


It's Time for an Agventure:

Bring Your Classroom to Life with STEM and Agriculture

Illinois AGRICULTURE in the Classroom℠

Resources


ILLINOIS FARMERS MARKETS • SPRING & SUMMER
ASPARAGUS
SWEET CORN
FLOWERS
CUCUMBER
Illinois AGRICULTURE in the Classroom
IAA FOUNDATION


ILLINOIS FARMERS MARKETS
FALL & WINTER
ONIONS
POTATOES

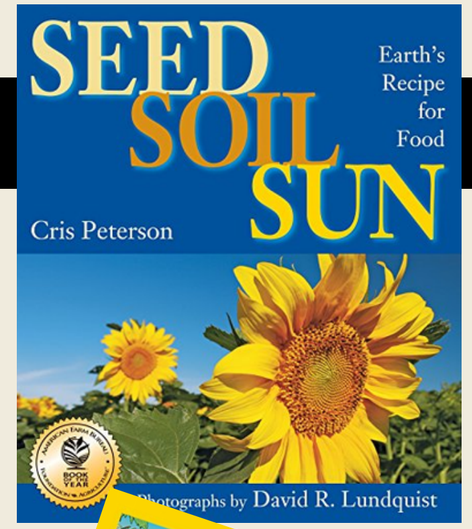

Illinois Ag Mag
Pollinators
Pollination & Illinois Agriculture
What is Pollination?
How Pollination Works
PARTS OF A FLOWER

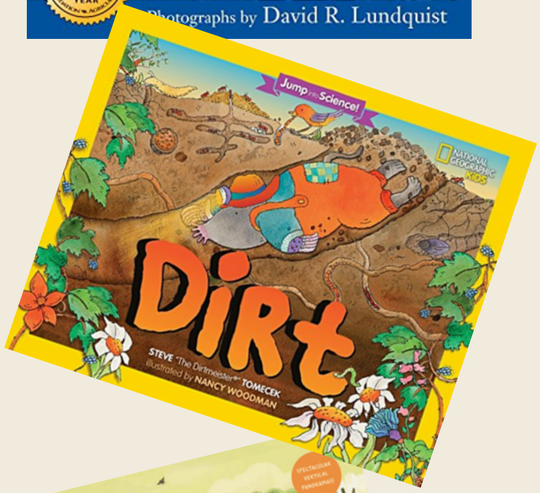

ILLINOIS
APPLES
TOP VARIETIES GROWN BY ORCHARDS IN IL
McIntosh
Rome
Arkansas Black
Red Delicious
Zestar
Winesap
Jonagold
Jonathan
Golden Delicious
GoldRush
EverCrisp


ILLINOIS
PUMPKINS
TYPES OF PUMPKINS
PIE
WHITE
JACK-O-LANTERN
PROCESSING
GIANT
MINIATURE
SPECIALTY
PUMPKIN FACTS
IL PUMPKIN FACTS

STEM in Agriculture

Slice of Soil

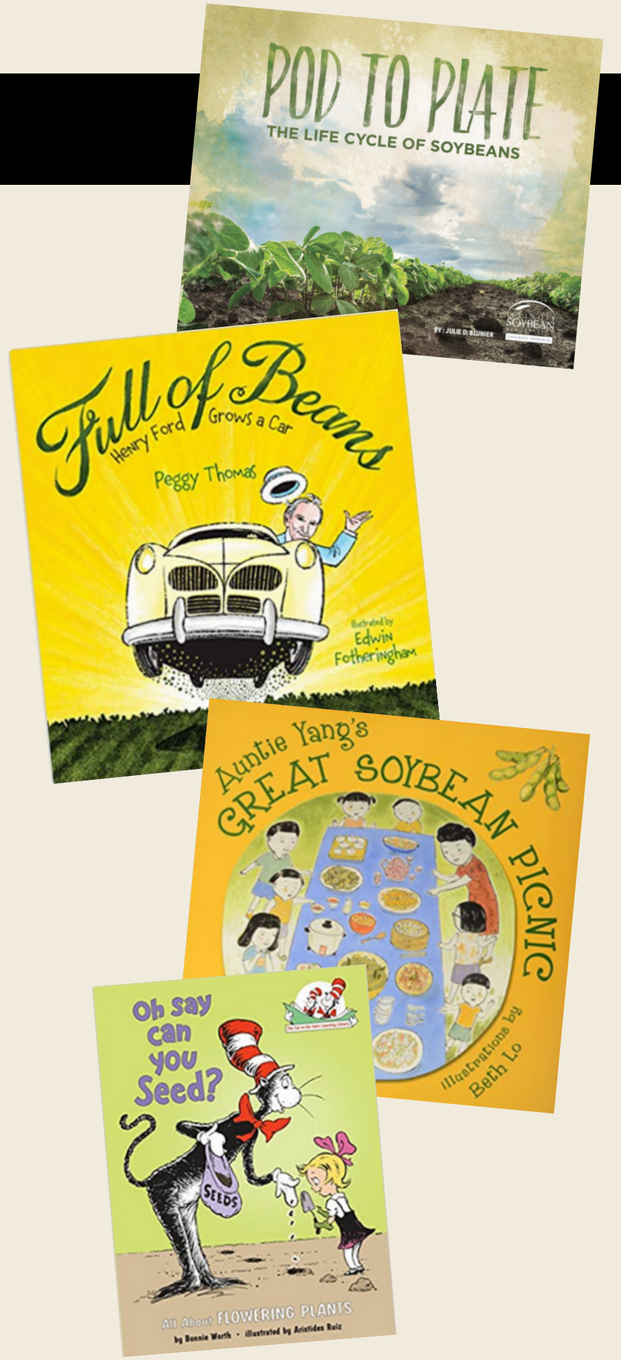




Soybeans

Beanie Baby

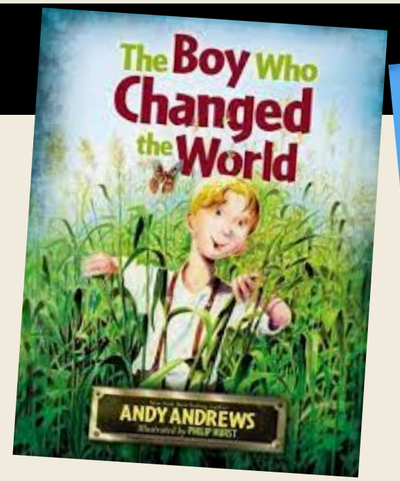
K-7

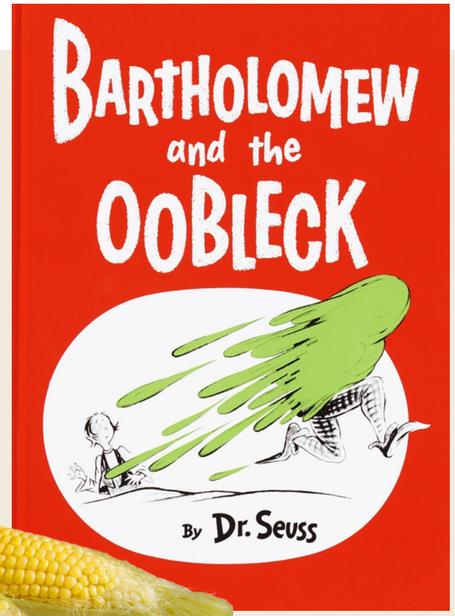


Oobleck

Background Information:
Sir Isaac Newton is known for his properties in Physics. During his career, he described solids, liquids, and gasses as having a set of properties that are distinct to their state of matter. When focusing on liquids, he proposed that fluids should flow at a predictable, constant rate. These fluids are called “Newtonian” fluids.

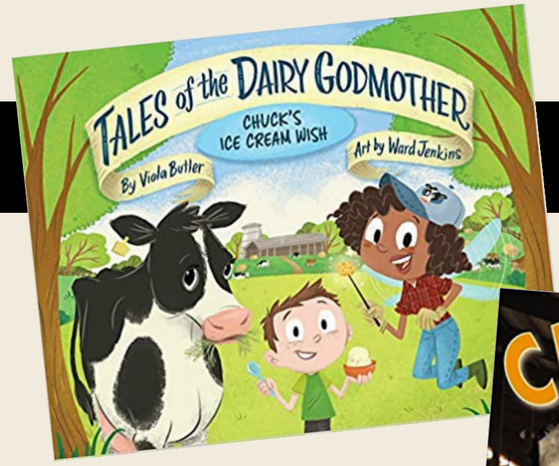
Although Oobleck looks like a liquid, it does not always behave a liquid. Oobleck is a type of material belonging to the “non-Newtonian” class of fluids. Non-Newtonian fluids respond differently depending on how quickly you try to move it around. When a force is acted on Oobleck quickly, it will behave like a solid because the pressure forces all the particles of the corn starch together. When the force is slower, the particles of the corn starch have time to move around the object, just as a normal Newtonian liquid would.

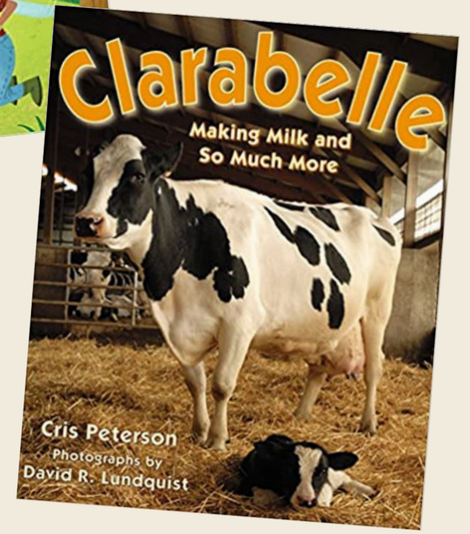




Oobleck

Milk Plastic





Milk Plastic

Science

Grade Level
4-6

Length of Lesson
30 minutes

Objective
By the end of this lesson, students will have a better understanding of how sensitive the fats and proteins of milk are to new substances.

Materials Needed
- Milk (1 cup per student)
- White vinegar (4 tbs per student)
- Small bowls
- Spoons
- Strainer(s)
- Paper Towels
- Measuring cups
- Food coloring and cookie cutter shapes (optional)

Standards
Common Core
CCSS.ELA-Literacy.RI.4.3; RI.5.3

NGSS
5-PS1; MS-PS1

Lesson Summary
This lesson is a fun, hands-on activity designed to help students understand how proteins are sensitive to acids.

Suggested Sequence of Events:
1. Set Up: Complete this as a demonstration, group activity, or individual activity depending on time and materials. If you're using this as a student activity, make sure students use caution as the milk can be hot and burn skin in the first few steps.
2. Read through the IAITC Dairy Ag Mag to learn more about milk and other dairy products! Interactive online versions can be found on our website.
3. Complete the activity following the procedures:
   - Observe the milk and vinegar solutions, noting their color, texture, scent, etc.
   - Measure 1 cup of milk into a microwaveable bowl and microwave for 1.5 minutes. The milk should be hot but not boiling.
   - Stir in 4 tablespoons of white vinegar into the milk and stir for 1 minute. The milk will start to form clumps!
   - Carefully pour this substance into the strainer. Use your spoon to push the liquid out. This may take a little elbow grease!
   - Transfer the remaining "plastic" to a paper towel and continue to press, making sure all the liquid is out.
   - Have fun and mold the plastic into a shape either by hand or using a cookie cutter. Use food coloring to add some flare!
   - Set the formed plastic aside and let it dry for 2 days.
   - Compare and contrast the original ingredients to the final product.
4. Whole class discussion and reflection of activity. Here are some prompting questions:
   - Describe how the milk reacted when you first added the vinegar (step number 2).
   - What happened when you began pressing the liquid out of the clumped milk?
   - Why do you think the milk turned into a "plastic"? Read the background information on the teacher resources page and share with your students.

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BUTTER IN A JAR

Ingredients
- Liquid whipping cream
- Clean baby food jar(s)

Directions
- Pour whipping cream into baby food jar until half full.
- Screw on lids. Double check to make sure the lids are securely closed!
- Start shaking the jar to "churn" the cream. Shake the jar until you can no longer hear the liquid moving.
- Check the jars to see if the cream has separated into milky liquid and creamy solid butter.
- Carefully pour off the liquid.
- Serve your homemade butter on bread or crackers and enjoy!

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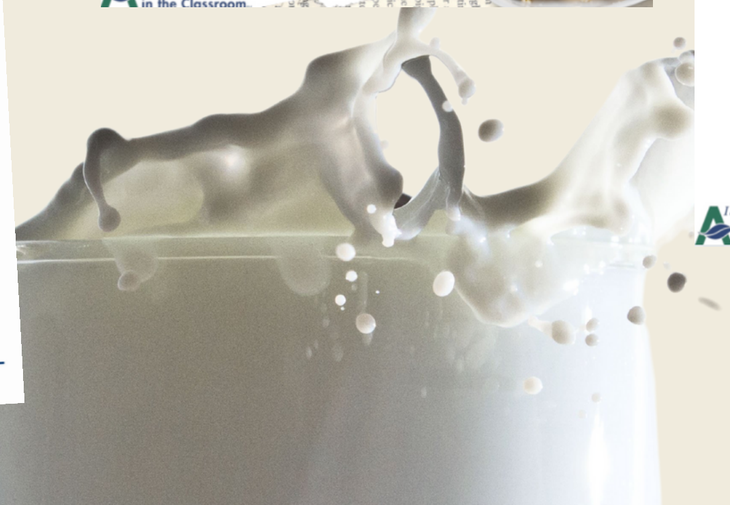


ICE CREAM IN A BAG

Ingredients
- 1/4 cup sugar
- 1/2 tsp vanilla extract
- 1 cup milk
- 1 cup whipping cream
- Crushed ice (1 bag of ice will freeze 3 bags of ice cream)
- 1 cup rock salt (approximately 8 cups per 5 lbs.)
- 1 quart and 1 gallon size Ziploc® bags
- Duct tape
- Bath towel

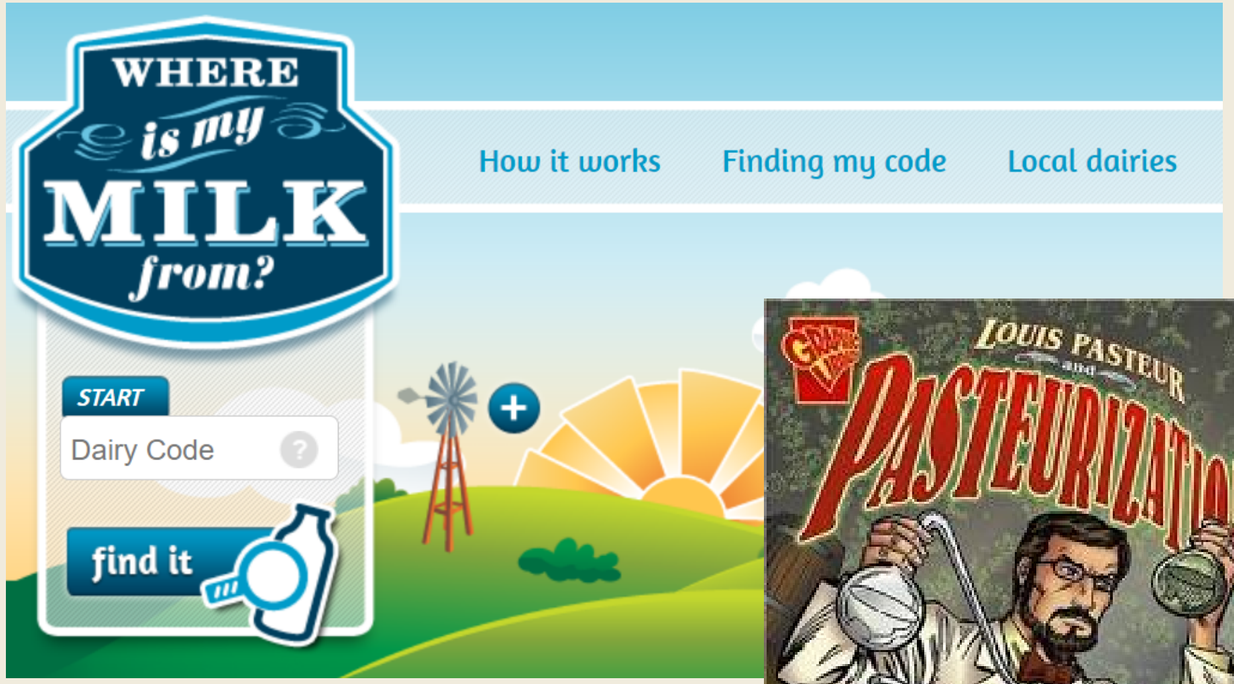
Directions
- Put the milk, whipping cream, sugar, and vanilla in a 1 quart freezer bag and seal. For security, fold a piece of duct tape over the seal.
- Place the bag with the ingredients inside a gallon freezer bag.
- Pack the larger bag with crushed ice around the smaller bag. Pour ¾ to 1 cup of salt evenly over the ice.
- Wrap in a bath towel and shake for 10 minutes. Open the outer bag and remove the inner bag with the ingredients. Wipe off the bag to be sure salt water doesn't get into the ice cream.
- Cut the top off and spoon into cups or cones.
- Enjoy plain or top with nuts, coconut, or fruit!

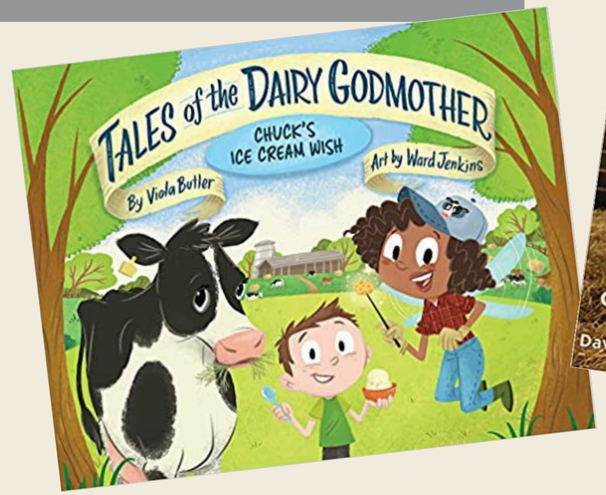
Serves 4 people!

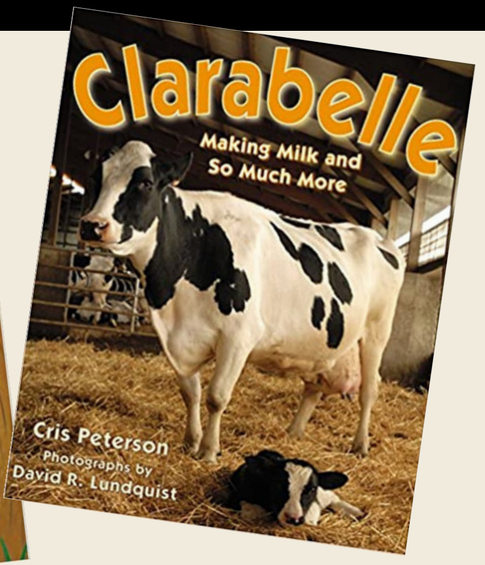
Illinois AGRICULTURE in the Classroom

www.whereismymilkfrom.com

Where is My Milk From?







Moo Mask

MOO MASK

Math | Art

Grade Level
K-2

Length of Lesson
45 minutes

Objective
By the end of this lesson, students will be able to demonstrate an ability to identify types of cattle based on markings.

Materials Needed
- Large paper plates (1 per student)
- Small paper plates (2 per student)
- Scissors
- Glue or staples
- Crayons, markers, or colored pencils
- Colored construction paper
- Copies of the ear tag template
- Copies of the student ear tag worksheet

Standards
Common Core
CCSS.Math.Content: K.OA.A.1-3; K.OA.A.5; K.MD.B.3

Illinois Visual Arts
VA:Cr2.2.PK; Cr2.3.PK; Cr2.1.1; Re7.2.1

Lesson Summary
This lesson is designed to help students recognize different breeds of dairy cattle as well as help them practice their addition and counting skills.

Suggested Sequence of Events:
1. Set up: Print the student worksheet out and cut on the dotted line for each student. Then, print the ear tag templates on various color of construction paper.
2. Read "Clarabelle" by Cris Peterson to capture student interest.
3. Read through the AITC Dairy Ag Mag to learn about Dairy breeds and products. Interactive online versions can be found on our website.
4. Complete the activity following the procedures:
   - Have the students cut one dessert plate in half.
   - Have the students staple or glue the other dessert plate behind the large dinner plate.
   - They should draw eyes on the dessert plate and a mouth on the dinner plate.
   - Next, use the dessert plate that was cut in half to make two ears that are glued or stapled to the top of the dessert plate with the eyes.
   - Have the AITC Dairy Ag Mag available so that students can look at the various breeds of dairy cattle. Then, have the students color the cow to match their favorite breed.
   - Attach string to the side of the mask to allow it to wrap around their heads.
   - Have students create their tags! (directions on Teacher Resources page)
4. Whole class discussion and reflection of activity. Pair students together and have them share their moo masks with each other!

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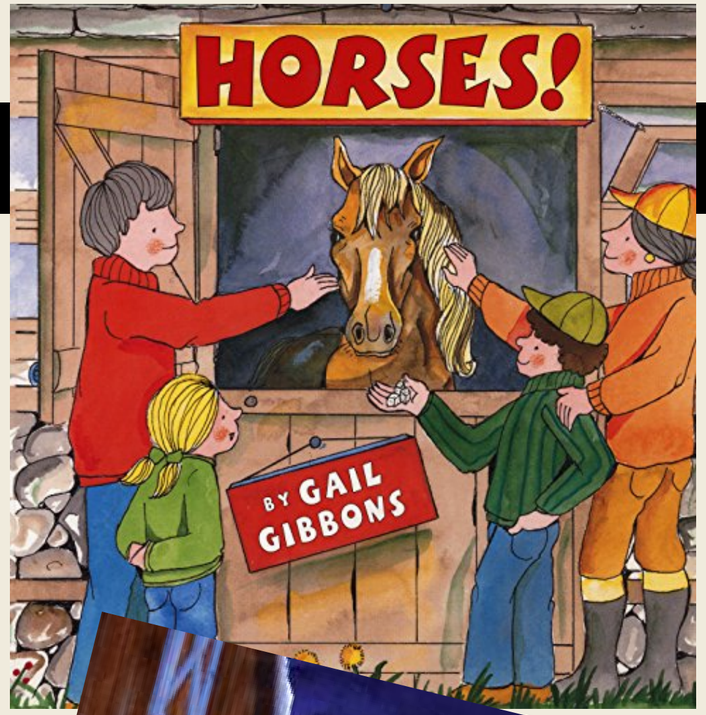
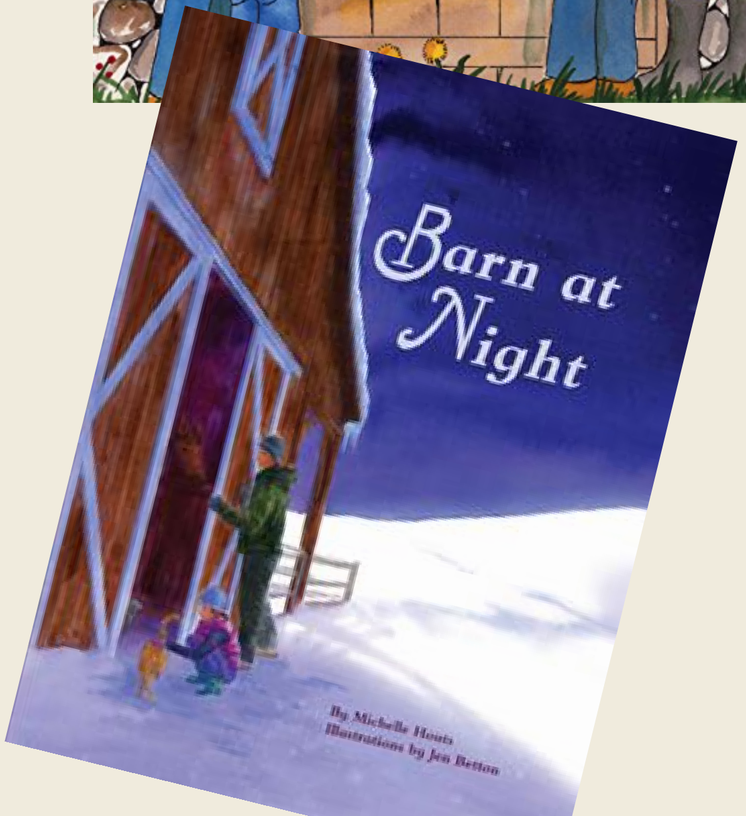
Paper Horse


HORSES!
BY GAIL GIBBONS


Barn at Night
By Michelle Houts
Illustrations by Jen Betton

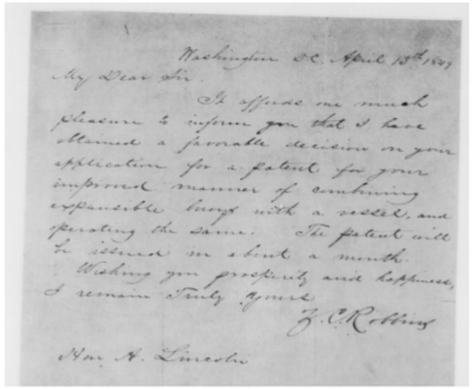
Lincoln's Patent

Lincoln's Patent

Social Studies

Student Worksheet

Below is an image of the original letter sent from Zenas Robbins to Abraham Lincoln regarding Lincoln's patent application. The letter is a *primary source*. A primary source is an artifact of some sort that was created by a person with immediate, first-hand knowledge of a topic or event. Historians use primary sources to better understand our history through the eyes of the people who actually lived it.



Here is a transcript of the same letter:

Washington D.C. April 13th 1849

My Dear Sir.

It affords me much pleasure to inform you that I have obtained a favorable decision on your application for a patent for your improved manner of combining expansible buoys with a vessel, and operating the same. The patent will be issued in about a month.

Wishing you prosperity and happiness, I remain truly yours.

Z.C. Robbins

Hon A. Lincoln

Lincoln's Patent

Social Studies

Student Worksheet

Analyzing a Primary Source: Hand Written Letter

You are going to complete a close reading of Zenas Robbins' letter to Abraham Lincoln. A close reading is a careful, critical analysis of a passage or text to develop a better understanding of the meaning of the text without relying on other information.

Use the questions below to help you analyze this text. You will need to read the letter more than once to fully understand it and answer all the questions. You may use either the original letter or the typed transcript to complete these questions.

Read Through #1

The first time reading through the text is to help you become familiar with the general features and ideas.

Read the letter. As you're reading, underline any words you don't recognize.

Who wrote the letter?

Find the date the letter was written and circle it.

Does the author of the letter know Abraham Lincoln? What evidence in the letter supports your answer?

Lincoln's Patent

Social Studies

Student Worksheet

Read Through #2

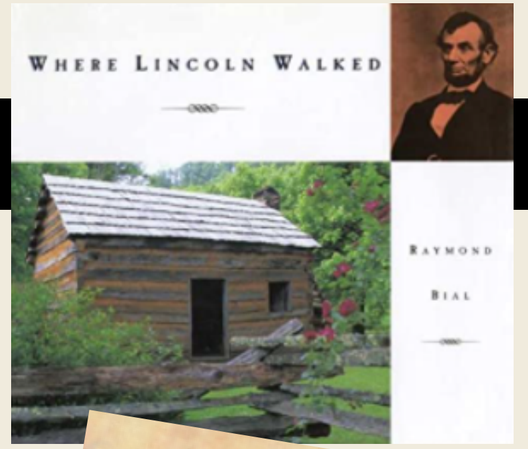
The second time reading through the text challenges you to dig deeper and focus on more specific or individual parts.

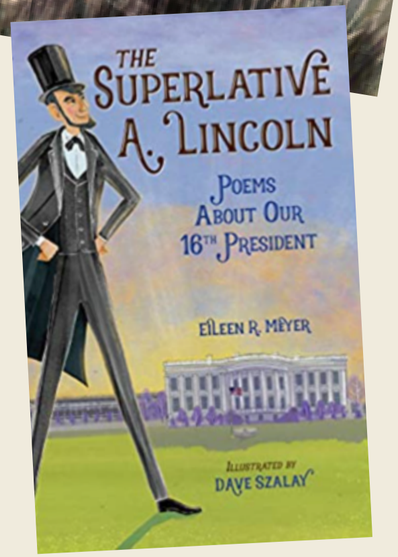
Read the letter again. Choose one sentence or phrase that you find interesting or important and write those words in this box.

Why did this sentence/phrase attract your attention?	How does this sentence/phrase help you understand what this letter is about?

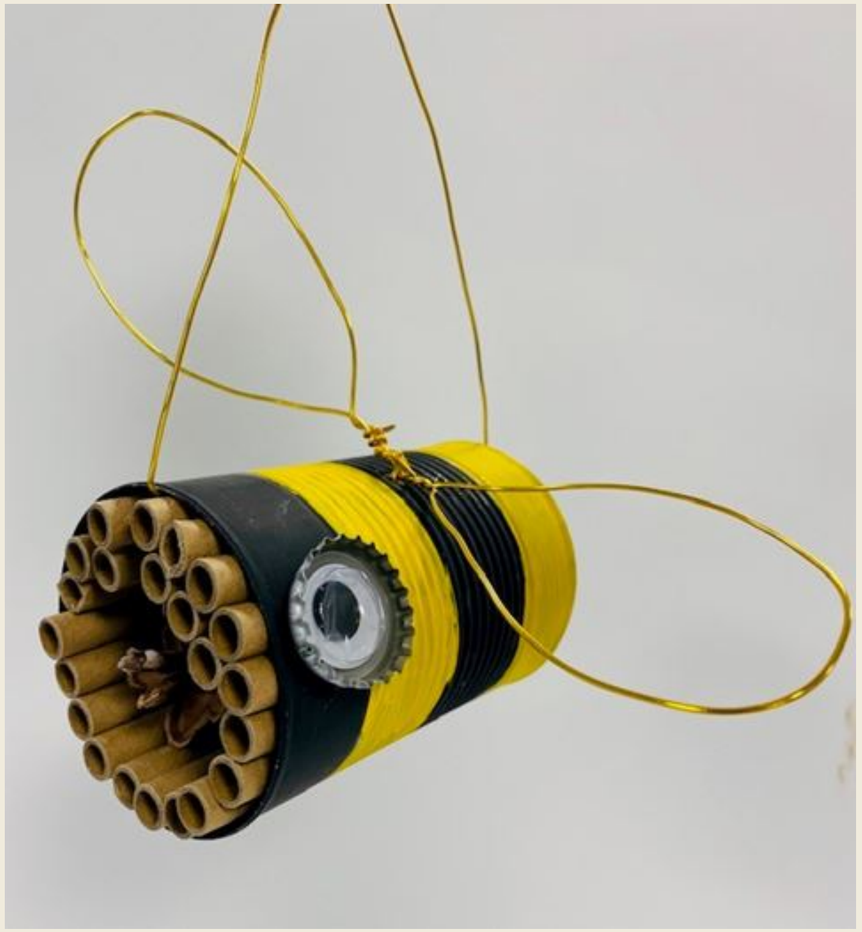
Final Analysis

1. Write one question you still have about the letter.
2. How could you find the answer to this question?
3. What was the purpose of this letter?
4. Why might this letter be considered an important historical document?

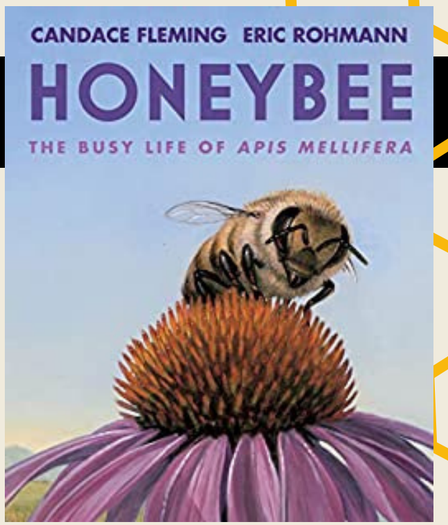




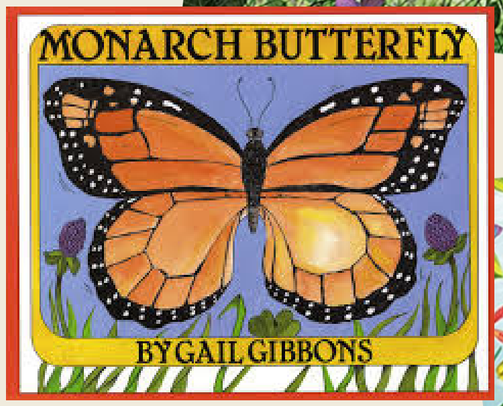
Bee Hotel



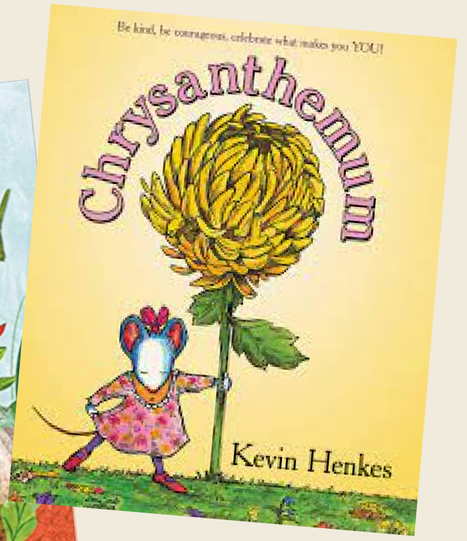

FLOWER TALK
HOW PLANTS USE COLOR TO COMMUNICATE
SARA LEVINE
ILLUSTRATIONS BY MASHA D'YANS


CANDACE FLEMING ERIC ROHMANN
HONEYBEE
THE BUSY LIFE OF APIS MELLIFERA

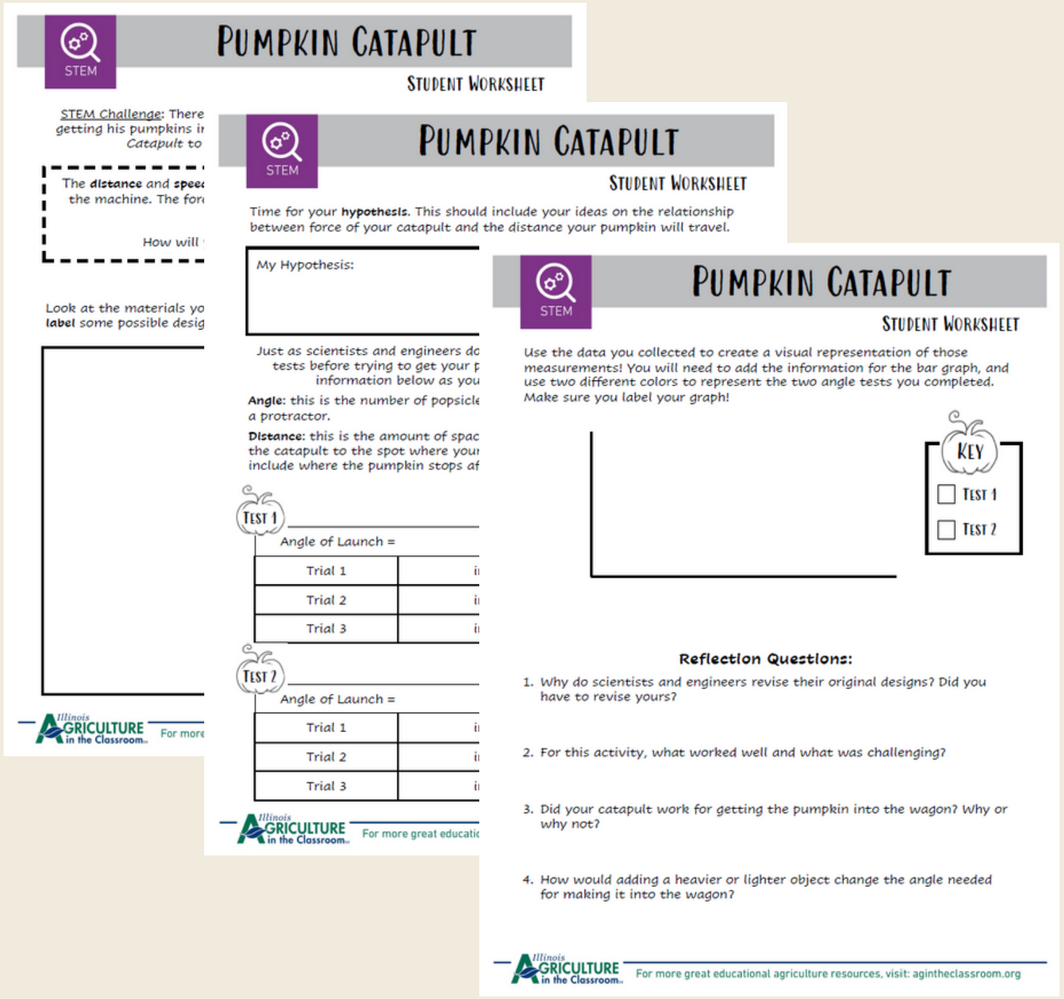

FLOWERS ARE CALLING
WORDS by RITA GRAY PICTURES by KENARD PAK


MONARCH BUTTERFLY
BY GAIL GIBBONS


GROW HAPPY
by Jon Lasser, PhD, and Sage Foster-Lasser
illustrated by Christopher Lyles


Be kind, be courageous, celebrate what makes you YOU!
Chrysanthemum
Kevin Henkes

Pumpkin Catapult



Pumpkin Catapult

Student Worksheet

STEM Challenge: There
getting his pumpkins i
Catapult to

The distance and speed
the machine. The for

How will

Look at the materials yo
label some possible desig

Illinois Agriculture in the Classroom For more

Pumpkin Catapult

Student Worksheet

Time for your **hypothesis**. This should include your ideas on the relationship between force of your catapult and the distance your pumpkin will travel.

My Hypothesis:

Just as scientists and engineers do tests before trying to get your p information below as you

Angle: this is the number of popsicle a protractor.

Distance: this is the amount of spac the catapult to the spot where your include where the pumpkin stops af

Test 1

Angle of Launch =

Trial 1	i
Trial 2	i
Trial 3	i

Test 2

Angle of Launch =

Trial 1	i
Trial 2	i
Trial 3	i

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Pumpkin Catapult

Student Worksheet

Use the data you collected to create a visual representation of those measurements! You will need to add the information for the bar graph, and use two different colors to represent the two angle tests you completed. Make sure you label your graph!

KEY

- ☐ Test 1
- ☐ Test 2

Reflection Questions:

1. Why do scientists and engineers revise their original designs? Did you have to revise yours?
2. For this activity, what worked well and what was challenging?
3. Did your catapult work for getting the pumpkin into the wagon? Why or why not?
4. How would adding a heavier or lighter object change the angle needed for making it into the wagon?

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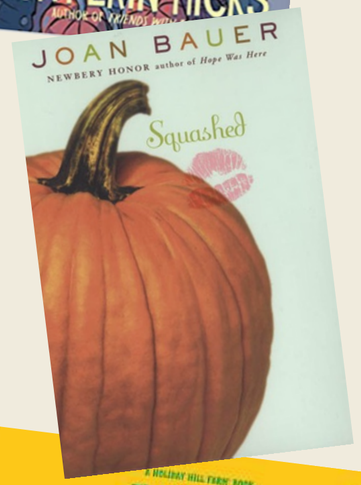
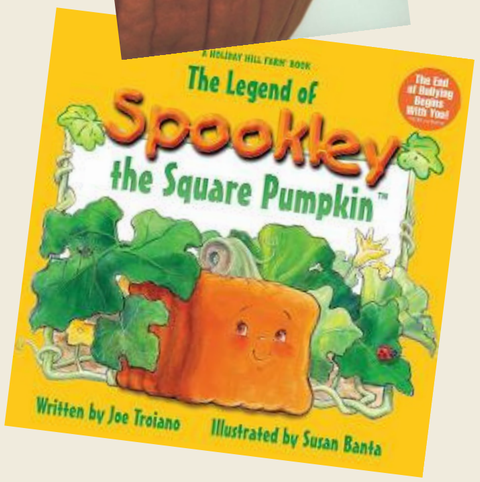
Catapult designed by a 1st grader

Catapult made with instructions

PVC Catapult



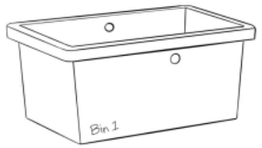


Vermicomposting

TEACHER RESOURCES

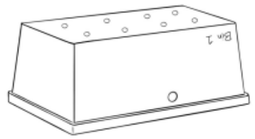
Holes for Ventilation

1" drilled holes
Top, 2 sides of the first bin



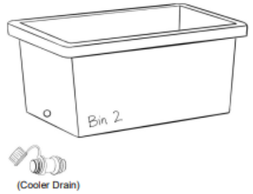
Holes for Drainage

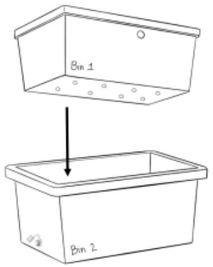
1/8" drilled holes
Bottom of the first bin



Hole for Cooler Drain

1" drilled hole
Bottom edge, 1 side of the second bin





Assembly

Secure the cooler drain in the hole drilled at the bottom of the second bin. Then, place the first bin into the second bin.

Your vermicomposter is ready for its materials and tenants!

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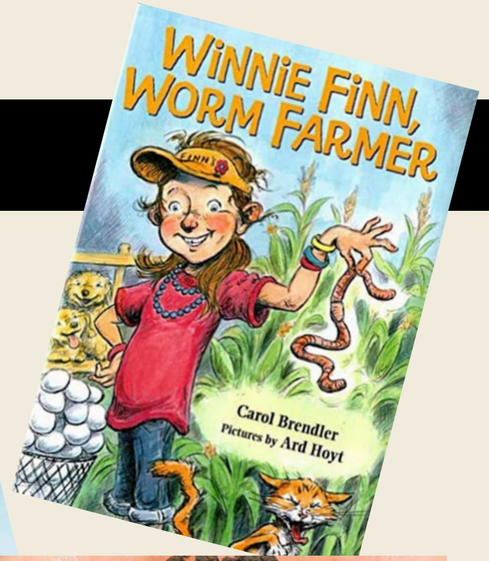

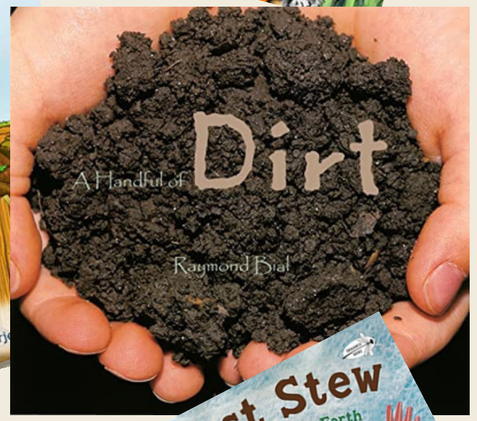

Solar Oven


TIME to SHINE!
MAKER
Make It Work
Solar Energy
BY CATHERINE DALY
ILLUSTRATED BY STELIYANA DONEVA

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