



# AG IN THE CLASSROOM 101

*Lessons and Activities  
for New Coordinators*

*September 2021*

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# APPLE BLOSSOM TREE

## Grade Level

K-3

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will understand the apple life cycle.

## Materials Needed

- Brown and green construction paper
- Pink and white tissue paper
- Scissors
- Glue Sticks
- Brown Markers
- Red circle Stickers
- Bee/Bug Stickers

## Standards

### NGSS

Earth's Systems: K-E552-2

From Molecules to organisms: K-LS1-1

## Lesson Summary

Apple trees bloom in the spring and ripen in the fall. This lesson is designed to help students understand the apple growth process.

## Suggested Sequence of Events:

1. Set Up: Cut out two green treetops and one brown tree trunk for each tree.
2. Read "[The Apple Pie Tree](#)" by Zoe Hall to capture student interest.
3. Read through [AITC Apple Ag Mag](#) to learn about apples. Interactive online versions can be found on our website.
4. Complete the activity following the procedures:
  - Glue the tree trunk to one of the tops.
  - Match up with the other top and glue it on.
  - Cut pink and white tissue paper into small squares.
  - On one side of the tree, glue on the crumpled tissue paper to represent blossoms. Growth starts with the blossoms.
  - Add a bug or bee sticker to the blossoms. This represents how pollination must occur for an apple to grow.
  - Label the blossom side of the tree trunk "spring."
  - On the other side of the tree, stick red circle stickers on the tree top to represent apples. Use a brown marker to draw a stem.
  - Label this side of the tree trunk "fall."
5. Whole class discussion and reflection of activity. Pair students together and have them share their apple trees with their partner, showing how apples grow.

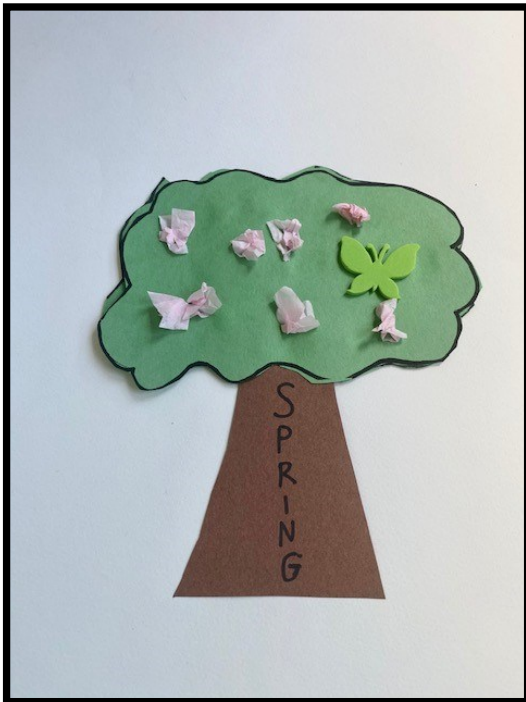
# TEACHER RESOURCES

## Extension Ideas:

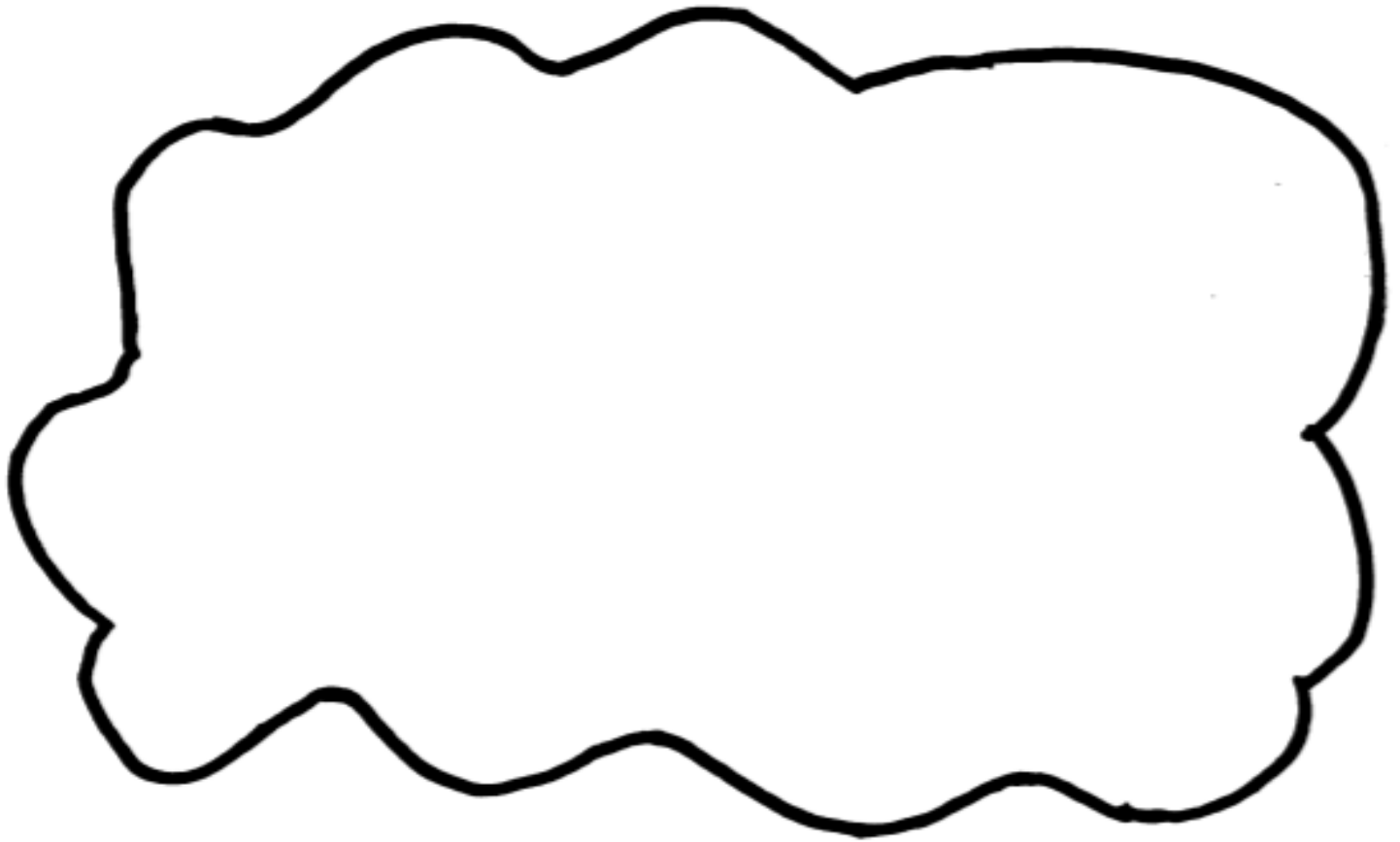
- Read "[From Seed to Apple](#)" by Anita Green. Look at the pictures and have students analyze the images.
- Have students create a comic strip showing the apple life cycle.
- Have students tell a story from the seed's perspective, becoming a flower, being pollinated, and then becoming an apple.
- Introduce or teach about photosynthesis.
- Take a closer look at bees and other pollinators. What is pollination? Why is it important for apples?
- Watch a time lapse video of an apple growing.
- Watch a video from a local farmer discussing what they do in the spring and in the fall.
- Take a field trip to an orchard and pick your own apples.
- Use our "Apple Chain" lesson to deepen understanding of the life cycle of an apple.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!

## Media Resources:

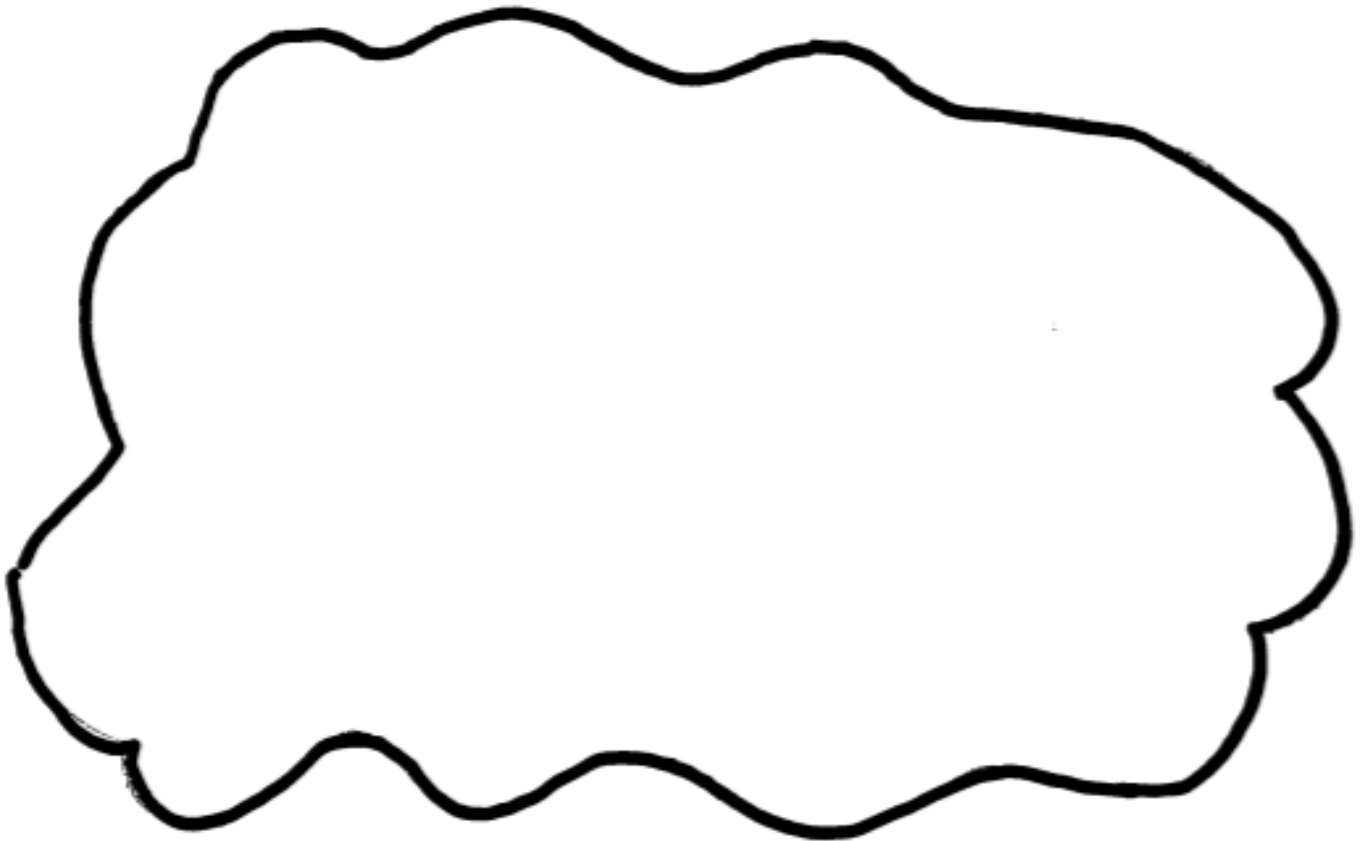
Use this video to introduce or demonstrate this activity: <http://iaitc.co/appleblossom>

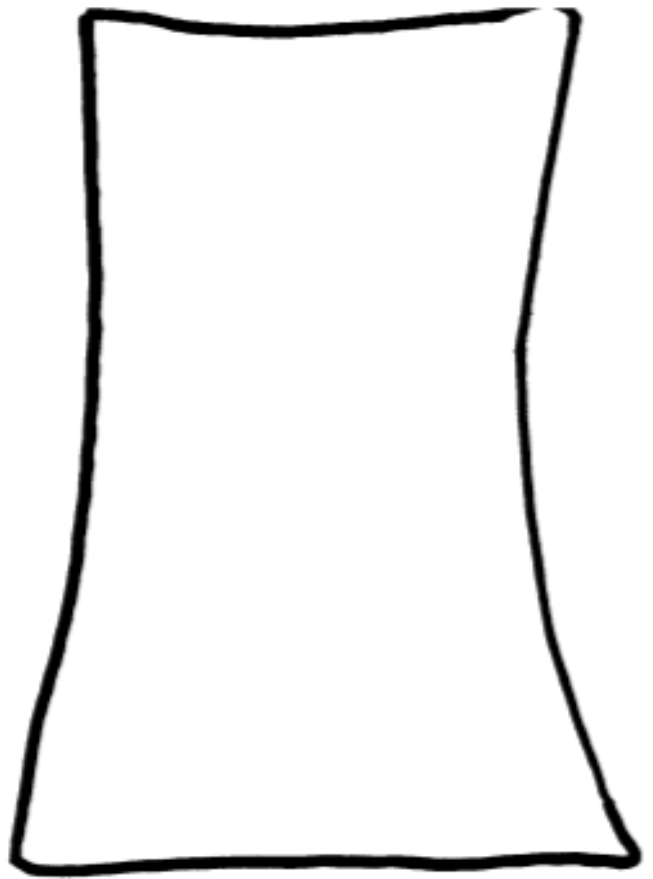
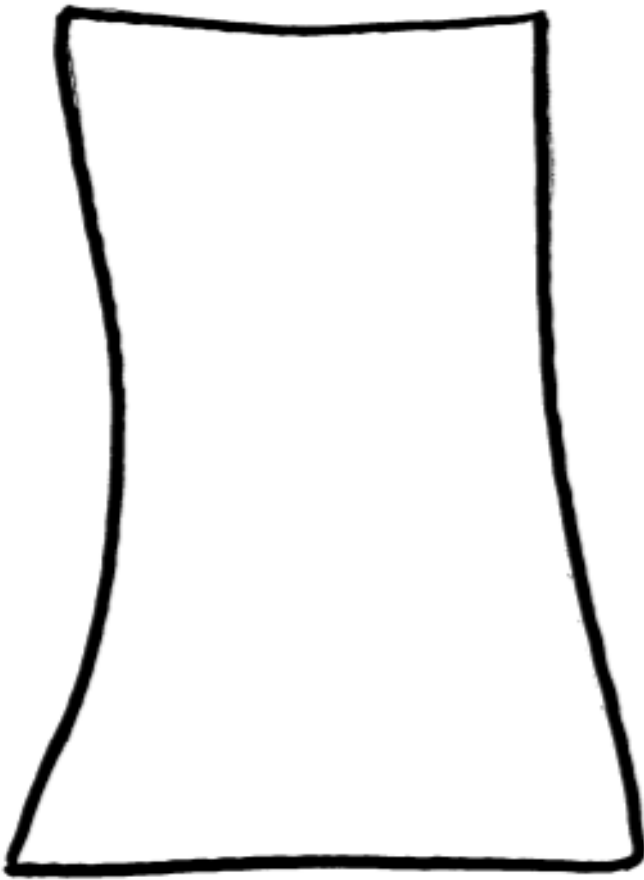




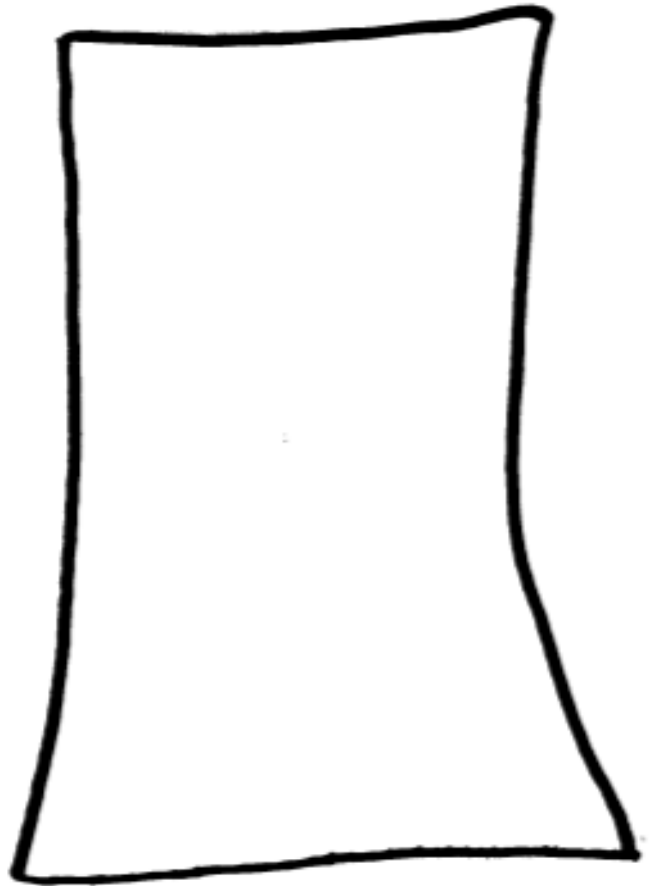


Leaves





Trunk





# APPLE CHAIN

## Grade Level

K-3

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will have a better understanding of the life cycle of an apple tree.

## Materials Needed

- 2 Red Paper Plates (per student)
- Colored Construction Paper
- Templates
- Stapler and Staples
- Tape
- Yarn
- Hole Punch

## Standards

### Common Core

CCSS.ELA-Literacy.RL.4.3; W.4.2

CCSS.Math.Content.4.MD.2

### NGSS

K-LS1-1; 3-ESS2-1;  
3-LS1-1; 3-LS3-1

## Lesson Summary

This lesson is designed to help students in sequencing and building models as well as help them understand the life cycle of an apple.

## Suggested Sequence of Events:

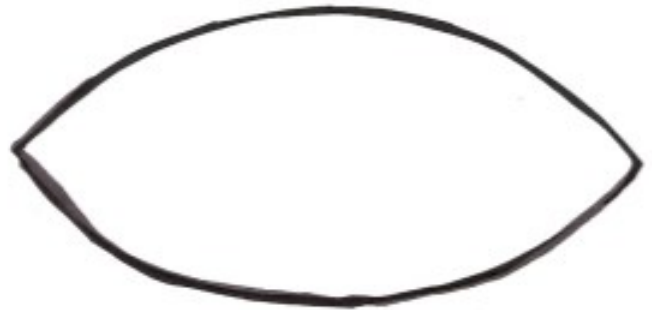
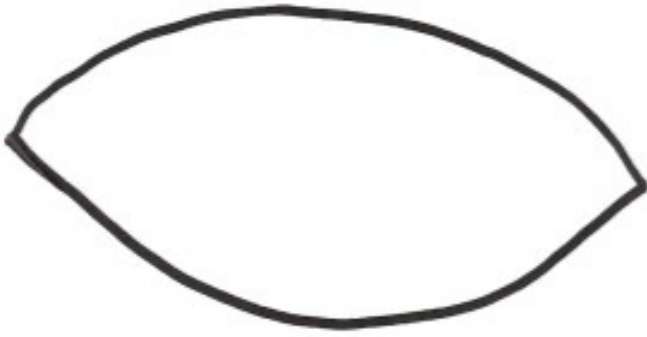
1. Set Up: Print each template onto colored construction paper: seed (brown), tree (green), blossom (pink), bee (yellow), little apple (green). Cut out the shapes and then punch a hole on opposite sides of each template, except the seed which only needs one hole. Cut short strands of yarn-student will need five pieces each.
2. Read "[Apples to Oregon](#)" by Deborah Hopkinson to capture student interest.
3. Read through [AITC Apple Ag Mag](#) to learn about apples. Interactive online versions can be found on our website.
4. Complete the activity following the procedures:
  - Have students staple their 2 red plates together around 2/3 of the edge. Leave the other 1/3 open.
  - Have them tape one end of a piece of yarn to the inside of the stapled paper plates and extend the yarn out of the opening.
  - Add a stem to the red paper plates to make them look like an apple. Place this aside for now.
  - Ask students what shape is the start of a plant (seed). Then ask them what a seed grows into (tree). Use the yarn to tie these two shapes together. Repeat this until you get the chain completed.
  - Tuck the shapes into the red apple. Starting with the seed, slowly pull the shapes out of the apple and tell the story of how the apple grows.
5. Whole class discussion and reflection of activity. Pair students together and have them share their apple chain with their partner, telling the story of the apple life cycle!

# TEACHER RESOURCES

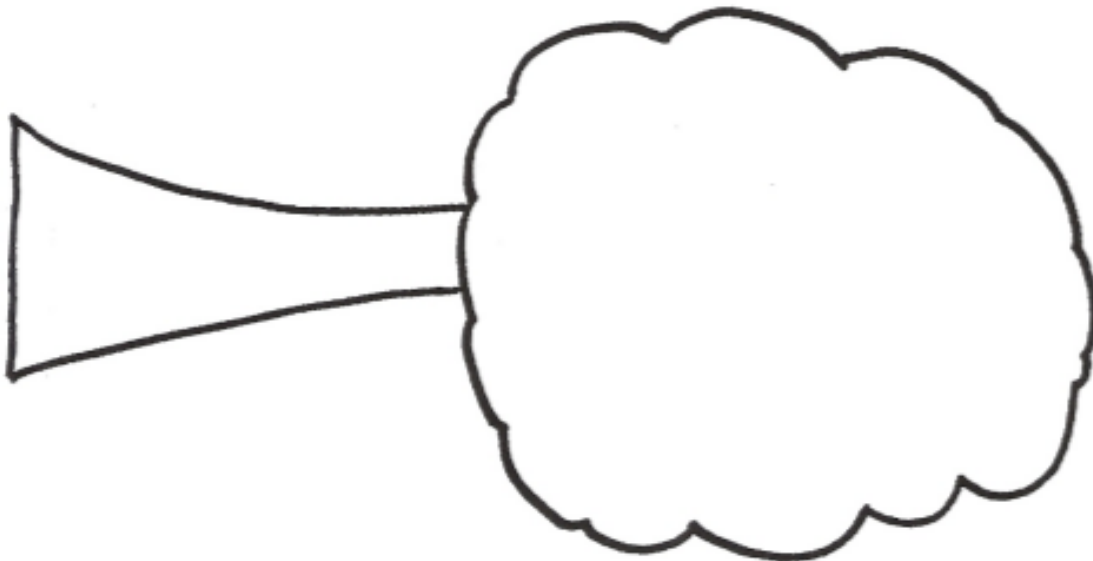
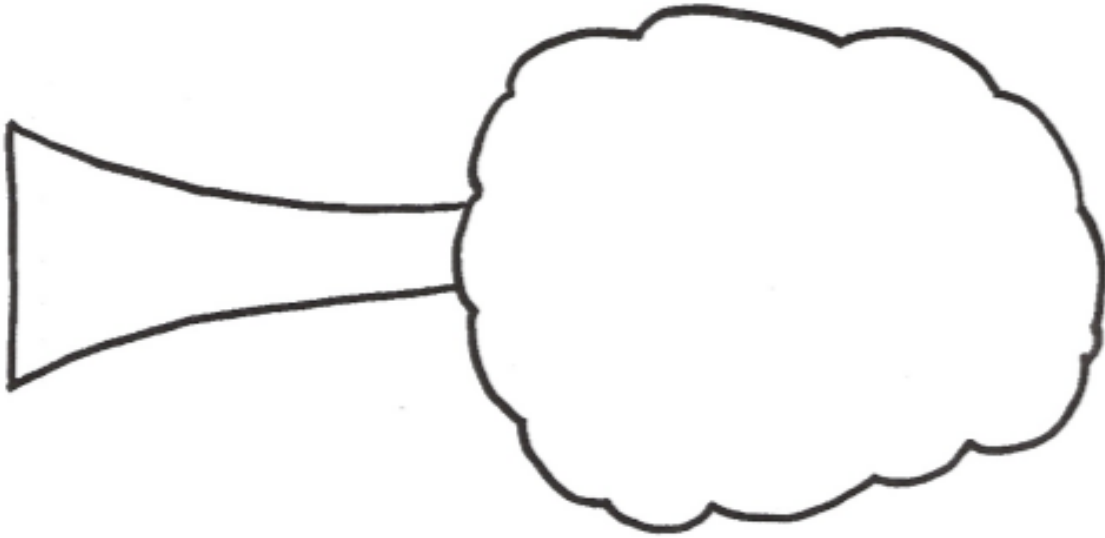
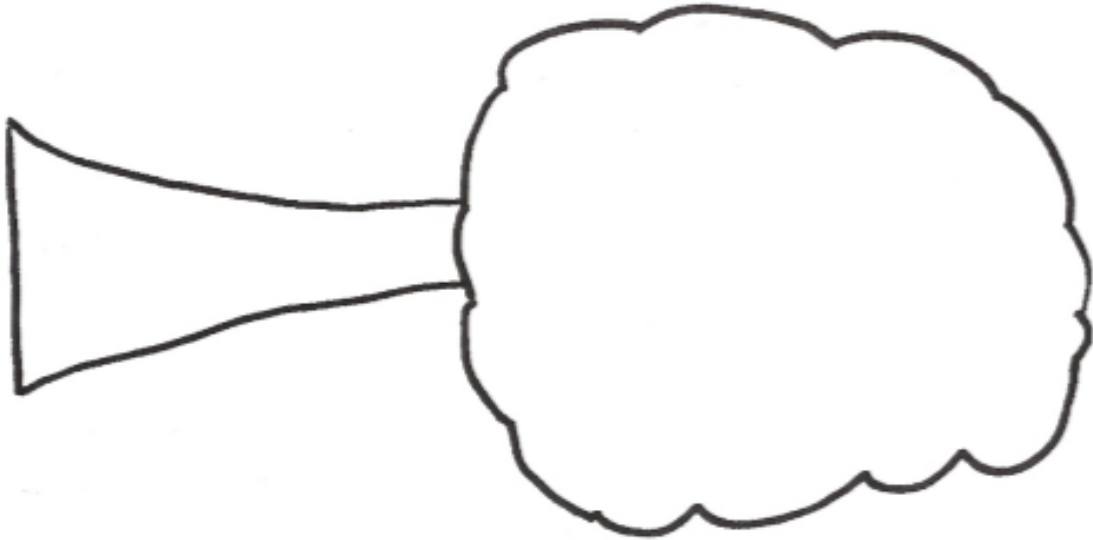
## Extension Ideas:

- Read “[From Seed to Apple](#)” by Anita Ganeri. Look at the pictures and have students analyze the images.
- Have students label each shape on their apple chain.
- Have students create a comic strip showing the apple life cycle.
- Have students tell a story from the apple’s perspective.
- Show a labeled diagram of an apple and/or apple tree.
- Introduce or teach about photosynthesis.
- Scientific Inquiry: Have students think more deeply about apple varieties. Do different types of apples taste different?
- Watch a time lapse video of an apple growing.
- Watch a video from a local farmer discussing apple growth and harvest.
- Take a field trip to an orchard and pick your own apples.
- Invite an apple farmer into the classroom.
- Have students research each step and write a paragraph explaining what happens at each phase. How long does each phase take?
- Measure and adjust the lengths of the yarn in between each shape to represent how long each phase takes.
- Take a closer look at bees and other pollinators. What is pollination? Why is it important for apples?
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!

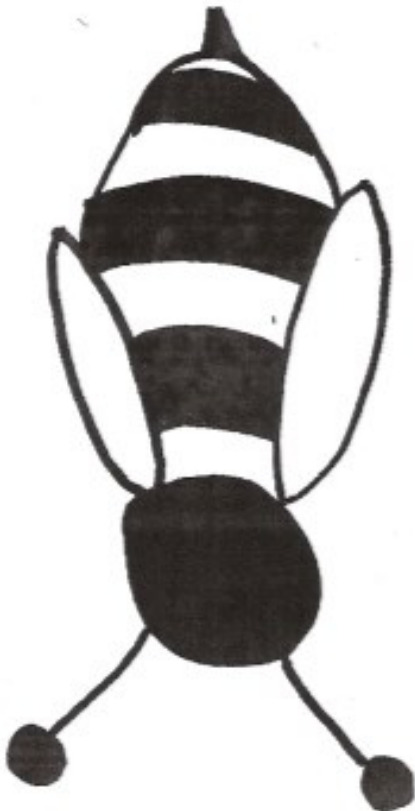


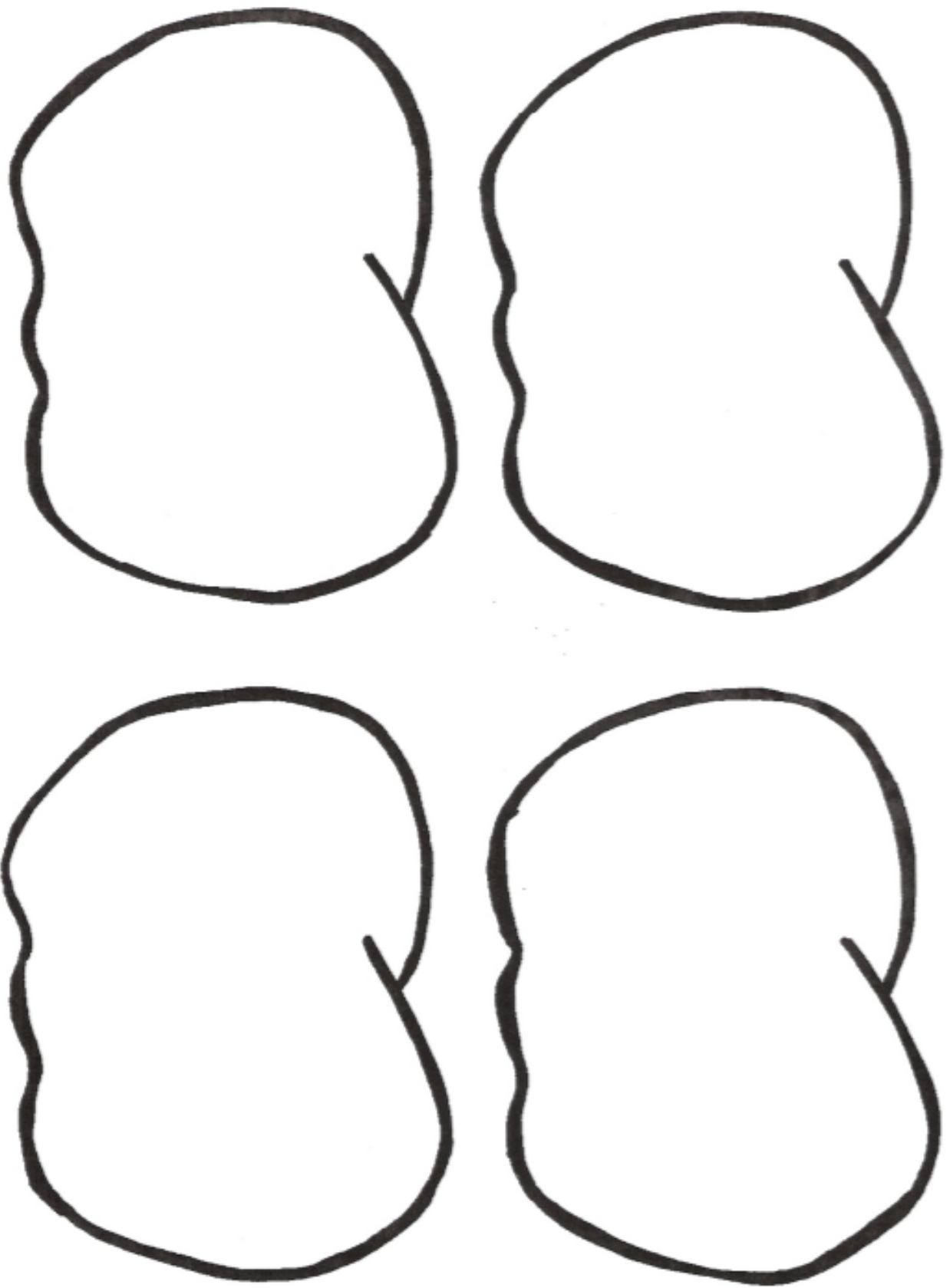














Science



Literacy

# 3-D PUMPKIN

## Grade Level

3-5

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will learn more about growing pumpkins in Illinois.

## Materials Needed

- Orange construction paper
- Green construction paper
- Hole punch
- 2 paper fasteners for each pumpkin
- Scissors

## Standards

### Common Core

CCSS.ELA-Literacy:  
RI.3.1; RI.3.9; W.3.2;  
W.3.7

SS.EC.1.3; SS.IS.4.3-5

### NGSS

K-LS1-1; 3-LS1-1; 3-  
LS4-3

## Lesson Summary

This lesson is designed to help students learn more about pumpkins while creating a visual display of a mini pumpkin.

## Suggested Sequence of Events:

1. Set Up: Cut the orange paper lengthwise into 3/4 inch strips. Cut the green construction paper into 1 inch x 1 inch squares. Stack the orange strips and hole punch both ends of the stack and then punch a hole through the center of the green squares. Each student will get four orange strips and one green square.
2. Read [“Too Many Pumpkins”](#) by Linda White to capture student interest.
3. Read through [AITC Pumpkin Ag Mag](#) to learn about pumpkins. Interactive online versions can be found on our website.
4. Complete the activity following the procedures:
  - Identify four pumpkin facts from the Ag Mag and write a fact on each of their strips of orange paper.
  - Have students stack their orange strips, all facing the same direction.
  - Place a brad fastener through the center hole of the green square and then through one end of the stack of the orange strips. Make sure the words are facing outward. Spread the wings of the fastener to keep it in place.
  - Grab a second fastener and bend each end of the paper strips down, sliding the fastener through the punched hole at both ends. When all eight ends are attached, spread the fastener inside your pumpkin.
  - Last, have students spread out the paper strips to form a 3D pumpkin!
5. Whole class discussion and reflection of activity. Pair students together and have them share their pumpkin facts with their partner.



# TEACHER RESOURCES

## Extension Ideas:

- Read “[Pick a Pumpkin](#)” by Patricia Toht. Look at the pictures and have students analyze the images.
- Have students write three facts about pumpkins and one lie on their orange strips and have their classmates figure out which is the lie.
- Have students create a comic strip including pumpkin facts.
- Have students tell a story from the pumpkin’s perspective.
- Introduce or teach about photosynthesis.
- Watch a time lapse video of a pumpkin growing.
- Watch a video from a local farmer discussing pumpkin growth and harvest.
- Take a field trip to a pumpkin patch and pick your own pumpkins.
- Take a closer look at squash bees and other pollinators. What is pollination? Why is it important for pumpkins?
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!



Illinois is the #1 state for growing pumpkins.

Morton, Illinois is the Pumpkin Capital of the World.

Pumpkin growth starts inside a flower.



Math



Literacy

# PUMPKIN PIE IN-A-BAG

## Grade Level

K-3

## Length of Lesson

45 minutes

## Objective

By the end of this activity, students will have a better understanding of where their food comes from.

## Materials Needed

- Scissors
- 1 gallon Ziploc® freezer bag
- 1 teaspoon ground cinnamon
- 1/2 teaspoon pumpkin pie spice OR ground ginger
- 2 packages (4 oz serving size) instant vanilla pudding mix
- 1 can (15 oz) 100% pure pumpkin
- 2 2/3 cups cold milk
- Graham cracker crumbs
- 1 can whipped topping
- Spoons (1 per student)
- 3 oz dixie cups (1 per student)

\*Recipe makes 26 servings

## Standards

### Common Core

CCSS.ELA-Literacy.RI.3.1;  
RI. 3.2

CCSS.Math.Content.3.MD.2

### NGSS.

2-PS1-1; 2-PS1-3

## Lesson Summary

This lesson is designed to help students have a better understanding of where their food comes from. It will also show students the connection of math and cooking while introducing the importance of nutrition.

## Suggested Sequence of Events:

1. Read "[From Seed to Pumpkin](#)" by Wendy Pfeffer to capture student interest and to show them how pumpkins grow.
2. Read through [AITC Pumpkin Ag Mag](#) to learn more about pumpkins. Interactive online versions can be found on our website.
3. Complete the activity following the procedures:
  - Combine the milk and the instant pudding in the Ziploc bag.
  - Remove the air from the bag and seal it.
  - Squeeze and knead the bag for about 1 minute, until the milk and pudding are combined.
  - Open the bag and add the pumpkin, cinnamon, and pumpkin pie spice.
  - Remove the air and seal the bag again.
  - Squeeze and knead the bag again, this time for about 2 minutes until the spices and pumpkin are well blended.
  - Place 1/2 tablespoon of graham cracker crumbs in the bottom of the dixie cups.
  - Cut the corner of the gallon bag and squeeze the pie filling into the cups.
  - Garnish with whipped topping and add a spoon.
  - Enjoy!
  - Discuss pumpkin production and watch [Pumpkins, Gourds, & More! \(Harry Kindergarten goes to the pumpkin patch!\)](#) while students are eating.
5. Whole class discussion and reflection of activity. Have students discuss whether or not they liked their pumpkin pie. Then, encourage students to share their pumpkin life cycles with their group!

# TEACHER RESOURCES

## Extension Ideas:

- Ask students if they have ever eaten pumpkin pie before. Was it store bought or homemade? Have them compare and contrast that pumpkin pie with what the pumpkin “pie” you made today.
- Take a closer look at canned pumpkin production.
  - Watch this video about Libby’s Pumpkin in Morton Illinois to see how pumpkin goes from farm to can: [How Libby’s Canned Pumpkin Is Made | TODAY](#)
- Bring in different colored pumpkins or gourds to explain varieties to your students.
- Have students tell a story from a pumpkin’s perspective.
- Show a labeled diagram of a pumpkin and/or pumpkin vine. Talk about which part is used for pumpkin pie filling. What are the other parts used for?
- Look into other recipes that use pumpkin pie filling, pumpkin spices, and other pumpkin ingredients.
- Watch a time lapse video of a pumpkin growing.
  - Here is a video of a giant pumpkin growing: [Giant Pumpkin Time Lapse.wmv](#)
- Watch a video from a local farmer discussing pumpkin growth and harvest
- Take a field trip to a patch and pick your own pumpkins.
- Invite an pumpkin farmer into the classroom.
- For older students, split them into groups of 4-5 and have them complete this activity with their group. (Make sure to divide measurements by 4-5 to get the correct tasting batch for that size of group!)
- Take it a step further and have certain groups change the measurement of different ingredients and taste test how that affects the pie.
- Make playing cards of the life cycle of a pumpkin and have students race to put it in order.
- Complete our “Pumpkin Chain” activity to learn more about the life cycle of a pumpkin.
- Go to [agintheclassroom.org](#) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!

## Media Resources:

Use this video to introduce or demonstrate this activity: <http://iaitc.co/pieinabag>



# THE BEES KNEES AND MORE!

**Grade Level**

3-6

**Length of Lesson**

45 minutes

**Objective**

By the end of this lesson, students will know the different parts that make up a honeybee.

**Materials Needed**

- Copies of the labeled bee diagram
- Copies of anatomy flashcards\*
- Copies of the student worksheet

**Standards**Common Core

CCSS.ELA-Literacy.RI.3-8.4; SL.3.6

NGSS

2-LS2-2; 4-LS1-2; MS-LS1-4

**Lesson Summary**

This lesson is designed to help students learn the different parts of a honeybee. Students can use the hexagon-shaped flashcards to deepen their understanding and learn more about the functionality of each part!

\*If you want the flashcards printed so that the information is on the back side of the matching anatomical part, make sure your settings are changed to print double-sided, flipping on the long edge.

**Suggested Sequence of Events:**

1. Set Up: Print enough flashcards to have a few classroom sets. Print and cut the flashcards out and laminate to last longer!
2. Read through the [IAITC Pollinator Ag Mag](#) to learn more about pollination and other pollinators! Interactive online versions can be found on our website.
3. Complete the activity following the procedures:
  - Read "[Honeybee: The Busy Life of Apis Mellifera](#)" by Candace Fleming to snag student interest and introduce students to honeybee life.
  - Give each student a labeled honeybee diagram. As a class, read through the names of each of the parts. Talk about their location, structure, function, and uses.
  - Have students use the flashcards to deepen their understanding about the function and use of each part. Students can work individually or with a partner.
  - When students are ready, test their knowledge! Give each student a copy of the blank honeybee diagram and have them use the word bank to fill in the blank lines.
    - Give students crayons or colored pencils to color their honeybee when they finish!
4. Whole class discussion and reflection of activity. Ideas for discussion starters: How are the parts of a honeybee important for their survival? Why is important/helpful that honeybees have hair; what does this help with?



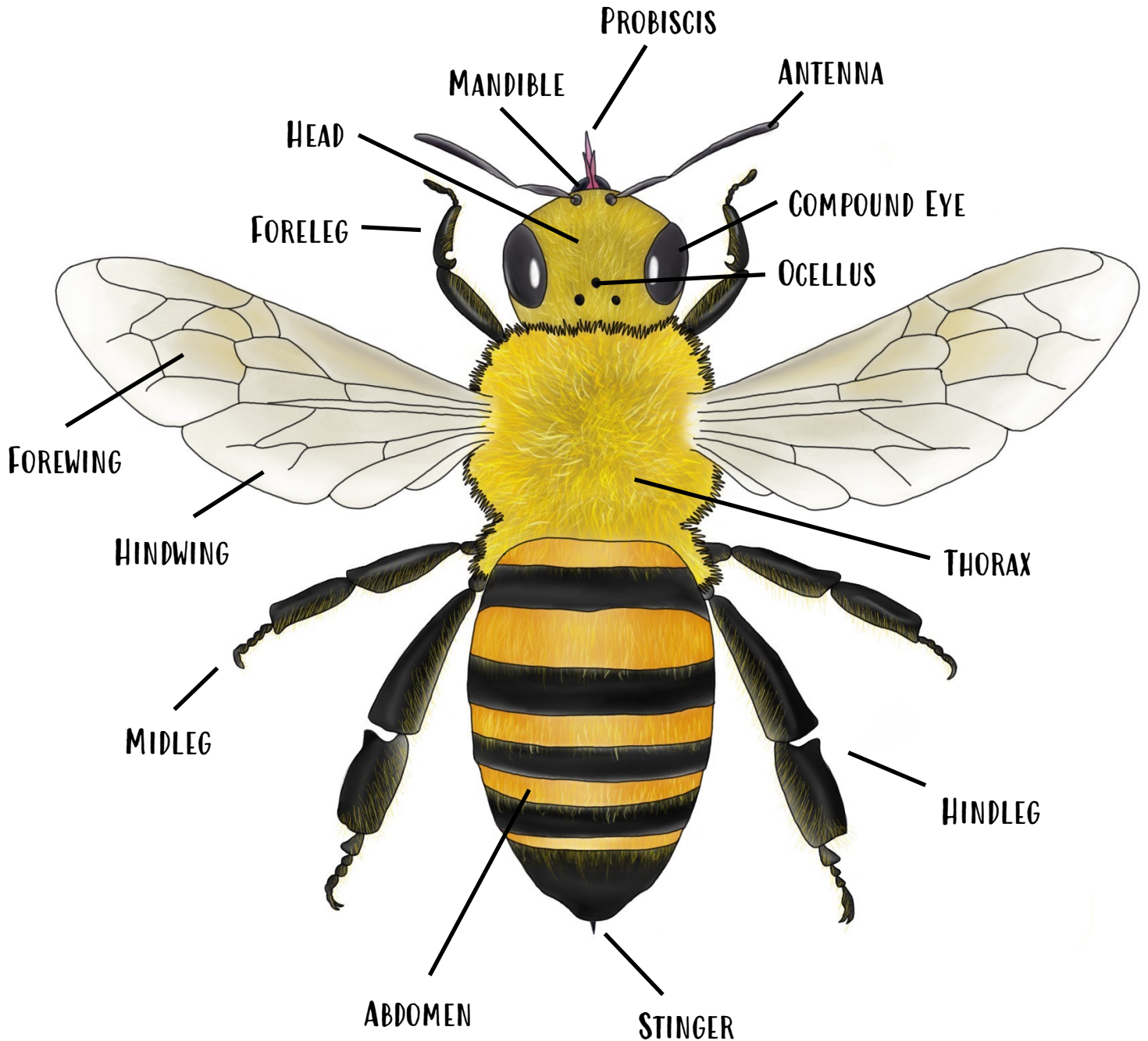
# TEACHER RESOURCES

## Extension Ideas:

- After reading “Honeybee: The Secret Life of *Apis Malifera*” by Candace Flemming, have students look at the pictures and analyze the images.
- Have multiple books around for students to read and learn more about honeybees and other types of bees! Here are some of our favorites:
  - [Give Bees a Chance](#) by Bethany Barton
  - [The Bee Book](#) by Charlotte Milner
  - [The Honey Makers](#) by Gail Gibbons
  - [Flight of the Honey Bee](#) by Raymond Huber
  - [Bee Dance](#) by Rick Chrustowski
  - [Please Please the Bees](#) by Gerald Kelley
- Use the IAITC Pollinator Ag Mag and complete the Pollinator Ag-Venture worksheet to strengthen non-fiction literacy skills.
- Watch the IAITC “Bee School” videos to learn more about bee keeping. These can be accessed on the Illinois Agriculture in the Classroom YouTube Channel.
- Learn about how honey is made in the hive and then harvested. Bring in different types of honey for students to taste test.
- Compare the anatomy of a honeybee to other types of bees and insects. What are the similarities and differences?
- Have students research other pollinators (in your state, in the U.S. and/or around the world) and share their information with the class.
- Learn about native wildflowers that are beneficial to pollinators.
- Learn about the structure of flowers and the process of pollination.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!



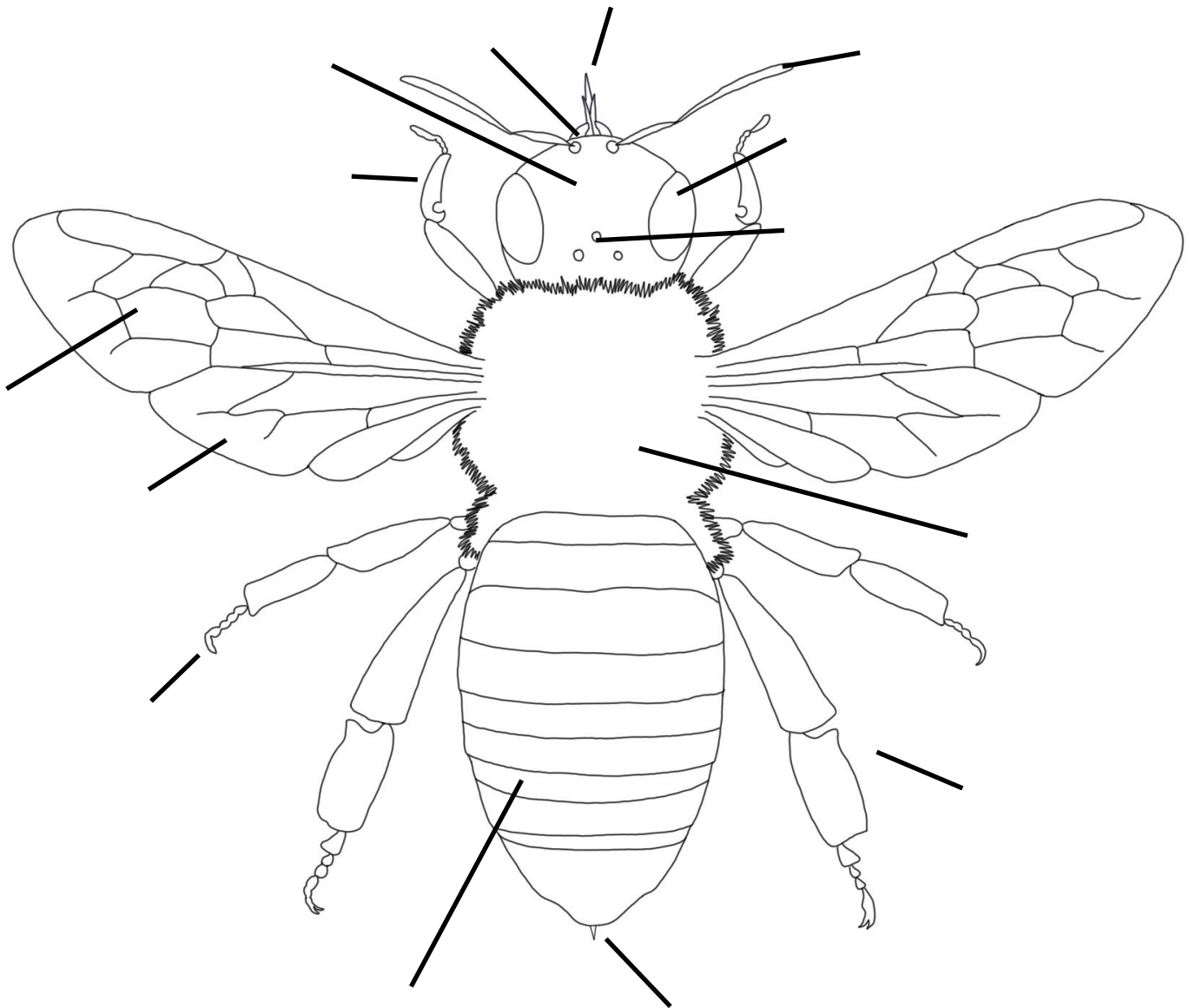
# THE BEES KNEES AND MORE!





# THE BEES KNEES AND MORE!

## STUDENT WORKSHEET



### WORD BANK

Ocellus

Thorax

Foreleg

Mandible

Forewing

Hindwing

Abdomen

Head

Midleg

Hindleg

Proboscis

Stinger

Antenna

Compound Eye



# ANATOMY FLASHCARDS: A

## HEAD

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- Front segment of the bee
- Contains important sensory parts for sight, smell, taste, and touch

## ANTENNAE

---

- Found on the forehead
- Used for detecting scent since bees don't have noses!
- Also used for feeling around in the dark hive

## MANDIBLES

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- The powerful jaws of the bee
- Used for:
  - Moving, cutting, and shaping the wax to build the honeycomb
  - Grooming
  - Fighting off predators
  - Holding on to surfaces

## OCELLI

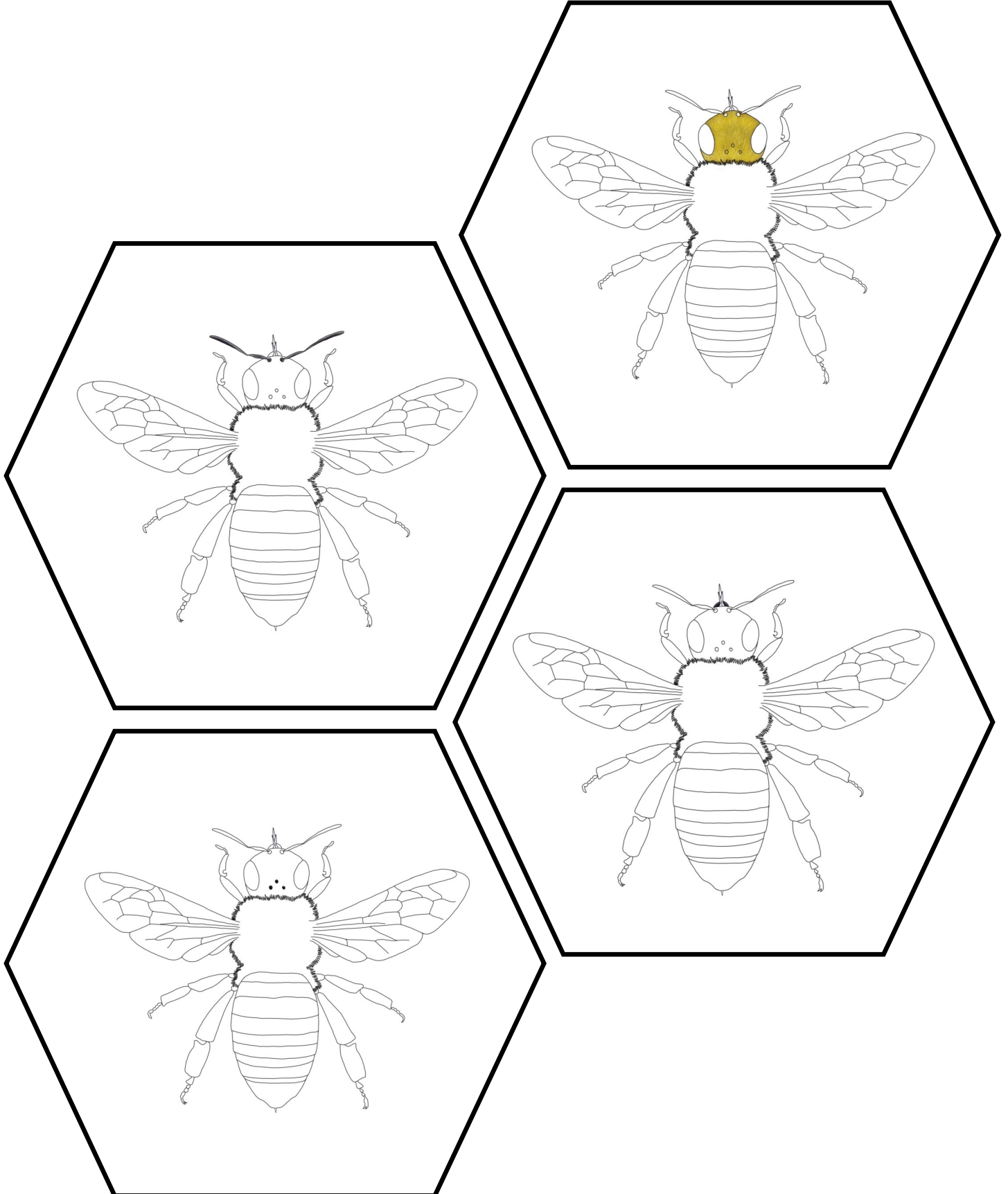
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- 3 dots on the top of the head, found in a triangle pattern
- Used for detecting brightness and intensity of light



Science

# ANATOMY FLASHCARDS: A







# ANATOMY FLASHCARDS: B

## COMPOUND EYES

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- Two large eyes that take up most of the head
- Have over 3,000 lenses that allow the bee to see ultraviolet light — this helps them see which flowers are full of nectar!

## THORAX

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- Torso of the bee, the segment of the body between the head and abdomen
- All wings and legs attached to the thorax
- Black in color and is covered in hair which helps collect pollen

## PROBISCIS

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- Long, straw-like tongue
- Used for:
  - Sucking up nectar from flowers
  - Transferring and forming beeswax in the hive to build the honeycomb
  - Transferring nectar from bee to bee, a part of the process in making honey!

## FORELEGS

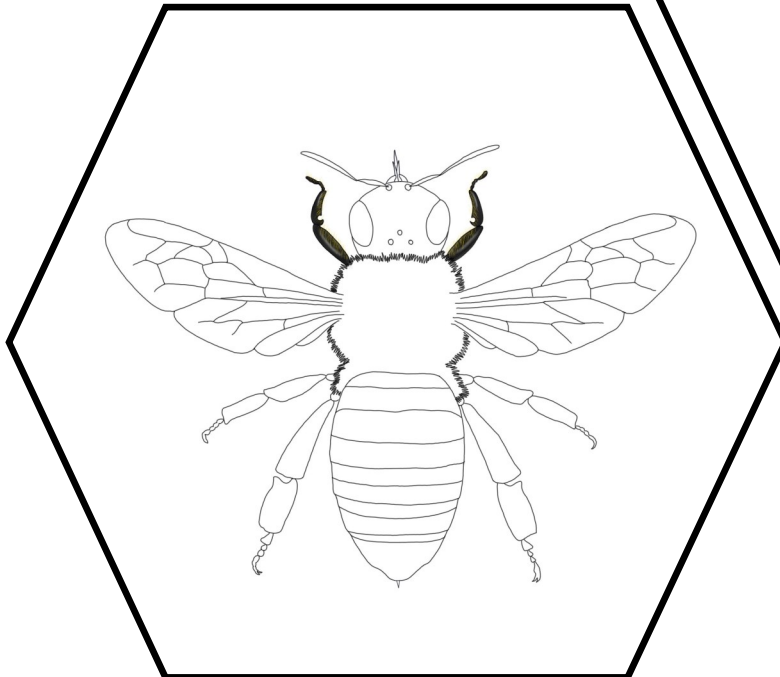
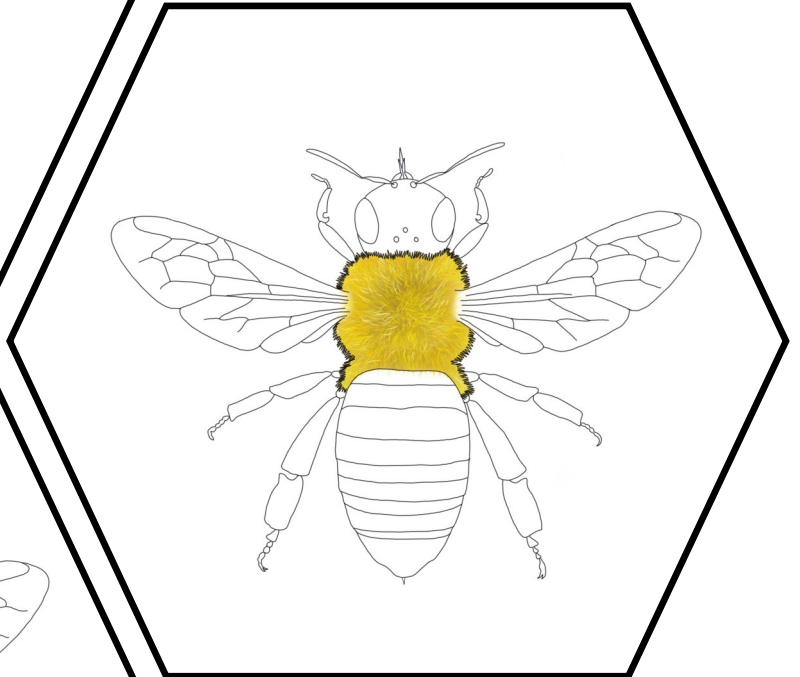
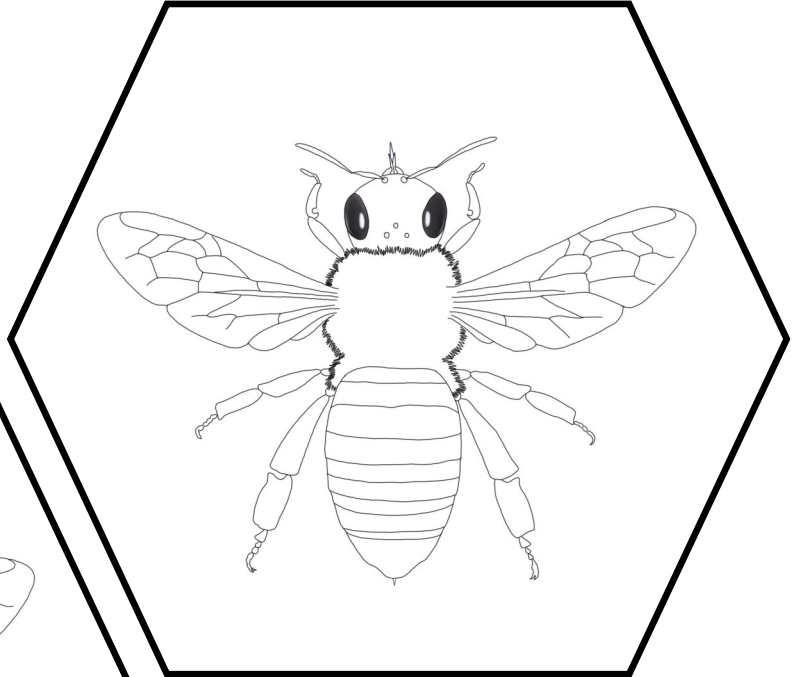
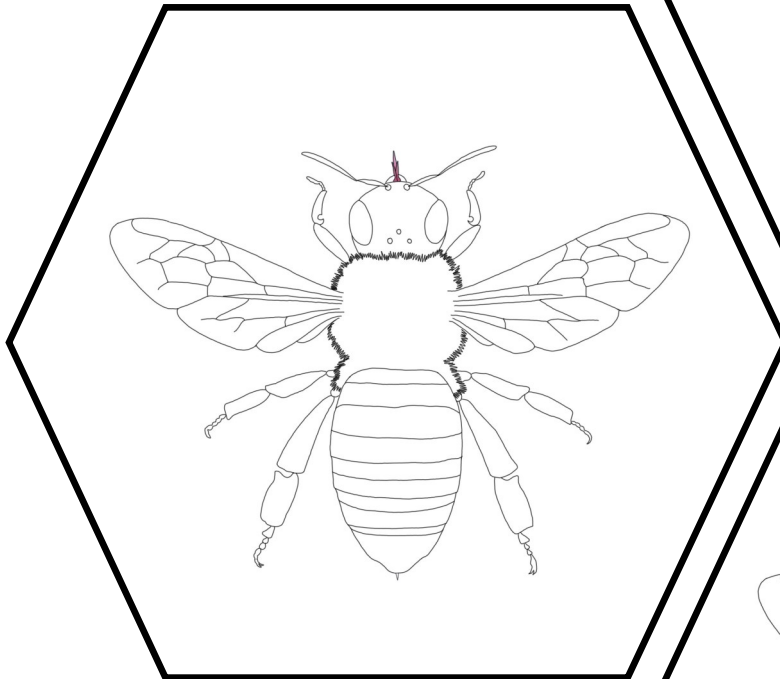
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- Attached to the thorax near the head
- Used for:
  - Dusting off their head and antennae from dust and pollen
  - Moving around flower parts to get to the nectar
  - Brushing pollen caught in the hair of the mid legs into “pollen baskets” found on the hind legs



Science

# ANATOMY FLASHCARDS: B





# ANATOMY FLASHCARDS: C

## WINGS

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- 2 pairs attached to the thorax
- Forewings are larger and closer to the head, hindwings smaller and behind the forewings
- Beat 230-250 times per second!
- Can fly between 12-20 mph (miles per hour)

## MID LEGS

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- Attached to the middle of the thorax
- Covered in little hairs that collect pollen
- Used for walking

## HIND LEGS

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- Attached to the back of the thorax, near the abdomen
- Used for movement and walking
- Contain “pollen baskets”, special hairs on the outside of the leg that are used to store pollen

## ABDOMEN

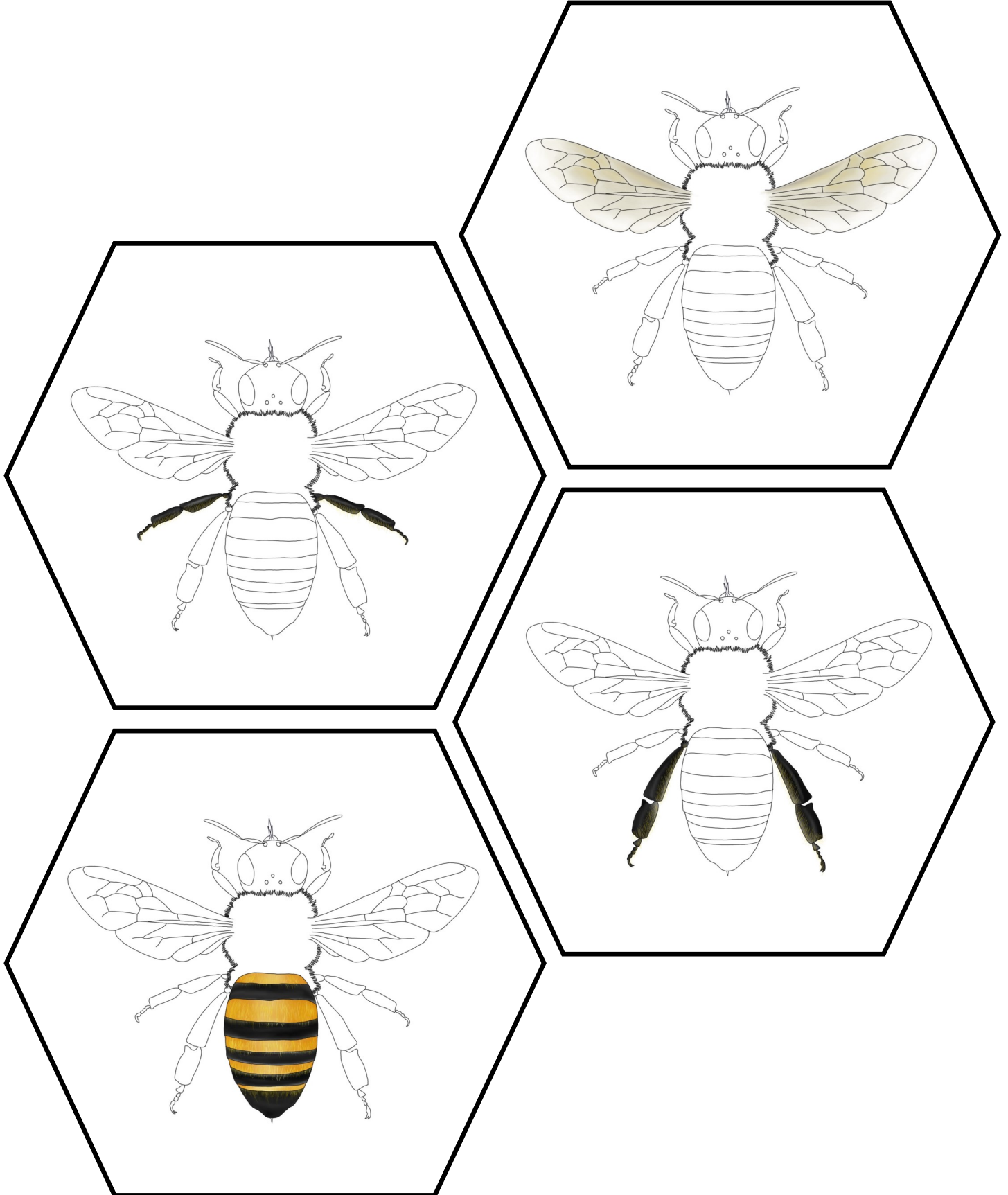
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- Largest segment of the body, found at the back of the bee
- Hides the stinger — only female bees can sting. Stinging leads to death so a honeybee will only sting if she or her hive are threatened.



Science

# ANATOMY FLASHCARDS: C





Science



Literacy

# THROW & GROW

## Grade Level

2-5

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will be able to explain the importance of pollinators.

## Materials Needed

- Air dry clay
- Compost
- Wildflower seeds (native to your area)
- Small spray bottle with water

## Standards

### Common Core

CCSS.ELA-Literacy.RI.4.7; SL.4.1

### NGSS

2-LS2-1; 3-LS1-1; 3-LS3; 3-LS4; 5-LS2-1

## Lesson Summary

This lesson is a fun, hands-on activity designed to teach students more about the importance of pollinators. Students will also learn about seed germination and plant growth as you watch your flowers grow!

## Suggested Sequence of Events:

1. Read "[Up in the Garden and Down in the Dirt](#)" by Kate Messner to snag student interest!
2. Read through the [IL AITC Pollinator Ag Mag](#) to learn about pollination. Interactive online versions can be found on our website.
3. Complete the activity following the procedures:
  - Have each student pull off a piece of clay and spread it out to be large enough to pour the compost on it.
  - Have them pour a pinch of compost on the clay and then pour the seeds on top of it.
  - Then, have students spray a small amount of water (one or two sprays) on their seeds.
  - Allow each student to fold together and knead the mixture until the mixture is thoroughly mixed together.
  - Have them roll it into a ball and bring it out to dry in the sun.
  - Now it is time to "throw and grow." Have them throw their seeds into their yard and wait for them to grow.
5. Whole class discussion and reflection of activity.

# TEACHER RESOURCES

## Background Information:

Spring is the best time to toss your throw and grows into your yard or an approved location at your school. Try to time it before a heavy rainfall in order to help the seeds germinate.

The clay helps hold the soil and seeds together. Once thrown, the clay will hold the compost and seeds together so the seeds have a nutritious home to germinate. Over time, the seeds will root into the ground and weather conditions will break down the clay.

## Extension Ideas:

- Read "[Our School Garden](#)" by Rick Swann and talk about the importance of flower gardens. Talk with your principal and maintenance staff and see if there's an approved location on the school grounds where you can grow a pollinator garden.
  - Have students measure, design, and build the garden before you complete this activity.
  - If there is no approved location, have students 'throw' their "Throw & Grows" into a flower pot and set the pots by your classroom windows.
- Have students draw or take pictures of their observations on their plant growth.
- Have students measure the growth of their plants and record the data on a graph.
- Have students research a native Illinois flower and its usual pollinators.
  - Students can write a paper about their findings.
- Have students think more deeply about the role each material played in their throw and go; What is compost used for? What would happen if we didn't water it? How does a seed become a plant?
- Learn about the difference of "soil" vs. "dirt."
- Learn about different pollinators!
  - Invite a beekeeper in to talk about bees.
  - Get involved and learn about the [Illinois Monarch Project](https://www.ilfb.org/resources/ifb-in-action/illinois-monarch-project-provides-resources/). Available at <https://www.ilfb.org/resources/ifb-in-action/illinois-monarch-project-provides-resources/>
  - Watch this [video](https://www.youtube.com/watch?v=_QYvaiozsFc) from the Illinois Farm Bureau all about pollinator habitats. Available at [https://www.youtube.com/watch?v=\\_QYvaiozsFc](https://www.youtube.com/watch?v=_QYvaiozsFc)
- Have students write a paragraph about the importance of pollinators.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!





# BEANIE BABY

**Grade Level**

K-7

**Length of Lesson**

45 minutes

**Objective**

By the end of this lesson, students will have a better understanding of the process of seed germination.

**Materials Needed**

- Jewelry size resealable baggies (found in craft stores)
- Crystal Soil (order from Flinn Scientific at 800-452-1261)
- Hole Punch
- Water
- Measuring Spoons
- Soybeans
- Yarn
- Copies of student worksheet

**Standards**Common Core

CCSS.ELA-Literacy.RI.4.3; RI.4.4; RI.4.5; RF.4.3a

Social Studies

SS.EC.1.4; SS.EC.2.4; SS.EC.FL.1.4; SS.G.2.4; SS.G.3.4

NGSS

5-PS1-4

**Lesson Summary**

This lesson is designed to give students a hands-on activity that shows how seeds germinate. Students will create a “beanie baby” which allows them to observe not only the process of seed germination, but also the environment a seed needs for growth.

**Suggested Sequence of Events:**

1. Set Up: Pre-cut yarn into pieces long enough to tie as a necklace. Hole punch baggies above the seal.
2. Read [“Full of Beans: Henry Ford Grows a Car”](#) by Peggy Thomas to capture student interest. Ask if they know what other things we use soybeans for/in.
3. Read through [AITC Soybean Ag Mag](#) to learn about soybeans. Interactive online versions can be found on our website.
4. Pre-Activity Discussion: Hand out the student worksheet and ask them what a seed needs to start growing. Have them work individually to fill out the “Think” column to answer that question. Then have students pair up and share their ideas. They can add new information in the “Share” column. Then, as a whole class, have students share their ideas from the “Think” column. Go through the list one at a time and discuss whether a seed actually needs that to begin growing. Cross off the ones that are not necessary. Once your class comes to a final consensus, have each student write the class list in the “Share” column.
5. Complete the activity following the procedures:
  - Give each student a hole-punched baggie.
  - Have each student put 1/4 teaspoon of Crystal Soil into their baggie.
  - Add 2-3 soybeans into the baggie with the Crystal Soil.
  - Then add 1-2 tablespoons of water into their baggie.
  - Have them seal their baggies firmly so that they won’t leak.
  - Then have them insert one end of yarn through the hole of the baggie and tie the ends of the yarn in a knot to make a necklace.
  - Tell them to wear the beanie baby around their neck, tucked under their shirts (warm, dark place). Have them check their beanie babies several times a day to observe germination and growth!
6. Whole class discussion and reflection of activity.

# TEACHER RESOURCES

## Extension Ideas:

- Read Dr. Seuss' "[Oh Say Can You Seed](#)" by Bonnie Worth and discuss the different parts of plants. Have students record unknown words as you read and go back to look up definitions.
- Have students create a comic strip showing the process of germination.
- Have students write a story from the soybeans perspective.
- Show a labeled diagram of a soybean plant.
- **STEM:** Have students build and label a model using recyclable materials.
- Introduce or teach about photosynthesis.
- **Scientific Inquiry:** Have students think more deeply about plant growth and create their own question, hypothesis, and experiment to test! Will soybeans grow faster in Mountain Dew, Coffee, or water? Does the amount of light affect the growth of the plant? Do different fertilizers, potting soils, temperature, etc. affect plant growth differently?
  - Have students use the "Student Inquiry Sheet" to test their variables.
- Watch a time lapse video of a soybean growing.
- Watch a video from a local farmer discussing soybean growth and harvest.
- Take a field trip to a farm.
- Invite a soybean farmer into the classroom.
- Watch the TEDx Talk "[Sitting on Soybeans: Building the Bio-Based Automobile](#)" presented by Debbie Mielewski. Discuss the idea of inventions and creativity. Discuss the broad possibilities of careers in Agriculture. Discuss how Debbie is a female in a stereotypically "male" career and how she is breaking that stigma.
- Research the "accidental" invention of the Crystal Soil used in the activity (which happened in Peoria, IL)
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!





# BEANIE BABY

## STUDENT WORKSHEET

### Background Information

Soybeans are small, round seeds, each with a tiny hilum and made up of three basic parts. Each soybean has a seed coat, cotyledon, and the embryo. Each soybean plant generally reaches a height of 1 m (3.3 feet) and takes 80-120 days from sowing to harvesting. So how does a seed turn into a plant? Let's find out!

What does a seed need to start growing?

<u>Think</u>	<u>Pair</u>	<u>Share</u>
--------------	-------------	--------------

### Materials

- 1 jewelry size resealable baggie
- Measuring spoons
- 1/4 teaspoon of Crystal Soil
- 1-2 tablespoons of water
- 2 soybeans
- 1 piece of yarn

### Procedures

1. Open your jewelry-sized baggie.
2. Measure 1/4 teaspoon of the Crystal Soil and carefully dump it into your baggie.
3. Gently push your 2 soybeans into the Crystal Soil.
4. Carefully measure 1-2 tablespoons of water and pour into your baggie.
5. Seal your baggie firmly and make sure there are no leaks!
6. Insert one end of your yarn piece through the hole in the baggie and tie the ends of the yarn in a knot.
7. Wear your beanie baby like a necklace and tuck it into your shirt (it's a little chilly at first!).
8. Check on your beanie baby several times a day to observe germination and record its growth!

### Make a Prediction!

How long will it take for your seed to germinate?



# BEANIE BABY

## STUDENT WORKSHEET

### Vocabulary

**Cotyledon:** a seed leaf stored in a seed which are the first leaves the plant will have.

**Embryo:** part of a seed that develops into a new plant, including the stem, leaves, and roots.

**Germination:** the phase of plant growth when the seed begins to sprout.

**Hilum:** the scar on a seed marking the point of attachment to its seed vessel (the brown spot).

**Radicle:** the lower part of the axis of the embryo, the primary root.

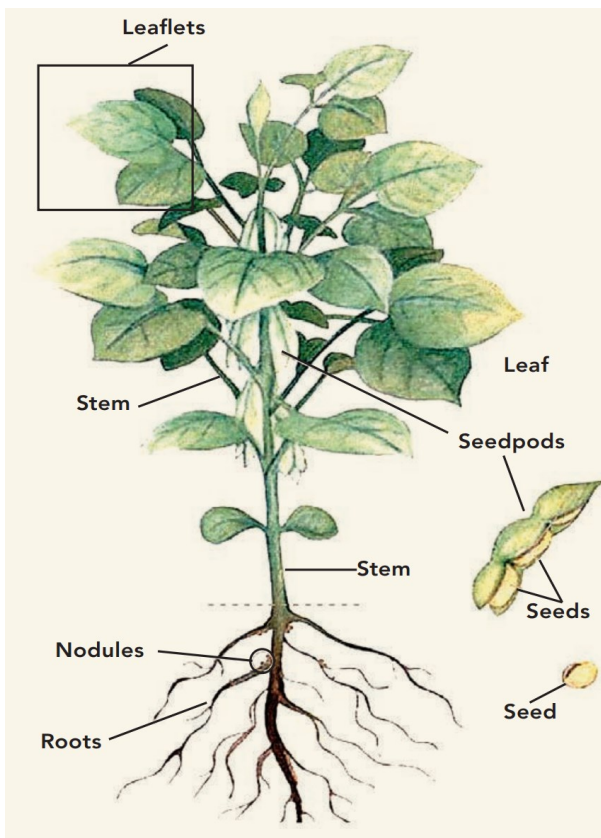
**Seed Coat:** the outside cover that protects the seed.

**Seed Pod:** a structure that holds seeds. Each pod typically holds 3-4 beans.

**Soybean Oil:** a pale yellow oil derived from soybeans by solvent extraction. Used as a food and in the manufacture of soap, candles, inks, paints, varnishes, etc.

**Stem:** the main stalk of the plant.

**Taproot:** a main root descending downward from the radicle and giving off small lateral roots.



### Observe, measure, record!

Use the table below to record your data.

Day	Measurement in cm	Observations



Science



Literacy

# PACKING PEANUTS

## Grade Level

3-6

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will have a better understanding of renewable, non-renewable, and biodegradable resources.

## Materials Needed

- [Cornstarch packing peanuts](#) (available from [uline.com](#))
- Styrofoam packing peanuts
- Clear 8-12 oz. cups (2 per group)
- Water (2 cups per group)
- Copies of student worksheet
- Copies of QR codes sheet (optional)

## Standards

### Common Core

CCSS.ELA-Literacy.W.3.1;  
W.3.7

### NGSS

K-2.ETS1-1; K-2-ETS1-2;  
2-PS1-1; 2-PS1-3

## Lesson Summary

This lesson is a hands-on activity that challenges students to strengthen inquiry skills as they use the scientific method to explore materials we use for every day objects. This also helps students critically think about renewable vs. non-renewable resources.

\*\*For younger grades, students will need to have already learned concepts such as hypothesis (and/or the scientific method), biodegradable, renewable, and non-renewable resources.

## Suggested Sequence of Events:

1. Set Up: Each group will need two clear cups, one half-way filled with corn packing peanuts, and the other half-way filled with Styrofoam packing peanuts. Have students label their cups "Packing Peanut A" and "Packing Peanut B." Each group will also need at least two cups with equal amounts of water in them.
2. Read through the [IAITC Corn Ag Mag](#) to learn about corn. Interactive online versions can be found on our website.
3. Read "[Corn](#)" by Gail Gibbons to snag student interest.
4. Complete the activity following the procedures:
  - Pass out the student worksheets and talk about the words "renewable" and "non-renewable." Have them brainstorm and list what resources are renewable/non-renewable. As they are working, pass out their lab materials.
  - As a class, have students share their lists and create one definition of each term to write on the board.
  - Have students work in small groups of two to three and follow the directions on their student sheets that will walk them through their scientific inquiry activity.
  - Once they are finished with their activity and have completed their worksheet, have students clean up their materials.
3. Whole class discussion and reflection of activity. Here are some discussion prompt ideas:
  - Did your understanding of renewable and non-renewable resources change or deepen after completing this activity? If so, how?
  - What do you think about using corn based products for something like packing peanuts? Is this better for the environment?



# TEACHER RESOURCES

## Additional Resources:

To help guide students through the experiment, we have added additional secondary sources that will help deepen and develop their understanding of the term “biodegradable,” facts about corn, and what makes Styrofoam. The articles from the websites can be printed, used as links in Google Classroom (for example) for students to use, or to be used as QR codes if your technology allows.

Observation: [Biodegradable](https://wiki.kidzsearch.com/wiki/Biodegradation) available at <https://wiki.kidzsearch.com/wiki/Biodegradation>.

Hypothesis: [Corn growth](https://youtu.be/iFCdAgeMGOA) available at <https://youtu.be/iFCdAgeMGOA>.

Experiment: [Corn based products](https://youtu.be/5J_ZD_vTRhU) available at [https://youtu.be/5J\\_ZD\\_vTRhU](https://youtu.be/5J_ZD_vTRhU).

Conclusion: [Styrofoam](https://easyscienceforkids.com/styrofoam-polymers/) available at <https://easyscienceforkids.com/styrofoam-polymers/>.

## Background Information:

Unlike Styrofoam packing peanuts, cornstarch packing peanuts are biodegradable and decompose in water, leaving no toxic waste. Corn, being a plant, is a renewable resource that we could use to reduce the amount of non-renewable and non-biodegradable products!

## Extension Ideas:

- Define and discuss the words “biodegradable,” “decompose,” and “toxic waste.” Dig deeper and look at the by-products and wastes from making various materials.
- Brainstorm as a class and make a T-Chart on the board and list renewable and non-renewable resources.
- For older students, have them research what products can be made renewable, but are still primarily made with non-renewable resources. (Ethanol, corn packing peanuts, plastics, etc.)
- Because the peanuts begin to break down in water, the peanuts can be used to construct sculptures and art. Simply “lick and stick.” Have student build structures out of the corn packing peanuts. A little spit goes a long way!
  - Have students think of the word “agriculture.” What is the first thing that comes to mind? Have them build that with their packing peanuts.
  - Give students the title of an upcoming reading assignment or book. What does each student think of when they hear that title? What will the book be about? Have each student construct their idea using the peanuts.
  - For younger students learning the alphabet or numbers, give them a piece of paper with a number or letter on it. Have them “trace” the number or letter with the corn packing peanuts by having them lick and stick them together.
- Learn more about other common corn-based products.
- Invite a corn farmer into the classroom to talk about types of corn, their uses, and what it takes to be a corn farmer.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!





# PACKING PEANUTS

## STUDENT WORKSHEET

Take a few minutes to think about resources that we use daily. Which of those are renewable? Which are non-renewable? Make your list of each type in the boxes below!

Renewable	Non-renewable

Now that you've shared your ideas as a class, write what it means for a resource to be renewable and non-renewable.

### OBSERVATION

Before any scientist begins the experimentation stage of their inquiry, they must make observations of the objects they are using in their experiment! This way, they can use that data to help determine how to complete their experiment and what materials to use. Observe your two types of packing peanuts and record your observations in the table below!

Sound

Color

shape

Texture

Smell

Softness

Packing Peanut A	Packing Peanut B



# PACKING PEANUTS

## STUDENT WORKSHEET

### HYPOTHESIS

We want to figure out which one of these packing peanuts is made from biodegradable materials. Based on your observations and your understanding of the term 'biodegradable,' write your hypothesis in the space below.

---

### EXPERIMENT

You should have two cups of water, with the same amount of water in each cup. Slowly pour one cup of water into the "Packing Peanuts A" cup and the other cup of water into the "Packing Peanuts B" cup. Record your observations in the table below.

Packing Peanut A	Packing Peanut B

### CONCLUSION

Now that you've finished your experiment, can you accept or reject your hypothesis? (Circle one)

Accept      Reject

What materials are the packing peanuts made from?

Packing Peanut A:

Packing Peanut B:

Which of these materials is renewable? Explain.



Science



Literacy

# PACKING PEANUTS

## STUDENT WORKSHEET

### OBSERVATION



### HYPOTHESIS



### EXPERIMENT



### CONCLUSION





Math



Literacy

# AG-VENTURE WITH CORN

Use the IAITC Corn Ag Mag to help you work through this worksheet!

Match the supply chain step with its explanation and then put the steps in order!

- A. Pollinating      Farmers use machines called combines to separate the kernel from the ears.
- B. Transportation      Pollen from the tassel lands on the silks on the ear to eventually form the kernels.
- C. Harvesting      A tractor pulls a piece of machinery that drops kernels into the ground.
- D. Planting      Corn is loaded on semi-trucks, trains, and barges and taken all over the U.S. and the world.
- E. Storing      After 120 days, the corn is ready for harvest.
- F. Processing      After the corn is harvested, it is taken to a grain elevator where it is prepared for sale.
- G. Maturing      The corn is used for many products, including food, fuel, and animal feed.

Using evidence from the text, explain why corn bioplastic is a good solution to our trash problem.

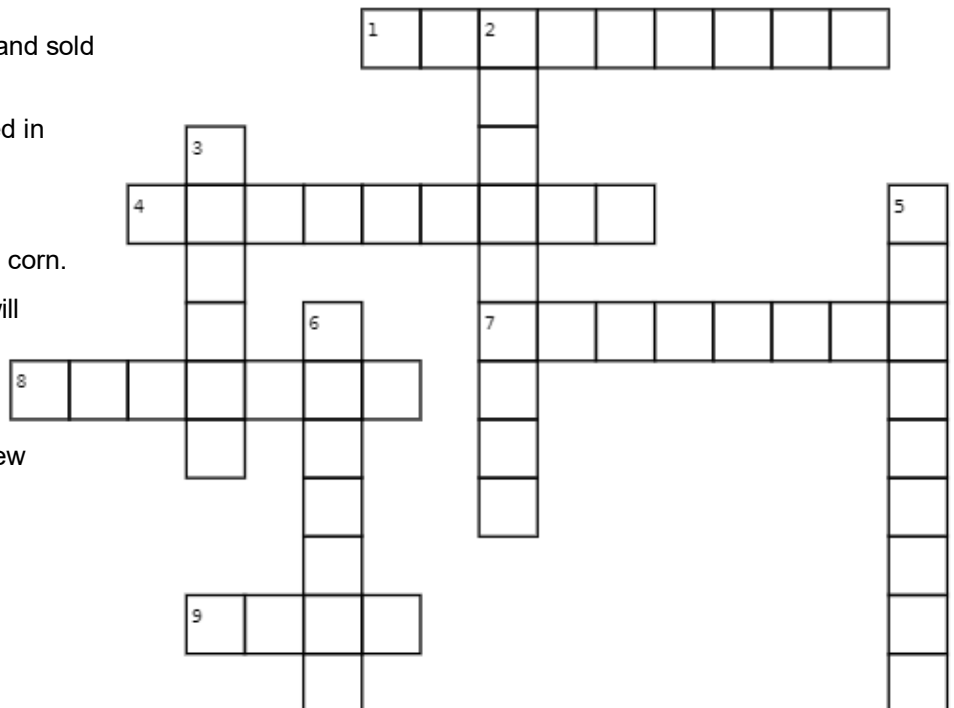
Supply Chain Order: \_\_\_\_\_

## ACROSS

- 1. The type of corn grown in gardens and sold at farmers markets.
- 4. Also known as dent corn and is used in over 4,000 different products.
- 7. The outside cover of the seed.
- 8. A high performance fuel made from corn.
- 9. The only living part of a seed that will eventually become the new plant.

## DOWN

- 2. Holds the energy and protein the new plant will use to grow.
- 3. The location where the kernel was attached to the cob.
- 5. Selling extra products, like corn, to other countries.
- 6. The official Illinois snack food.



# TEACHER RESOURCES

## ANSWER KEY

Match the supply chain step with its explanation and then number the steps in order.

- |                   |  |
|-------------------|--|
| A. Pollinating    | Farmers use machines called combines to separate the kernel for the ears.                    |
| B. Transportation | Pollen from the tassel lands on the silks on the ear to eventually form the kernels.         |
| C. Harvesting     | A tractor pulls a piece of machinery that drops kernels into the ground.                     |
| D. Planting       | Corn is loaded on semi-trucks, trains, and barges and taken all over the U.S. and the world. |
| E. Storing        | After 120 days, the corn is ready for harvest.   |
| F. Processing     | After the corn is harvested, it is taken to a grain elevator where it is prepared for sale.  |
| G. Maturing       | The corn is used for many products, including food, fuel, and animal feed.                   |

Supply Chain Order:   D     A     G     C     E     B     F  

Using evidence from the text, explain why corn bioplastic is a good solution to our trash problem.

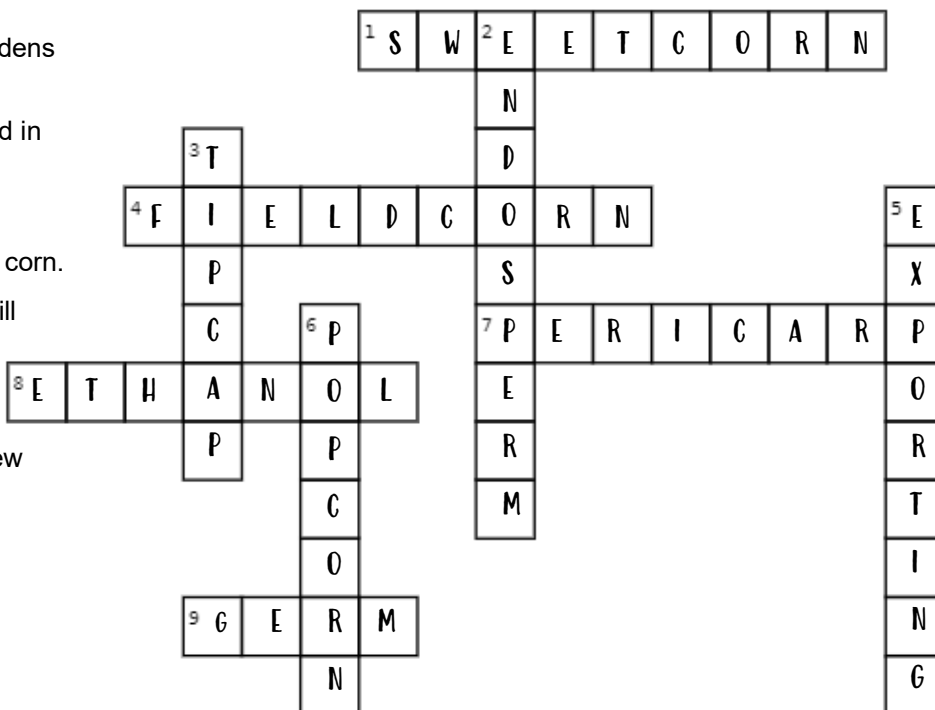
*Answers will vary but should mention that plastics are currently made from petroleum, a non-renewable resource, that takes centuries to break down. Corn bioplastic is a renewable resource and is biodegradable, breaking down in months instead of centuries.*

### ACROSS

- The type of corn that is grown in gardens and sold at farmer's markets.
- Also known as dent corn and is used in over 4,000 different products.
- The outside cover of the seed.
- A high performance fuel made from corn.
- The only living part of a seed that will eventually become the new plant.

### DOWN

- Holds the energy and protein the new plant will use to grow.
- The location where the kernel was attached to the cob.
- Selling extra products, like corn, to other countries.
- The official Illinois snack food.





# RUMINATION NAVIGATION

## Grade Level

4-6

## Length of Lesson

45-60 minutes

## Objective

By the end of this lesson, students will have a better understanding of the digestive system of ruminant animals.

## Materials Needed

- Containers (resealable snack size baggies or solo cups)
- Plastic spoons
- [Paint cone strainers](#)
- Paper Towels
- Carbonated drink
- Water
- [Potato Sticks](#)\*
- Pop Rocks candy
- Measuring cups: 1/4 cup, 1/8 cup, 1 tablespoon, 1/2 teaspoon
- Permanent markers
- Copies of student worksheet

## Standards

### NGSS

4-LS1-1; 5-PS1-4; 5-PS3-1; MS-LS1-3; MS-LS1-7

## Lesson Summary

This lesson is a fun, hands-on activity designed to help students understand the process of rumination and how digestive systems break down food for energy. It is best to be used as an extension lesson as some understanding of the ruminant digestive system is beneficial to understand the steps in the activity.

\*If you don't have access to potato sticks, any type of potato chip or even a half slice of bread would work just fine.

## Suggested Sequence of Events:

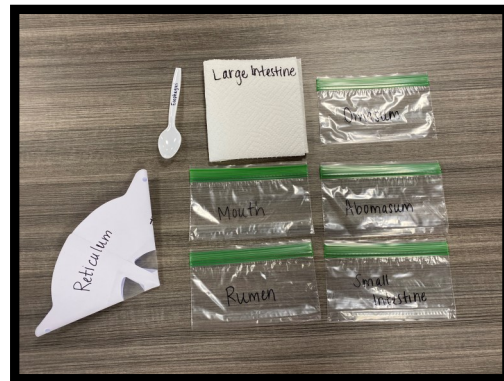
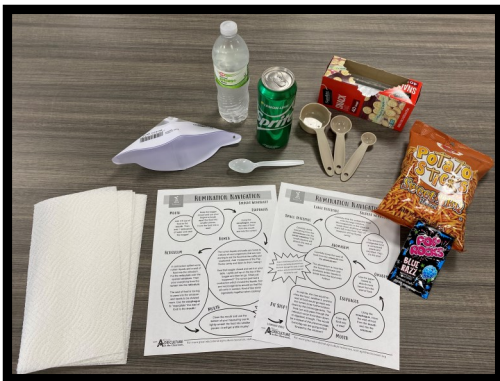
1. **Set Up:** To save time, have the materials divided so that all the materials for one group are together. If time allows, you can have the 1/4 cup of potato sticks measured and ready in a container.
2. Read through the IAITC [Beef Ag Mag](#) and [Dairy Ag Mag](#) to learn more about two important ruminant animals! Interactive online versions can be found on our website.
3. Complete the activity following the procedures:
  - Divide students into groups of 2-3 and have one person from each group collect the materials.
  - Hand out the student worksheets so that each student has their own, and read through the introduction together.
  - Read through the "Set Up" on the first page of the student worksheet as a whole class so students are aware of what they need to do first.
    - Students need to label their baggies and strainer, measure the 'digestion' materials and put them into the appropriate baggies, and then follow the steps on their student worksheets.
  - When finished, have students clean up their materials according to your classroom instructions!
  - Once cleaned up, have students work together, or individually, to answer the questions on the student worksheet.
4. Whole class discussion and reflection of activity.



# TEACHER RESOURCES

## Extension Ideas:

- Have students color code the steps to the cattle diagram by coloring in the instruction shape and the matching digestive system part the same color.
- Have students write map directions for the route food takes in ruminant digestive systems.
- Read through our “Moovin’ On Through” non-fiction text that explains the different parts of the ruminant digestive system in more detail.
- Compare and contrast the ruminant digestive system to a monogastric digestive system.
- Have student define the word ‘rumination’. Compare that definition with the definition for ‘monogastric’.
- Invite a beef cattle farmer into your classroom to talk with your students!
- Learn more about beef by-products.
- Learn about the history of cattle in the United States.
- Have students share their favorite beef recipes.
- Learn about what cattle eat and how they are cared for by farmers and ranchers.
- Research cattle breeds in the United States and compare to cattle breeds around the world.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!





# RUMINATION NAVIGATION

## STUDENT WORKSHEET

**Introduction:** Food is made up of ingredients that provide nutrients and minerals to our bodies! All animals, including humans, need these nutrients and minerals for our bodies to function properly and to have energy. The digestion system is responsible for breaking down the food we eat, taking as many of those nutrients and minerals as the body needs, and then gets rid of what is not needed. Unlike humans, ruminant animals (like sheep, cattle, goats, and even camels) have a more intricate digestive system. This is because they eat plants, like grass, that is harder to break down than the foods we eat. Let's get a hands-on understanding of what happens to the food during rumination.

### Set Up

Let's get the materials set up so that you can easily navigate your way through the ruminant digestive system!

1. Check to make sure you have all of the following materials:

- 5 baggies
- 6 paper towels
- 1 strainer
- Carbonated drink
- Pop Rocks candy (microorganisms)
- Food
- Water
- Spoon

2. **Label** your materials so that you know which material represents which part of the digestive system.

- Baggie 1: Mouth
- Baggie 3: Omasum
- Spoon: Esophagus
- Baggie 4: Abomasum
- Baggie 2: Rumen
- Baggie 5: Small Intestine
- Strainer: Reticulum
- 2 Paper towels: Large Intestine

3. Now we need to measure out some of our materials and put them into the correct baggies!

- Rumen: 1/4 cup water
- Abomasum: 1/8 cup carbonated drink
- Omasum: 2 folded paper towels
- Small Intestine: 2 folded paper towels

---

Now that your materials are set up, it's time to ruminate! The instructions on the next pages will refer to all the containers as the **scientific name** of the digestive system section they are modeling. Start with the mouth and follow the arrows!



# RUMINATION NAVIGATION

## STUDENT WORKSHEET

### MOUTH

Add 1/4 cup of food to the **mouth**. Then add 1 tablespoon of water and seal the baggie!

Keep the baggie closed and use your fingers to break apart the food into smaller pieces. Form the food into a wad!

### ESOPHAGUS

Using the **esophagus**, move the wad of food from the mouth and into the rumen!

### RUMEN

The rumen liquids and walls are home to millions of microorganisms that are now starting to eat the food that the cattle just swallowed. Add 1 teaspoon of the Pop Rocks candy and listen to them 'eating'!

Seal that baggie closed and set it on your table. Lightly pull up on the top of the baggie and then let go. What just happened? The rumen just had a contraction which moved the liquids, food, and microorganisms around so that they all come in contact. Kind of like stirring ingredients together when cooking!

### RETICULUM

A contraction spilled some rumen liquids and a wad of food into the reticulum. Put the **reticulum** over the opened **omasum**. Then pour everything from the **rumen** into the **reticulum**.

The wad of food is too big to pass into the omasum and needs to be chewed more. Use the **esophagus** to "regurgitate" the wad of food to the **mouth**!

### MOUTH

Close the mouth and use the bottom of your measuring cup to lightly smash the food into smaller pieces—it will get a little mushy!

This is called "chewing the cud"



# RUMINATION NAVIGATION

## STUDENT WORKSHEET

### LARGE INTESTINE

Carefully drop the undigested food onto the large intestine. Microorganisms in this area will break down anything of value that's left in the food. Add 1/2 teaspoon of Pop Rocks candy.

The remaining undigested food is considered waste and excreted. Yep—it's the poo!

### SMALL INTESTINE

Carefully dump everything from the **abomasum** into the **small intestine!** The small intestine will absorb the rest of water.

### ABOMASUM

Carefully dump the wad of food from the **omasum** into the **abomasum!**

The abomasum is most like the human stomach and produces acidic liquids to break down the food even further!

### OMASUM

Use the paper towels to absorb more liquid from the wad of food.

### ESOPHAGUS

Using the **esophagus**, move the wad of food from the **mouth** and into the **omasum!**

Form the food into a wad!

### MOUTH

In real life, the cow would re-chew the food, swallow it, and the wad of food would go back into the rumen to be further broken down by the microorganisms. The food can only pass through the reticulum once it's broken down, or digested, enough. This would be a repeat of the previous page, but today we are going to fast forward to the omasum!

Keep in mind that nutrients and minerals are being absorbed from the food, through the walls in each section, and are sent throughout the body for use!

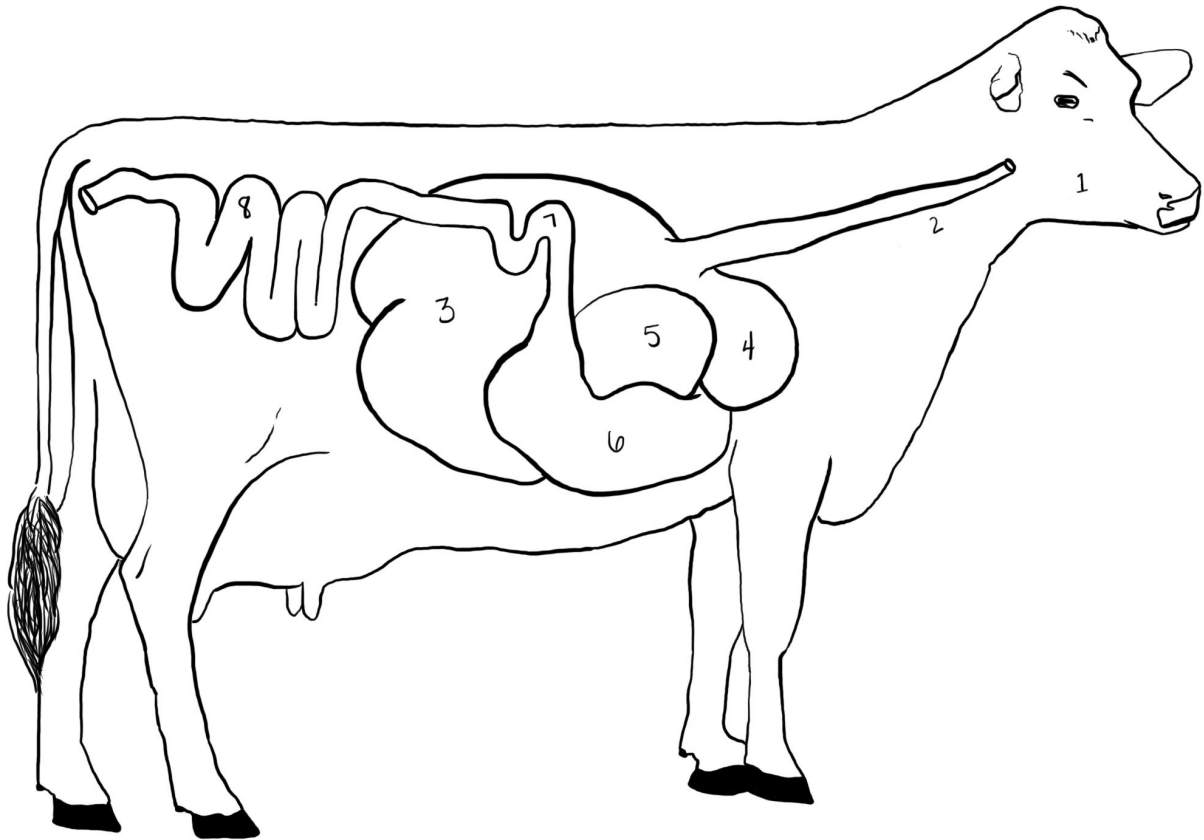
### PIT STOP!

(CONTINUE HERE)



# RUMINATION NAVIGATION

## STUDENT WORKSHEET



- 
1. You added water to the mouth to help break down the food. What did that water represent? Think about what happens when you chew your food.
  
  2. You added Pop Rocks candy two different times in the activity. What did the Pop Rocks candy represent and why are they important in digestion?
  
  3. Why do cows regurgitate their food?





# BACON BLACKOUT POETRY

## Grade Level

4+

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will be able to create poetry using non-fictional texts.

## Materials Needed

- Access to paper copies or online version of our AITC Pork Ag Mag
- Black markers

## Standards

### Common Core

CCSS.ELA-Literacy.RL.4.2;  
RL.4.5; RI.4.7; W.4.5;  
L.4.4; RL.5.6; RL.5.7;  
RI.5.1; RL.6.4; CCRA.R.4;  
CCRA.R.6; CCRA.R.7

## Lesson Summary

This lesson is designed to introduce or strengthen students' skills of writing poetry. Blackout poetry is a great beginning to a poetry unit because it allows students to create a poem by removing words from an already written piece of non-fiction!

## Suggested Sequence of Events:

1. Read through the [AITC Pork Ag Mag](#) to learn more about pork and familiarize students with the text they will be using!
2. Complete the activity following the procedures:
  - Make copies of the different sections of the Pork Ag Mag and have students choose which section they would like to focus on.
  - Once students have chosen their section, have students read through it a few times to become more familiar with the material.
  - Students will begin to create a poem by “blacking out” any words and phrases that they do not want to use. The words that are left will become their poem. Note: For some students, it may be a good idea to have them start by using a pencil. Once they are sure of their choices, they can permanently black out the words with a marker.
  - Once students have chosen their words, they should start creating their poem on a separate piece of paper or on a computer. Depending on your students, you may want to create different parameters. Typically for blackout poems, students must use the words in order as they were originally written. Feel free to change this “rule” if necessary. You can also consider allowing students to change the form of words, such as allowing them to change verb tenses or making singular nouns into plural nouns. You can also encourage students to add any punctuation they feel necessary for their poem.
  - Once they're happy with their poem, students can use some of the words from their poem to create a meaningful title.
4. Whole class discussion and reflection of activity. Here are some discussion starters: What is the topic or focus of your poem? What did you learn about pigs and pork through this activity? How did your poem change from the original text? What did you find challenging about this activity?



# TEACHER RESOURCES

## Extension Ideas:

- Have students read their poems out loud to the class.
- Have students who chose the same section compare their poems.
- After students have blacked out the text to form their poem, challenge them to do another, and this time, create an image that relates to their poem.
- Use our “Ag Mag Scavenger Hunt” lesson to help your students analyze the text even further.
- Have students create other blackout poems using their choice of any of our [AITC Ag Mag](#) topics.
- Read “[Awesome Agriculture: Pigs an A-to-Z Book](#)” by Susan Anderson & JoAnne Buggy. Look at the pictures and have students analyze the images.
- Introduce or review the word ‘livestock’ to your students and talk about why farmers raise animals. What do we use pigs for?
- Learn about all the products we get from pigs. Why are pigs so important for us?
- Find various recipes that use pork products. Dig deeper and compare pork dishes from around the world.
- Watch a video that talks about what pigs eat and where they live. What do pigs need to be healthy?
- Learn about different pig species around the world.
- Invite a pig farmer into your classroom to talk about pig farming.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Ag Literacy Coordinator for free classroom sets of our Ag Mags!

# TEACHER RESOURCES

## Blackout Poem Example:

- *Here is the original text from a section of the Pork Ag Mag:*

### Farmers & the Environment

Farmers are always concerned about the environment around them. After all, their families live close to the farms. Agriculture researchers are constantly looking for new ways to improve the quality of the environment and reduce odor.

Sometimes you can smell manure on a pig farm. Manure is a very important part of the agriculture cycle. As plants grow, they pull nutrients up from the soil through their roots. Eventually, the nutrients need to be replaced. These nutrients can be replaced with fertilizers – like pig manure. Manure is a great source of nutrients that plants need to grow – like nitrogen (N) and phosphorus (P).

Farmers inject manure into the ground about six to eight inches with a machine. This machine helps increase the nutrients in the ground and reduces the runoff and odor. Before the manure is applied it is held in large underground pits, lagoons or other storage facilities. These holding areas are lined with clay, plastic or concrete to make sure that none of the manure leaks into the ground. When the farmer is ready to apply manure, it is pumped into a manure tanker and ready for application.

- *And here is a blackout poem created from this section. Words were kept in the same order. The author chose where to place the line and stanza breaks and added punctuation throughout the poem.*

### PIG MANURE!

Farmers are  
concerned about the environment—  
constantly looking for new ways  
to improve.

Manure on a pig farm:  
a very important part of the agriculture cycle!  
Plants grow!  
They pull nutrients from the soil!  
The nutrients need to be replaced!

PIG MANURE! =  
a great source of nitrogen and phosphorus.

Farmers inject manure with a machine.  
Increase the nutrients in the ground,  
reduce runoff and odor.

The farmer is ready to apply manure.  
Ready for application!



# EGG-CELLENT EMBRYOLOGY

## Grade Level

3-6

## Length of Lesson

5-10 minutes each day for 21 days

## Objective

By the end of this lesson, students will have a better understanding of how chickens develop inside an egg.

## Materials Needed

- Copies of chicken development pictures\*
- [White, plastic eggs](#)
- Egg cartons

## Standards

### NGSS

3-LS1-1; 3-LS4-4; 4-LS1-1; MS-LS1-1; MS-LS4-3

\*To print the embryo pictures so that the pictures line up with the facts, set your printer settings to print on both sides and to flip sheets on the short edge.

## Lesson Summary

This lesson is a fun activity that allows students to see how the chick is developing inside of the egg, whether you are incubating eggs in your classroom or not! Students should have a basic understanding of the life cycle of a chicken (Egg—Embryo—Hatchling—Chick—Chicken).

## Suggested Sequence of Events:

1. Set Up: Print the embryo development pictures on printer paper or cardstock, cut them all out, and then laminate for multiple uses! Then number the plastic eggs 1-21 and place the embryo development picture into its matching numbered egg. Lastly, place the eggs in the egg cartons. Make enough sets for students to work in small groups of two or more.
2. Read through the [IAITC Poultry Ag Mag](#) to learn more about chickens and other poultry facts! Interactive online versions can be found on our website.
3. Complete the activity following the procedures:
  - Define the word **embryology** as a class and talk about how this is an important part of all plant and animal life cycles!
  - Ask your students if they know how the embryo develops in its egg. Have your students brainstorm and share.
  - Read the background information on the Teacher Resources page to your class and then have students write a few questions they hope to have answered about chick development.
  - Talk about what chicken eggs require for a healthy chick to grow (temperature, rotation, tools used to help, etc.)
  - Each day, have students open the egg with the correct day on it, and observe what the embryo looks like. Then, have them flip over the laminated egg and read about what is developing on that day.
4. Whole class discussion and reflection of activity. Have students read the questions they wrote before beginning the activity and answer them either by writing complete sentences and/or sharing with the class. Here are some other discussion starters: How could you tell the differences between the stages? What happens to the yolk, vitelline membrane, and the albumen?

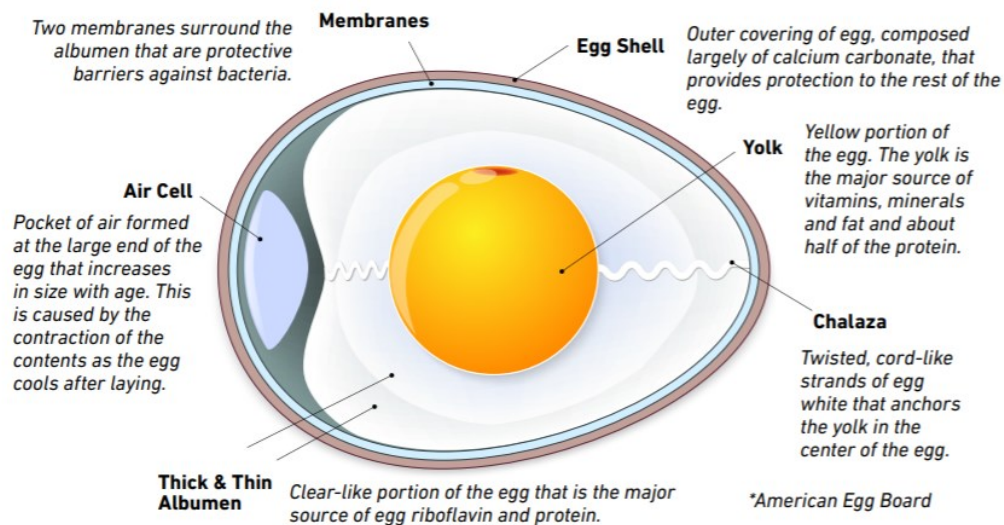
# TEACHER RESOURCES

## Background Information:

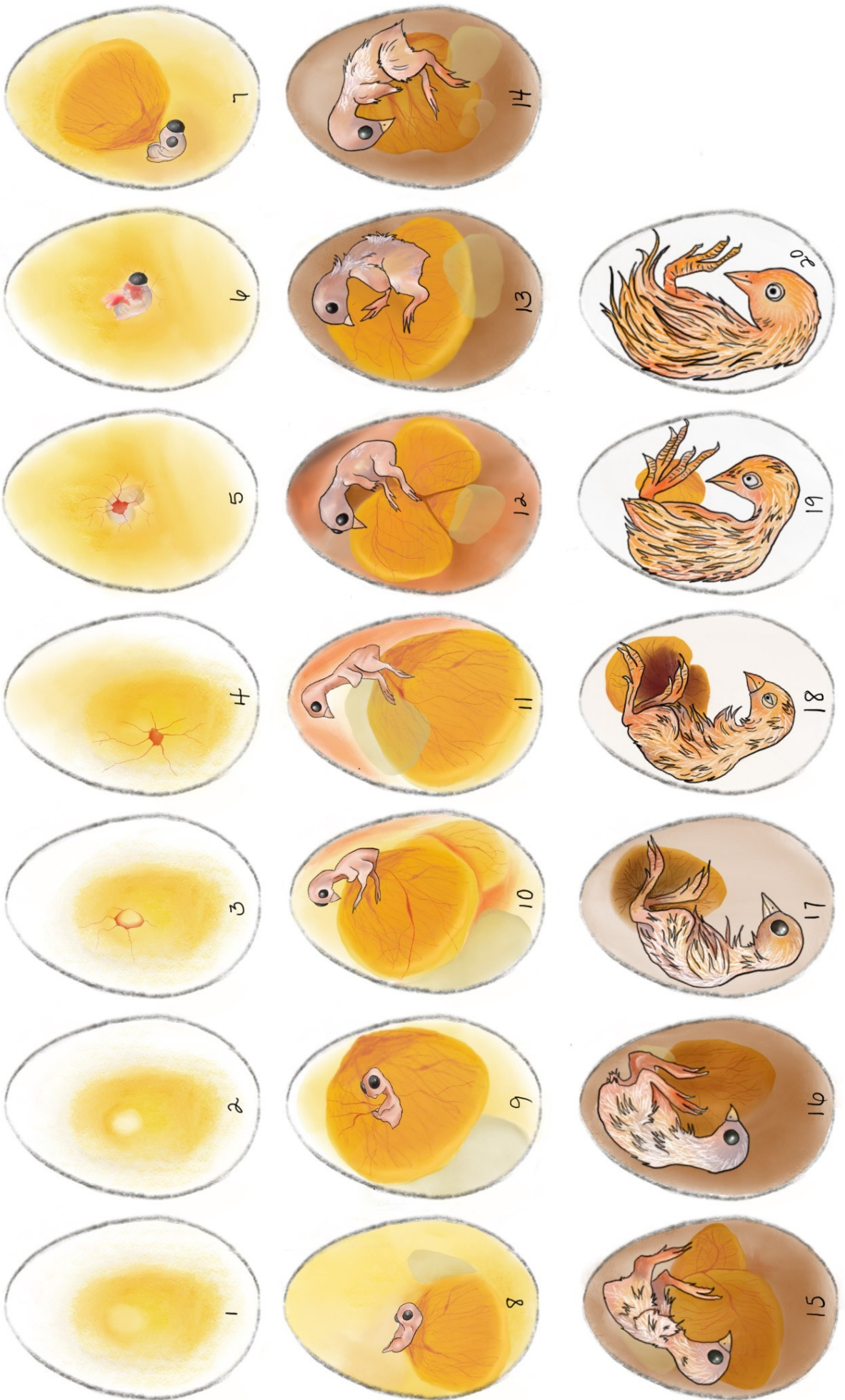
About 24 hours before a hen lays her egg, it must be fertilized by a rooster for it to become a chick. This process, called fertilization, forms a single cell that will begin to divide into 2, then 4, 8, 16, and so on! By the time the hen lays her fertilized egg, there will be hundreds of cells grouped together. These cells make a small, white spot, which can be easily seen on the surface of the yolk. The egg forms temporary organs that provide the embryo with nutrition, excretion, and respiration. These organs will continue to function until hatching time.

## Extension Ideas:

- Have students make an “Embryo Egg-Venture” daily journal and record (write and/or draw) their observations each day.
- After the 21 days are over, talk about how the chicks crack open their shells from the inside!
  - What do chicks need to be healthy and safe once they hatch?
- If you’re not incubating eggs in the classroom, learn more about the importance of temperature and moisture control for embryo development.
- Watch [this](https://www.youtube.com/watch?v=DW3Tw5qpfZQ) video that shows the growth of the embryo each day. Video is available at <https://www.youtube.com/watch?v=DW3Tw5qpfZQ>
- Invite a chicken farmer or egg producer into your classroom.
- Watch a virtual field trip from the American Egg Board.
- Research what states produce the most eggs.
- Learn about different breeds of chickens!
- Have students share their favorite egg recipes and learn more about the nutrition of eggs and chicken.
- Have students strengthen their non-fiction literacy skills with our Ag-Venture with Poultry, 1-page activity sheet that pairs with our IAITC Poultry Ag Mag.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!













Science



Literacy

# WHEAT MILLING

## Grade Level

K-4

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will have a better understanding of wheat as a plant.

## Materials Needed

- [Wheat Stalks](#) (available at [agclassroomstore.com](http://agclassroomstore.com))
- Salt or Pepper Grinder

## Standards

### Common Core

CCSS.ELA-Literacy.RI.K.10; RI.1.6

CCSS.Math.Content.K.C.C.A.1

### NGSS

K-LS1-1; 2-LS2-2; 3-LS1-3

## Lesson Summary

This lesson is designed to help students identify the parts of a wheat plant while learning about its uses in various food products.

## Suggested Sequence of Events:

1. Set Up: Gather enough wheat stalks for each student in your class or for small groups of students. Draw or print out a diagram of a wheat stalk as a guide for you and your students.
2. Read "[Farmer George Plants a Nation](#)" by Peggy Thomas to capture student interest.
3. Read through the [AITC Wheat Ag Mag](#) to learn more about wheat. Interactive online versions can be found on our website.
4. Complete the activity following the procedures:
  - Show students wheat stalks.
  - Go over the parts of the wheat stalk with the students to familiarize them with the parts so they can understand the directions for dissection.
    - Stalk—the entire plant.
    - Head—the part of the wheat plant that contains the kernels.
    - Beard—the bristle-like parts of the wheat plant that cover and protect the kernels.
    - Kernel—the seed from which the wheat plant is grown or that people harvest from the wheat plant to grind into flour.
    - Stem/Straw—the part of the wheat plant that supports the head and is known as straw after harvest.
  - Dissect the wheat using the following steps:
    - Break the head off the stem.
    - Make a straw out of the stem by breaking it to avoid the nodes.
    - Lay the wheat head flat on a hard surface and pat with your hand to shake out the kernels.
    - Have the students count their kernels.
  - Put the kernels of wheat into a salt or pepper grinder and have the students mill their wheat into flour. What simple machines are being used?
  - Talk about different ways to grind wheat. The Native Americans did it using rocks, etc. Have students design their own method of grinding wheat and then test their machines.

# TEACHER RESOURCES

## Extension Ideas:

- Read "[Bread Comes to Life](#)" by George Levinson. Then, have students find the gluten in wheat by chewing the kernels. Before there was chewing gum in the store, farmers made their own with grains of wheat!
- Ask the students to list some of the foods that can be made using flour. (*Bread, cake, cookies, brownies, pasta, crackers, etc.*)
- Have students listen to "[The Little Red Hen](#)" by Paul Galdone.
  - Bring in seeds, stems, flour, and bread and put them down in a random order. Have student pay attention to the steps the hen takes to plant her wheat . Have students work together to put items in the correct order.
- Have students label and color a wheat stalk.
- Discuss what wheat needs to grow (Light, water, air, and nutrients). Then, help students plant their own wheat.
  - As their wheat grows, you can continue to discuss this lesson by asking these questions:
    - How many days did it take for the wheat seeds to sprout?
    - What do the wheat plants look like?
    - What do the plants need to grow?
- Watch a video of wheat being harvested.
- Watch a video from a local farmer discussing wheat growth and harvest.
- Invite a wheat farmer into the classroom.
- Have students research each step of growing wheat and write a paragraph explaining what happens at each phase. How long does each phase take?
- Bring in different types of bread (sweet, rye, sourdough, white, etc) and have students sample each type. After sampling have students write about which kind they liked the best and why.
- Encourage students to try making their own bread at home.
- Have students do IAITC's Soil Sam lesson, using wheat seeds for the "hair."
- Go to [agintheclassroom.com](http://agintheclassroom.com) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!





Math



Art

# MOO MASK

## 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!

# TEACHER RESOURCES

## Moo Mask Ear Tags:

- Have the students write out their first and last names.
- With their names in front of them, have each student write the number of letters in both their first and last names.
- Then have the students add the number of letters in their first name to the number of letters in their last name.
- When the student correctly adds the numbers in their name, have them write the numbers on the cow tag. Then attach it to the ear of their moo mask.
- Example for “Johnathon Deer”:

$$\begin{array}{rcccl} \text{Johnathon} & & \text{Deer} & & \\ 9 & + & 4 & = & 13 \\ (\# \text{ in first name}) & & (\# \text{ in last name}) & & (\text{Total}) \end{array}$$

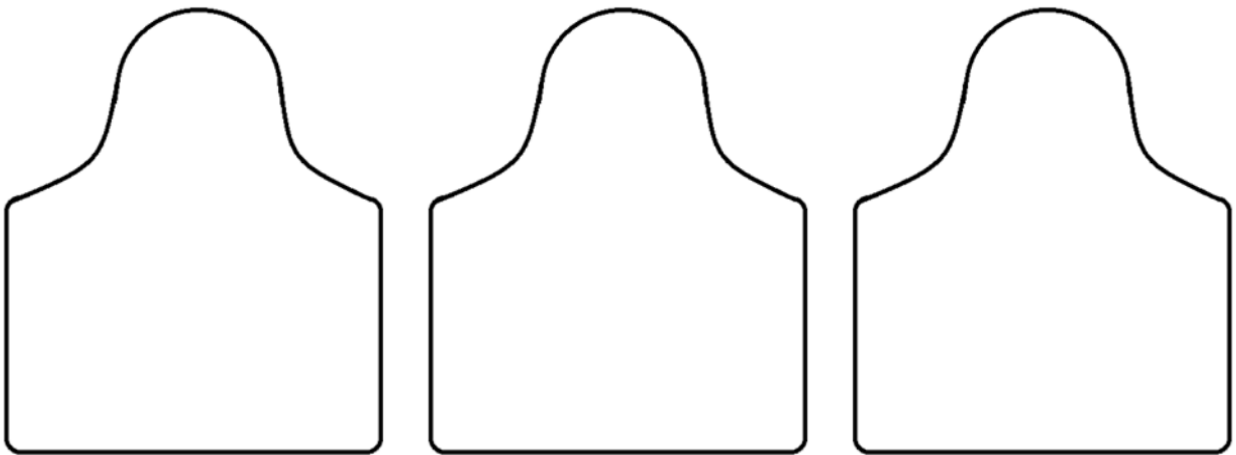
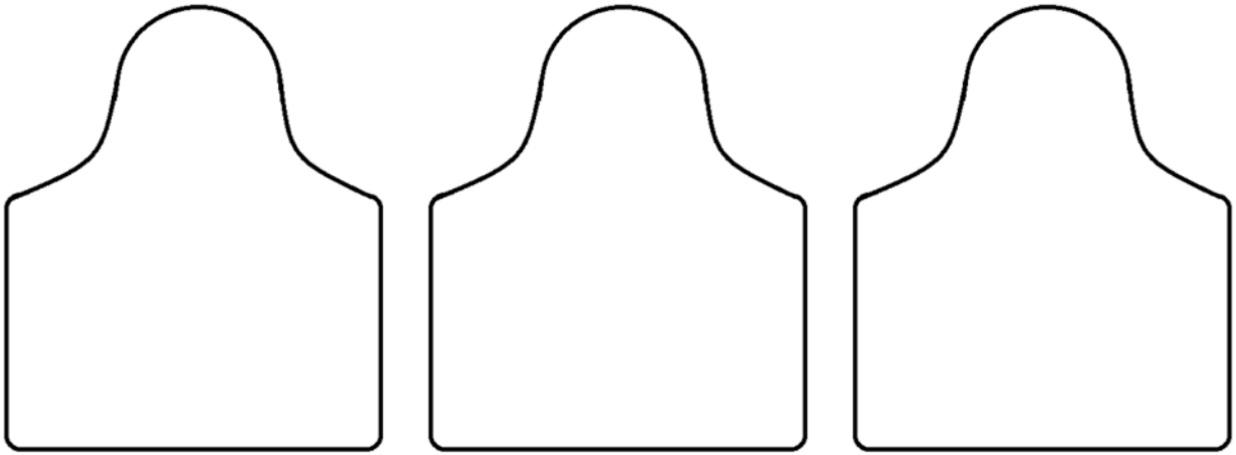
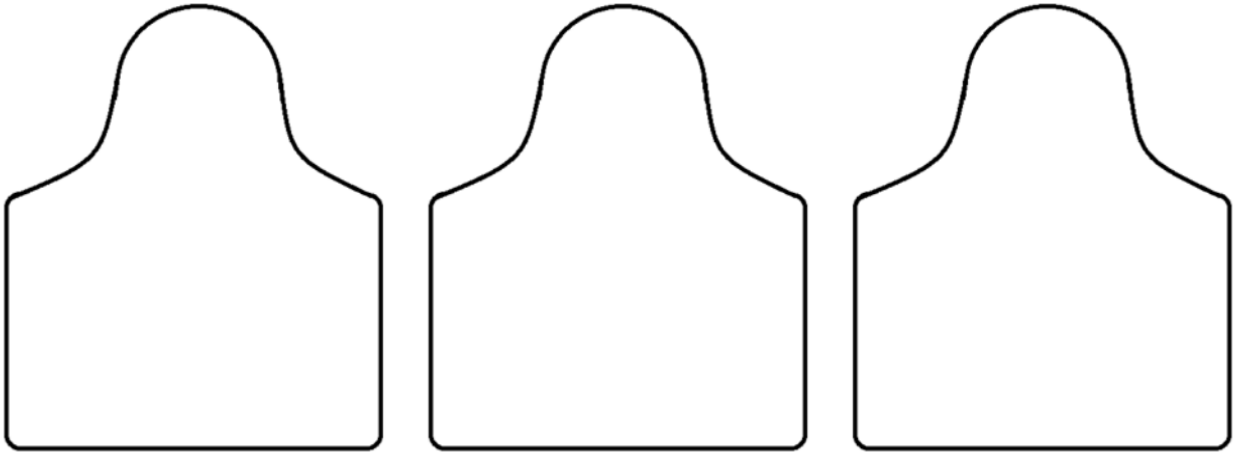


## Extension Ideas:

- Use the ear tags as a way to practice sequencing! For example, tell them to line up numerically by their tag numbers! Make it fun and time how long it takes them to get in order!
- Read about why dairy cows are tagged. Are beef cattle tagged the same way?
- Read “[Click Clack Moo](#)” by Doreen Cronin. Look at the pictures and see if students can identify the breed of dairy cattle shown in the story. (Holstein Dairy Cattle)
- Talk about how milk gets from the farm to your fridge after watching this video: [Glass Is In Session](#). Video can be accessed at: <https://www.youtube.com/watch?v=ztmRrwe0ITA&feature=youtu.be>
- Go on a field trip to a dairy farm or do it virtually and let 10 year old Jenna take you on a tour through her Family's dairy farm: [Jenna, a Dairy Farmer | Citizen Kid by Disney](#). This video can be accessed at: <https://www.youtube.com/watch?v=EOAavg4ftFk>.
- Have students color a picture of a dairy cow.
- Show a labeled diagram of a dairy cow.
- Introduce or teach about pasteurization and homogenization.
- Talk more about different products that come from dairy cows.
- Invite a dairy farmer into the classroom.
- Introduce the word ‘livestock’ to your students and talk about why farmers raise animals.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!











# MILK PLASTIC

**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.

# TEACHER RESOURCES

## Background Information:

This activity doesn't produce an actual plastic, but instead a substance called casein. Casein comes from the Latin word meaning "cheese" and is one of the several proteins that are found in milk. The acid from the vinegar does not mix with the casein in the milk, causing clumps to form. Basically your end product, the milk "plastic", is the casein proteins from the milk all clumped together.

True plastics are polymers, which are a little different than the casein substance. A polymer is a chemical compound that is made up of long chains of repeating, identical molecular units. Keep in mind that not all polymers are plastics but all plastics are polymers.

## Extension Ideas:

- Have students turn their milk plastic into ornaments, toys, or gifts for their family or friends.
- Have students mold their milk plastic into a shape related to agriculture.
- Have students write the steps of this activity out, in order, including descriptive language.
- Have students demonstrate their understanding by explaining what happened in the activity using a variety of ways: draw a comic strip, create a fictional narrative, film a short video, write a lab report, etc.
- Take a closer look at polymers (plastics). What are other types of polymers? How does this milk "plastic" compare to other plastics? (Making slime is also another fun activity that focuses on polymers.)
- Scientific Inquiry: Take the experiment to the next level and have students make predictions and test different variables. (Use our Scientific Inquiry worksheet to help guide them through their experiment.)
  - Does the amount of vinegar make more casein?
  - What would happen if you used skim milk or soy milk?
  - What if you used other types of vinegars?
  - If the acid from the vinegar caused the reaction, will acids from citrus and fruits cause the same reaction?
- Read "[Clarabelle: Making Milk and So Much More](#)" by Cris Peterson. Look at the pictures and have students analyze the images.
  - Have students write a short story or create a comic strip from Clarabelle's perspective.
- Take a field trip to a dairy farm and learn about dairy farming.
- Invite a dairy farmer into the classroom.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!



Science



Literacy

# WAD-O-WATERSHED

## Grade Level

3-5

## Length of Lesson

45 minutes

## Objective

By the end of this lesson, students will understand the basic geography of a watershed, how water flows through the system, and how people can impact the quality of our water.

## Materials Needed

- Large, Clear Plastic tub
- Waxed Paper (at least two feet per student)
- Spray bottle filled with colored water
- Copies of student Worksheet

## Standards

### Common Core

CCSS.ELA-

Literacy.SL.5.1; W.5.2;

W.5.7

### NGSS

4-MS-ESS2-1; 5-ESS3-1;

5-MS-LS2-1; 3-5-ETS1-2;

5-PS2-1

## Lesson Summary

This lesson is a hands-on activity that will help students identify what a watershed is and how water moves in it. Students will also learn how easily sediment and pollution move through watersheds and the importance of working together to conserve and protect the water in their own watershed. Have students work in small groups for a better experience.

## Suggested Sequence of Events:

1. Set Up: Put your students into groups and hand out materials (each group gets one of each material). Then, have them block their tub so that one end is higher than the other. Hand out the “W-O-W Student Worksheet” to each student.
2. Read “[Water is Water](#)” by Miranda Paul to capture student interest.
3. Define a Watershed and teach the included background information. Have students write the definition on their student worksheet.
4. Look at the Major [Watersheds in Illinois](#), which can be accessed at <http://iaitc.co/watersheds>.
5. Complete the activity following the procedures:
  - Have one student take the piece of wax paper and crumple it up into a ball.
  - Then, partially unfold the wax paper to form a 3D topography, complete with hills and valleys. This is your “wad-o-watershed.”
  - Place the wax paper in the tub.
  - Explain to students that we all live in a watershed. Have them hypothesize about the movement of water and what would cause that movement and write it on their student worksheet.
  - Have another student spray the colored water on the high points, or “divides,” of the watershed. Make sure they observe the flow of the water and fill out the next part of their student worksheet.
6. Have students work in their groups to finish their worksheets and then discuss the answers as a class.

# TEACHER RESOURCES

## Background Information

- A watershed is a geographic area in which water, sediments, and dissolved minerals all drain into a common body of water like a stream, creek, reservoir, or bay (the land that water flows across or under on its way to a stream, river, or lake).
- Large watersheds like the ones for the Mississippi River, Columbia River, and Chesapeake Bay are made up of many smaller watersheds across several states.
- A watershed includes all the plants, animals, and people who live in it, as well as the non-living components like rocks and soil. We are all part of a watershed, and everything we do can affect the surface and ground water that runs through this system.
- People influence what happens in watersheds, good or bad, by how the natural resources – the soil, water, air, plants, and animals – are treated. The quantity and quality of water draining from a watershed are dependent upon the climate, vegetation, soils, geology, and development of that watershed.
- Watersheds come in many different shapes and sizes. Landscape is made up of many interconnected basins or watersheds. Within each watershed, all water runs to the lowest point, such as a stream, river, or lake, due to the force of gravity. On its way, water travels over the surface and across farms, fields, forest lands, suburban lawns, and city streets, or it seeps into the soil and travels as groundwater.
- Activities that change the vegetation and surface characteristics of some watersheds will affect the quantity and quality of water contributed to a stream. What happens in small watersheds, such as pollution, also affects the larger watersheds downstream. Point source pollution is water pollution from an activity originating from an identifiable source. Nonpoint source pollution is water pollution from sources not easily identified.

## Possible Answers for List on Student Worksheet

Agriculture	Household	Recreational	Industrial	Natural Events
<ul style="list-style-type: none"> <li>• Crops</li> <li>• Animals</li> <li>• Golf Course</li> <li>• Horticulture Crop</li> </ul>	<ul style="list-style-type: none"> <li>• Homes: Drinking, Bathing, Washing Dishes, Washing Cars</li> <li>• Lawns/Gardens</li> <li>• Waste Water Treatment Systems</li> </ul>	<ul style="list-style-type: none"> <li>• Parks</li> <li>• Meadows</li> <li>• Woods</li> <li>• Camping Areas</li> <li>• Bike Paths</li> <li>• Swimming Areas</li> <li>• Boating Areas</li> <li>• Sporting Fields</li> </ul>	<ul style="list-style-type: none"> <li>• Factories</li> <li>• Schools</li> <li>• Storage Units</li> <li>• Warehouses</li> <li>• Parking Lots</li> <li>• Gas Stations</li> <li>• Shopping Malls</li> <li>• Offices</li> </ul>	<ul style="list-style-type: none"> <li>• Flooding</li> <li>• Drought</li> <li>• Mudslides</li> <li>• Fires</li> <li>• Storms/Severe Weather</li> </ul>

# TEACHER RESOURCES

## Extension Ideas:

- Have students experiment with the amount of water they spray to see different ways the watershed functions.
- Let's see what happens when we have pollutants in our environment. Find some items to serve as your "pollutants." For instance, Orange Kool-Aid powder could be excess fertilizer on a golf course. Purple Kool-Aid could be a dump site. Mini chocolate chips could be dog poop at the local park. Place the "pollutants" on the watershed and then spray the water. What happens to the pollutants?
  - Connect this with the questions on the student worksheet.
- Have students find where they live on the watershed map of Illinois and share what they notice about it.
- Look at the [Watershed Map of North America](http://iaitc.co/NAwatershed), accessible at <http://iaitc.co/NAwatershed>. This is a government-created map of all the watersheds in North America. Each color represents a different watershed.
  - Consider these questions:
    - How many different watersheds do you see in North America? In the United States?
    - What do you notice about the size and shape of these watersheds?
    - Why is it important to have a better understanding of watersheds in our country?
- Read [A Drop Around the World](#) by Barbara Shaw McKinney to learn more about the journey that water takes as it cycles through the water cycle.
  - Have students draw a comic strip or write an essay from the perspective of the drop of water.
- Collect samples of water from around town and do a water quality test to each sample. Which samples are more polluted and why?
- Complete our "Drop in a Bucket" activity that shows how much fresh water is available on Earth for human use. Then discuss the importance of protecting and conserving water. What can they do to practice water conservation and protection? This lesson and more available at [agintheclassroom.org](http://agintheclassroom.org).
- Talk about soil erosion and how that can also impact the watershed.
- Go to [agintheclassroom.org](http://agintheclassroom.org) to contact your County Literacy Coordinator for free classroom sets of our Ag Mags!



Science



Literacy

# WAD-O-WATERSHED

## STUDENT WORKSHEET

What is a watershed?

Hypothesis:

Was your hypothesis correct? Explain why or why not, using evidence from your activity!

Make a list of all the water use activities, both human activities and natural events, that occur in your watershed:

Agriculture

Household

Recreational

Industrial

Natural Events





Science



Literacy

# WAD-O-WATERSHED

## STUDENT WORKSHEET

How do these uses (from your list) affect local water quality and quantity?

### Point Source Pollution

Water pollution from an activity originating from an identifiable source!

### Nonpoint Source Pollution

Water pollution from sources that are not easily identified or located.

Who and/or what is affected by these pollutants?

In the blank space below, brainstorm what ways we could protect our water and watersheds from being polluted!



Science



Literacy

# CIRCLE OF EARTH BRACELET

## Grade Level

K-4

## Length of Lesson

30 minutes

## Objective

After completing this lesson, students will better understand the inter-connected “circles” of the life systems on Earth.

## Materials Needed:

- 1 pipe cleaner per student
- 1 small clear pony bead (people)
- 1 small blue pony bead (water)
- 1 small green pony bead (plants)
- 1 small brown pony bead (soil)
- 1 small orange pony bead (day)
- 1 small black pony bead (night)
- 1 small white pony bead (air)
- 1 small yellow pony bead (sun)
- 1 small red pony bead (animals)

## Standards

### Common Core

Language Arts: CCSS.ELA-Literacy.RI.4.3; RI.4.4; RI.4.5; RF.4.3a

### NGSS

3-LS2-1; 3-LS4-3; 3-LS4-4; 3-LS1-1; 3-LS3-1; 3-LS3-2; 3-LESS2-1; 3-ESS3-1; 4-LS1-1; 5-ESS3-1

## Lesson Summary

This lesson is designed to help students recognize the important resources our Planet Earth provides us. Students will learn about protecting the planet and will be more prepared for Earth Day!

## Suggested Sequence of Events:

1. Listen to “[Earth: Where Would we be Without It?](#)” by Kathleen Kranking to get students thinking about protecting the Earth.
2. Pre-Activity Discussion:
  - Pass out materials to each students
  - Talk about what the beads represent
  - Blue: Water is a circle. Water rains down on land. Water collects in oceans, rivers, lakes, and streams. It evaporates back up into the sky and collects in clouds. The clouds become heavy, and rain falls down to land again.
  - Green and Brown: Plants and soil are circles. Plants grow from soil. Plants provide food for animals.
  - Red: Animals provide food for other animals. Animals die and decompose. New soil is made. New plants grow.
  - Black and Orange: Earth is a circle. Earth is spinning through space, rotating on its axis, revolving around the sun. The Earth and sun give us the circle of the seasons and the circle of night (black) and day (orange).
  - White: Air is a circle. Animals breathe in oxygen and exhale carbon dioxide. Plants take in carbon dioxide, use it to make food, and give off oxygen. Animals breathe it in again.
  - Yellow: The sun is a circle. The sun provides warmth for light for all of the Earth’s circles. Without the sun, plants and animals would not survive. The sun binds us together.
  - Clear: People move in circles. The earth provides us with everything we need to survive. The survival of our planet hinges on how well we, the people, are stewards of Earth’s resources.
3. Complete the activity following the procedures:
  - String the colored beads on to the pipe cleaner to represent the circles of the Earth.
  - String opposite end of the pipe cleaner back through the clear “People” bead. Now your clear “People” bead is an adjuster for the bracelet since everything “hinges” on the people.

# TEACHER RESOURCES

## Extension Ideas:

- Read "[Earth Day Hooray!](#)" By Stuart J. Murphy to learn more about recycling.
  - Have a discussion about recycling. Talk about different ways you can help recycle.
  - Take a field trip to a park and have students help clean it up.
- Bring in items that can or can't be recycled. Have students vote on if the items are recyclable or trash.
- Have students play [Recycle Round Up](#) on National Geographic Kids to further their recycling knowledge while playing a fun online sorting game!
- Teach students consumption, conservation, and preservation.
  - Divide your students into 3 groups and pass out a small piece of candy to each student
  - Tell Group 1 that they may eat their candy. They represent consumption – the utilization of the resource.
  - Tell Group 2 that they have to make their candy last by unwrapping it slowly, eating small bites, licking on it, savoring it, etc. They represent conservation – the careful use of the resource.
  - Tell Group 3 that they get to admire their candy but they cannot eat it. Ask them to admire the wrapper, the shape, the smell, etc. They represent preservation – saving of the resource for the future.
  - Let all students eat their candy when you're done.
- Read "[The ABCs of Habitats](#)" by Bobbie Kalman to help students learn more about natural animal habitats.
- Go on a nature walk.
  - Upper Grade Levels: Have students take a nature notebook with them to keep track of the things they see or find on their walk. After the walk, have students write a paragraph about their findings.
  - Lower Grade Levels: Talk about different animals or plants you see as you are walking. After the walk, have students draw a picture of something they saw.
  - Allow both grade levels to share their work with a partner and/or the rest of the class.

