle Sticks
  - Spatulas
  - Scales/rulers/measuring cups and spoons
  - Eye droppers
  - Magnifying Glasses
  - Journals/Science Notebooks

- **Practice predictions**
  - Make predictions at all stages of the dissection
  - Don’t forget to go back after the dissections to your predictions.

- **Make comparisons, sort, and arrange**

Hands on Science: Dissections

Fall Dissections:

- Apples
- Pumpkins and squash
- Root vegetables
  - Beets
  - Carrots
  - Potatoes
  - Turnips
- Pinecones
- Flowers
  - Mums
  - Sunflowers
  - Squash flowers
  - Dried flowers
- Pile of leaves
- Hay and straw
- Dirt
- Candy, popcorn, treats

Hands on Science: Dissections

Dissection Extensions:

- **DIY ideas for mats, bowls, trays**
  - Sorting
  - Measuring
  - Identifying

- **Recording**
  - Journals and Notebooks
  - Preservation and Display
  - Photos

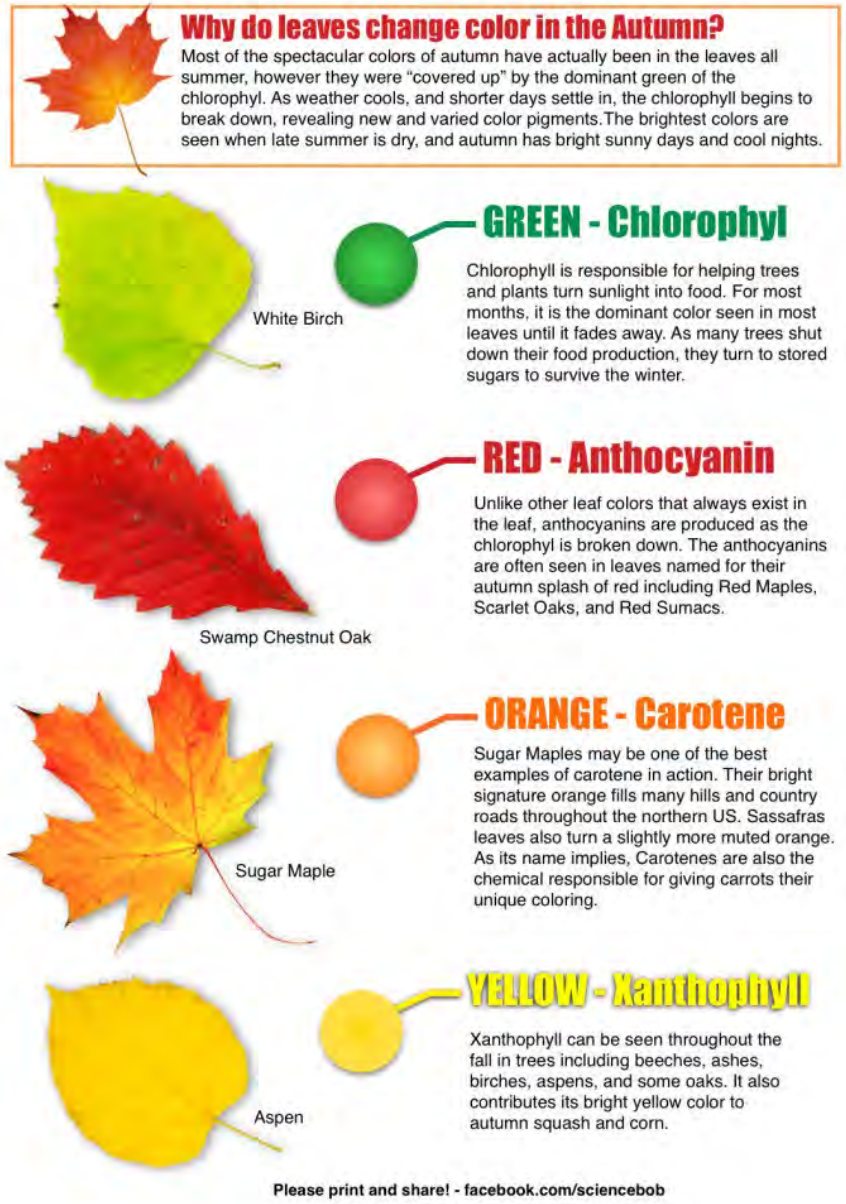
Hands on Science:

Why Do Leaves Change Color in the Fall?

To play along, you'll need:

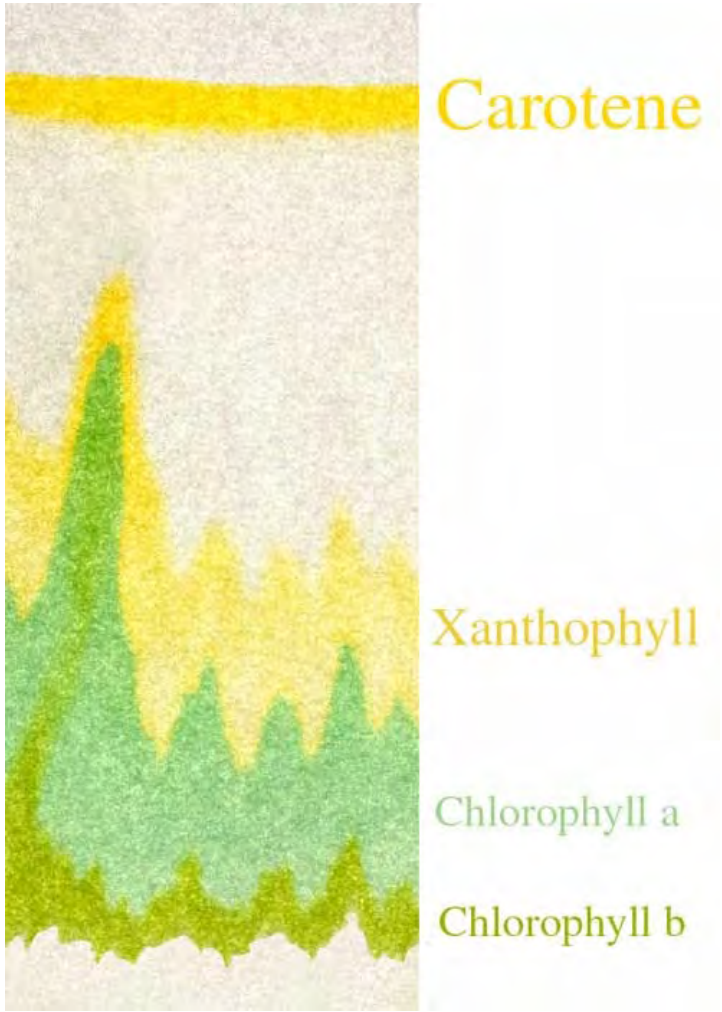
- Vinegar
- Coffee filters
- A tall, clear cup or jar
- Black markers and green markers (Washable- not permanent!)

Why Do Leaves Change Color in the Fall?



Credit: Sciencebob.com

Why Do Leaves Change Color in the Fall?



Credit: University of Wisconsin Plant Teaching Collection

The experiment we did today was an example of paper chromatography. We separated the different pigments in the ink from the markers we used.

The greens and blues in the inks dissolved more easily in the vinegar and traveled up the coffee filter while the less soluble reds and oranges stayed behind.

Paper chromatography can be used to separate the different compounds from plants like in the image to the right.

Hands on Science: Dissections

Poll

How likely are you to use the
“Why do Leaves Change Color in the Fall?”
experiment in your classroom?

Book Break: Nonfiction Books

Uses of Nonfiction Books:

- In centers
- Small group instruction
- Send home for book lending
- Supplemental to story time

Choosing Nonfiction Books

- Offer both illustrated books and books that have photographs
- Look for diagrams with arrows, numbers, timelapse images
- Provide books above reading/comprehension level- if they have good pictures!
- Errors? Just correct and tape over it!

Making the Most of Nonfiction Books

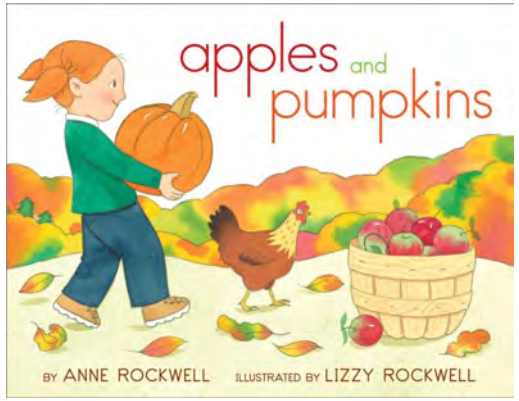
- Post-it questions
- I Spy
- Make a classroom documentary or encyclopedia
- Provide complementary images to cut, laminated images to draw on, etc.

Book Break: Nonfiction Books

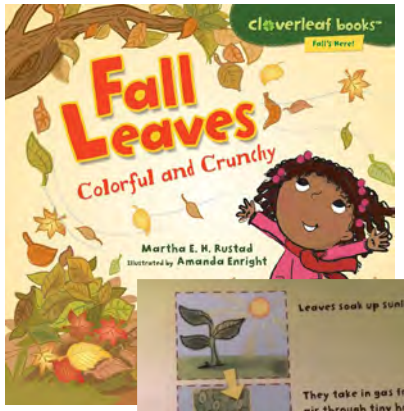
Erika L. Shores

Erika L. Shores

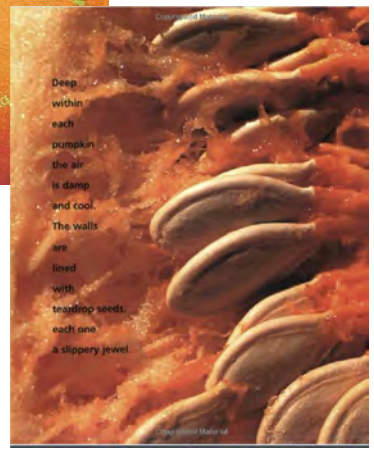
Erika L. Shores



Anne Rockwell

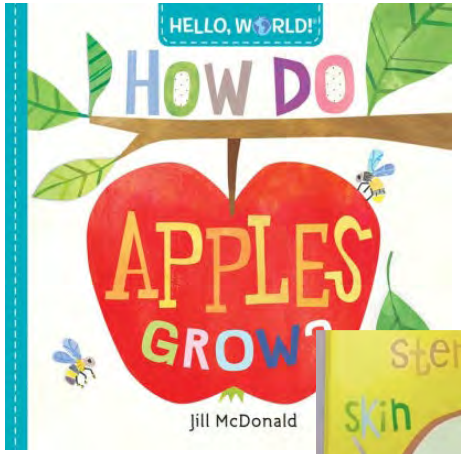


Martha E. H. Rustad



George Levenson

Jill Esbaum



Jill McDonald

Hands on Science:

Fall Engineering

Tree Building Challenge 1:

Build a tree that can stand up nice and straight with only the materials provided. Give each student some clay, popsicle sticks, and leaves. Depending on your students, you can give specifications about the height, how many leaves or branches it must have, etc. You can even have it turn to fall and remove all the leaves and see if your tree still stands up!

Exploration Questions: Was it easy or hard? Who made the tallest tree? The shortest? Which tree had the most leaves or least leaves? Do any of these trees look like trees you've seen before?

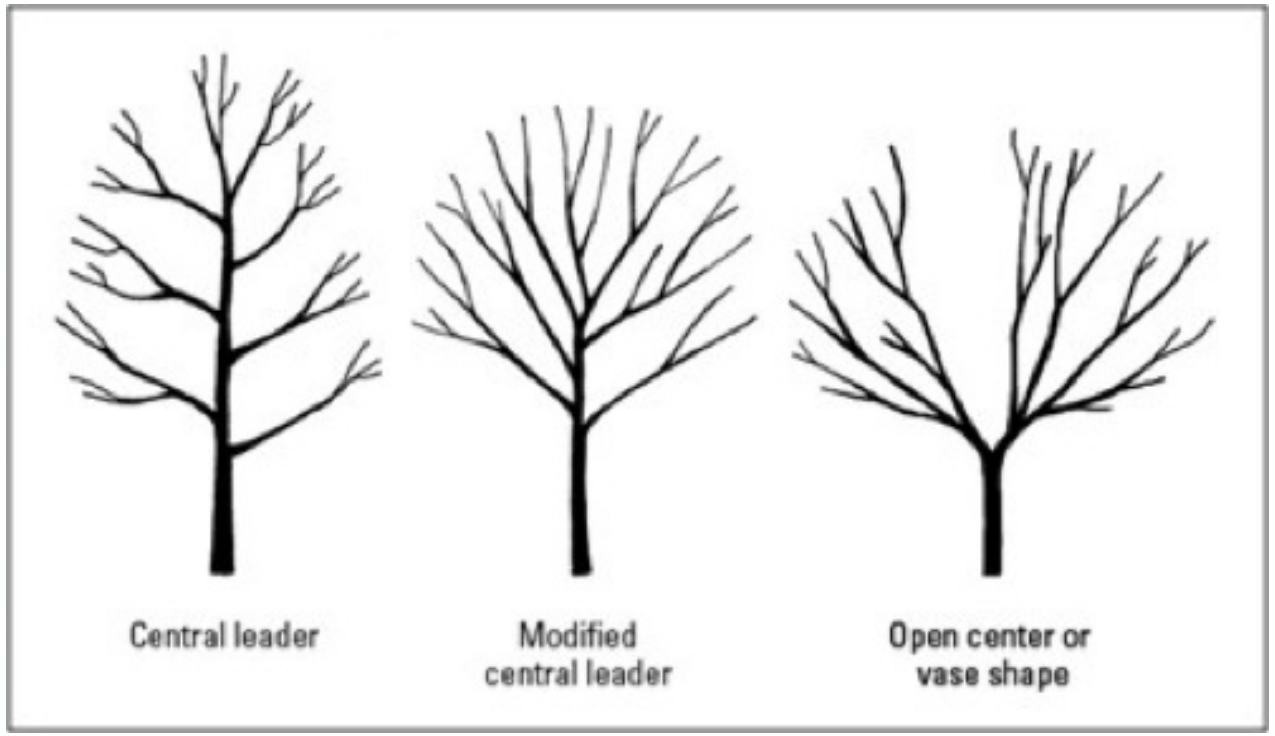
Tree Building Challenge 2:

Build an apple tree that can balance as many apples as possible. Give each student a cardboard tube trunk. Stand the tube upright and encourage them to lay popsicle sticks across the opening of the tube. Predict how many apples (pom poms) they can balance on their apple tree before the branches fall down?

Exploration Questions: How did you decide to add the sticks? Did you choose to put an even or odd amount? Were there things you did that made your tree fall over? Which shape of trees had the most apples on them?

Hands on Science:

Fall Engineering



Credit: gardeningknowhow.com

Most fruit trees have the shape they do because we breed them and prune them to get the biggest fruit the most light.

Apple trees are usually pruned into the central leader shape while peaches and plums are usually in the open center shape.

Hands on Science:

Credit: David Thyberg

Baobab

Credit: Friends of the Port St. Lucie Botanical Garden

Rainbow Eucalyptus

Credit: Global Trees Campaign

Dragon's Blood

Hands on Science: Fall Engineering

Poll

How likely are you to use these
“Fall Engineering” activities in your classroom?

Book Break: Fiction Books

Books don’t have to be factual to be impactful!

Fiction in ECE science instruction can help students to:

- Contextualize complex scientific ideas
- Think critically about real vs. imaginary
- Build emotional connections to content

Choosing Science-Centered Fiction Books

- A realistic setting and plot are more helpful than realistic characters
- Look for books in which characters are curious, search for solutions through experimentation or research, or have one idea about something and change their minds when presented with evidence
- Pick books that are fun (and sometimes ridiculous!)

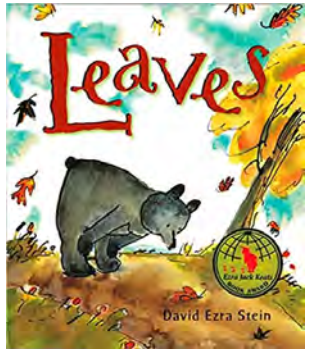
Making the Most of Fiction Books

- Pair with nonfiction books on similar topics
- Spot the Science and Would You Rather?
- Questions, questions, questions!

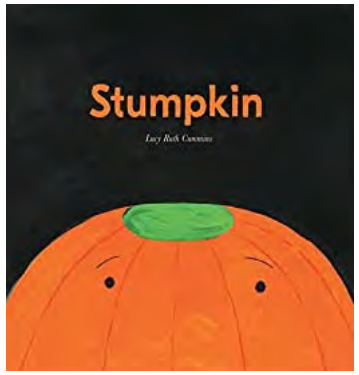
Book Break: Fiction Books

Kenard Pak

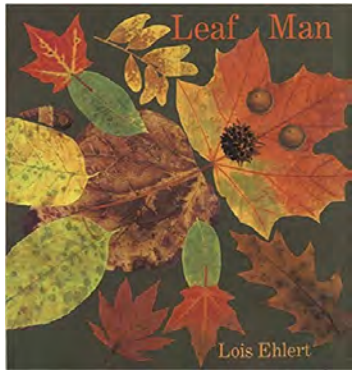
Kenard Pak



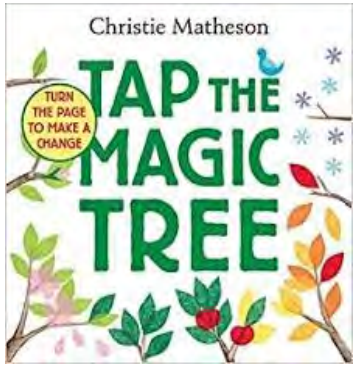
David Ezra Stein



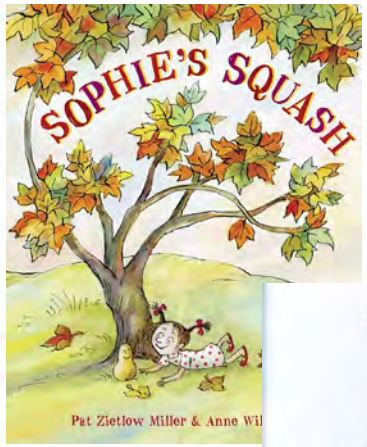
Lucy Ruth Cummins



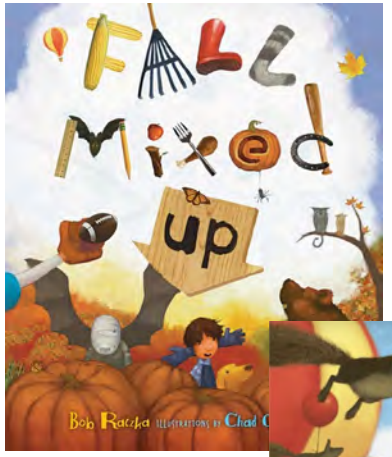
Lois Ehlert

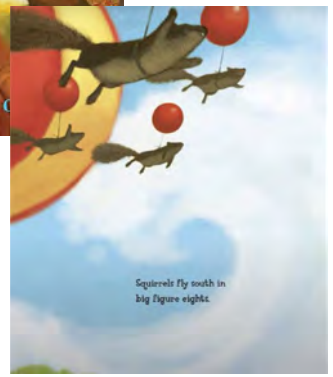


Christie Matheson

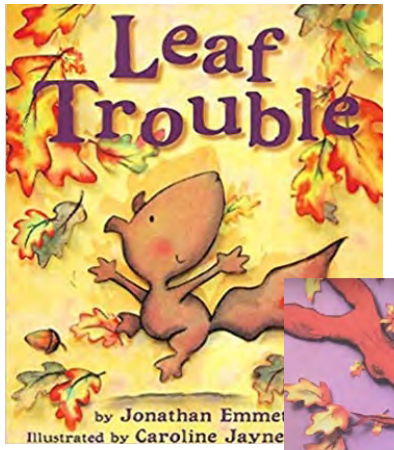


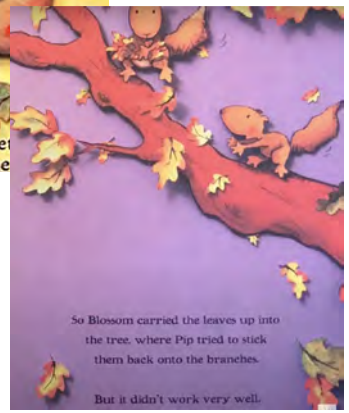
Pat Zietlow Miller



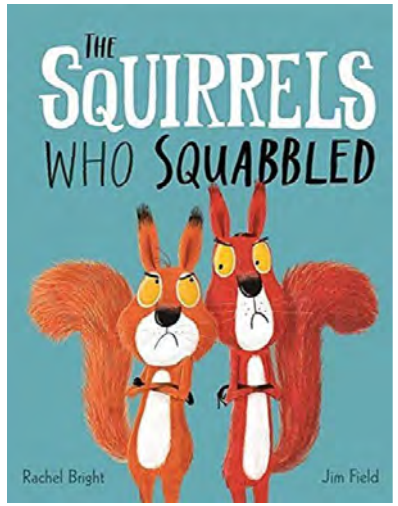


Robert Raczka



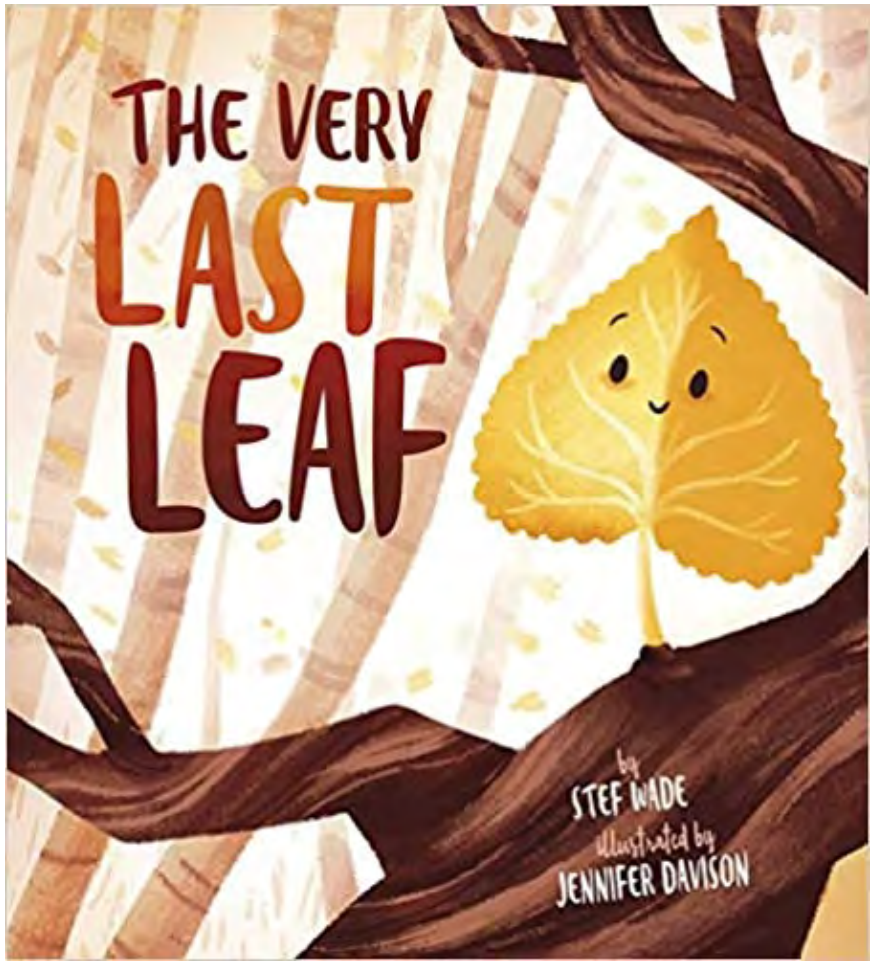


Jonathan Emmet



Rachel Bright

Book Break: Fiction Books



The Very Last Leaf
by Stef Wade

Hands on Science:

Autumn Animal Antics

Activity 1: Flying South.

- **Find a large space in your classroom and tape a V shape on the floor. Stand at the point of the V and then ask your students to line up on the V and face you.**
- **Ask them to do what you do.**
- **Let other students have a chance to be the goose leader.**
- **Extension for older students: Try taking your goose V on the move. In an outdoor space, play follow the leader while trying to match your wing flaps and stay in your V!**

Exploration Questions: Was it hard to match me when I was flapping my arms? Did you feel tired at any point during this game?

Activity 2: Gather food.

- **Spread the "food" that will be collected throughout the classroom or playground.**
- **Some students will collect and store their food like tree squirrels and chipmunks.**
- **Some students will collect food and "eat" it like woodchucks and bears.**

Exploration Questions: Was it easier to collect food when you were eating it or when you were stashing it? Can you share food with each other as a stasher or an eater?

Hands on Science:

Autumn Animal Antics

Activity 3: Build a warm den

- Give each student or groups of students a plastic cup taped to a plate.
- Let students place their hands in the cup and place the ice pack on top.
- Challenge the students to make the den warmer by adding leaves and grass to the cup. Then, place their hands inside, nestle in the leaves and grass, and add the ice pack to the top of the cup.
- Finally, add the clay to the outside of the cup- now your den is underground! Place the students' hands back inside and add the ice pack. Add their second hand (if there's room) like animals snuggling up together. T
- Extension/Alternative: Allow the students access to all the supplies, and include man-made materials like pom poms, felt, cut up old socks or mittens and challenge them to make the warmest den they can make!

Hands on Science:

In the fall, animals typically do one or a combination of the following:

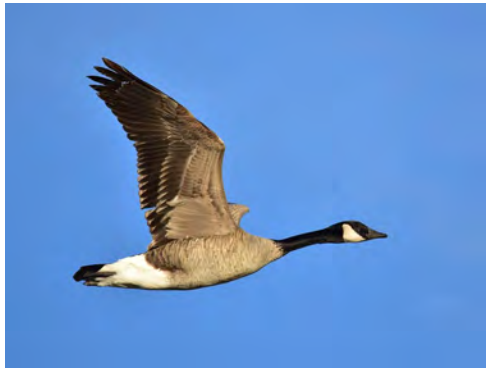
Gather lots of food (and eat it!)

- Bears
- Woodchucks

Gather lots of food (and store it!)

- Tree Squirrels
- Chipmunks

Migrate



- Geese
- Monarch butterflies

Hands on Science: Fall Engineering

Poll

How likely are you to use these
“Autumn Animal Antics” activities in your classroom?

Ready for Fall Science?

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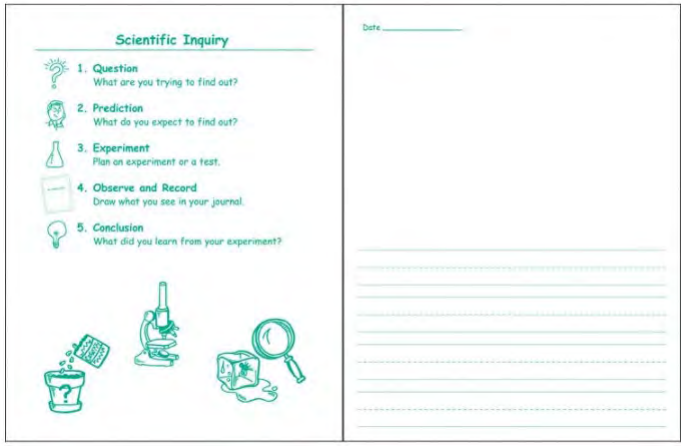
#ZBECK144



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Winter!

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