

Harvesting the Fruits



Of Ag Literacy

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These lessons complement the Common Core State Standards and may link to the Next Generation Science Standards.

Harvest Seasons Mobile

Objective: Create a mobile to show crops harvested in the United States in different seasons.

Common Core State Standards:

CCSS.ELA-Literacy.RI.1.1; RI.1.5; SL.1.1; SL.1.5

Suggested Reading:

Harvest Year by Cris Peterson (ISBN-13: 9781590787830)



Materials Needed:

- White paper plate
- Yarn
- Construction paper
- Markers
- Stapler
- Staples
- Hole punch

Procedure:

1. Discuss the types of crops that are grown in different regions of the United States all year. You may want to use the book Harvest Year in your discussion.
2. Have the students divide a paper plate into four sections with a marker. Label each section with a season: Winter, Spring, Summer, and Fall.
3. Ask the students to draw crops that are harvested each season on the corresponding section. They should also write the names of the crops.
4. Have the students cut season symbols out of construction paper and hang them from the seasons using yarn. Templates found at www.agintheclassroom.org. These mobiles will hang on the ceiling, so the side the students drew on will face the floor. Then the seasons symbols can hang below it.
5. Punch four holes around the outside of the plate. Then tie some yarn to all four holes. Gather the yarn above the blank side of the plate. This will allow you to hang the mobiles in the classroom.
6. Examples of crops grown in different seasons:
 - January- pineapple in Hawaii
 - February-lettuce in Arizona
 - March-maple syrup in Vermont
 - April- green beans in Florida
 - May-tomatoes in South Carolina
 - June-wheat in Kansas
 - July-cherries in Michigan
 - August-oats in Iowa
 - September-honey in North Dakota
 - October-pumpkins in Illinois
 - November-peanuts in Oklahoma
 - December-shrimp in Louisiana

You can find more crops and the months they are harvested in Harvest Year.

All Around the Barn

Objective: Students will learn all about the farm, nutrition, music and rhythm.

Common Core State Standards:

CCSS.ELA-Literacy.RI.3.5; RI.3.7; W.3.1; W.3.2

Suggested Reading:

All Around the Farm by Parachute Press (ISBN-13: 9780756629779)

EIEIO: How Old MacDonald Got His Farm with a Little Help From a Hen by Judy Sierra (ISBN-13: 9780763660437)

Oink! Moo! How Do You Do? by Grace Maccarone (ISBN-13: 9780590206556)

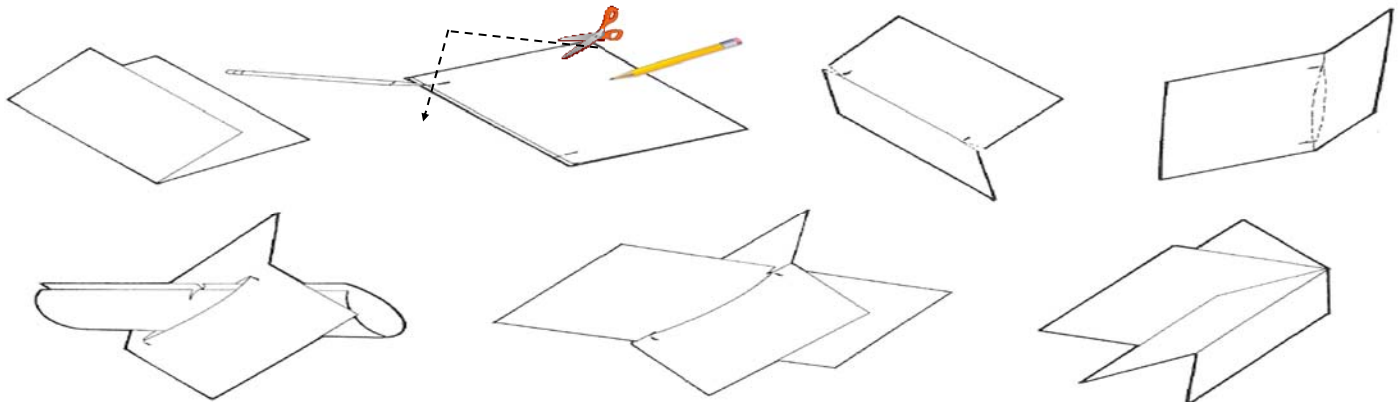
What's in the Big Red Barn? by Marsha Elyn Wright (ISBN-13: 978-0764703218)

Materials Needed:

- Scissors
- Glue
- Crayons or markers
- Red paper and white paper (both 8 1/2 x 11)
- Copy of page 6 for each student

Procedure:

1. Take the red cover sheet and a plain white sheet of paper (both 8½ x 11) and separately hamburger fold each of them.
2. Lay the red cover sheet directly on top of the plain white sheet and cut out the roof shape for the barns.
3. Mark both folds 1 inch from the outer edges.
4. On the red cover page cut up from the top and bottom edge to the marked spot on both sides.
5. On the white folded sheet, start at one of the marked spots and cut out the fold between the two marks. Do not cut into the fold too deeply, just shave it off.
- **For the younger student, mark an index card at the 1 inch distance on both sides. The student can then lay the index card on top of the folds to mark the proper distance.
6. Take the red cover sheet and burrito roll it. Place the burrito through the cut out in the white sheet and then open the burrito. Now fold the pages in half to form your barn book.
7. Use page 6 for ideas to complete the barn book.



All Around the Barn

Barn Book Ideas

1. **Alphabet Activities** — Create a page for each letter of the alphabet. Have students find items related to the farm that begin with each letter of the alphabet. Students can illustrate each page by drawing, coloring, writing or gluing pictures of each object.
2. **Seasons** — The farm is busy all year long. Talk about each of the seasons and what might be happening on the farm during that time of year. What crops are harvested in the summer? Which in the fall? When does planting occur? What is the weather like during each of the seasons? Have students dedicate a page for each season. They can color pictures, cut pictures out of a magazine or write about the different seasons.
3. **Planting and Growth** — Things grow on the farm all year long. Complete the Beanie Baby activity (found on IAITC's website, agintheclassroom.org) to talk about germination. Have students keep a journal of what is happening with their Beanie Baby. Transplant the soybeans after germination and keep a log of the growth process.
4. **Nutrition** — Farmers work hard to feed their animals nutritious meals. They also take special care to make sure the food they produce for human consumption is safe, abundant and affordable. Have the students pick their favorite foods and describe how they come from the farm. What ingredients are used and where did they come from?
5. **Music & Rhythm** — Have the students read EIEIO: How Old MacDonald Got His Farm with a Little Help From a Hen. Have them find the different rhythm's throughout the story while learning all about the farm. The students will fill in the pages with the different animals from the book with 2-3 facts that they have learned about each.



Wheat Milling

Objective: Students will learn the different parts of the wheat stalk and the different ways to grind wheat.

Common Core State Standards:

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

Next Generation Science Standards:

Interdependent Relationships in Ecosystems: 3-LS4-3; 3-LS4-4
Structure, Function and Information Processing: 4-LS1-1



Suggested Reading:

Bread Comes to Life: A Garden of Wheat and a Loaf to Eat by George Levenson (ISBN-13: 9781582462738)

Farmer George Plants a Nation by Peggy Thomas (ISBN-13: 9781620910290)

IAITC's Specialty Crop Ag Mag

IAITC's Wheat Terra Nova found at www.agintheclassroom.org

Materials Needed:

- Wheat stalks
- Salt or pepper grinder

Procedure:

1. Show students wheat stalks.
2. Go over the parts of the wheat stalk with the students 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.
3. Dissect the wheat using the following steps:
 - Hand out stalks of wheat to the students.
 - 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.
4. 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?
5. 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.
6. Talk about the uses of wheat flour to make pastas, breads, desserts, etc.

Lesson Extender:

1. 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! This and other activities can be found in the back of the book Bread Comes to Life.

Adapted from Wheat mAGic Kit

Apple Blossom Tree

Objective: Apple trees bloom in the spring and ripen in the fall. Use this activity to learn more about the apple life cycle.

Common Core State Standards:

CCSS.ELA-Literacy.RI.1.5; SL.1.1; SL.1.2; SL.1.5

Suggested Reading:

Apple Picking Time by Michele Benoit Slawson (ISBN-13: 9780517885758)

A Song for Lena by Hilary Horder Hippely (ISBN-13: 9781442429468)

Hooray for Orchards by Bobbie Kalman (ISBN-13: 9780865056534)

The Apple Pie Tree by Zoe Hall (ISBN-13: 9780590623827)

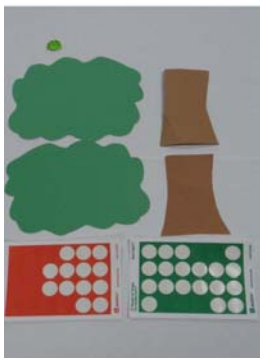
IAITC's Apple Ag Mag

Materials Needed:

- Brown construction paper
- Green construction paper
- White tissue paper
- Pink tissue paper
- Bee or bug sticker
- Red bingo markers
- Glue sticks
- Scissors
- Red marker
- Brown marker

Procedure:

1. Trace the two treetops onto green construction paper and cut out. Two tops are needed for each tree.
2. Trace the tree trunk onto brown construction paper and cut out.
3. Lay one treetop on the table. Glue the tree trunk to this top. Then, match up and glue on the other top.
4. Cut pink and white tissue paper into small squares.
5. On one side of the tree, glue on crumpled tissue paper to represent blossoms.
6. Add a bug or bee sticker to the blossoms. Pollination must occur in order for an apple to grow.
7. Growth first starts in the flower. Label this side of the trunk "spring."
8. On the other side of the tree, use the bingo marker to dab circles on the treetop. When the ink is dry, use the red marker to create stems. Label this side of the trunk "fall."



Apple Chain

Objective: Students will learn the process from seed to mature apple.

Common Core State Standards:
CCSS.ELA-Literacy.RL.4.3; W.4.2

Next Generation Science Standards:
Animals, Plants & their Environment: K-LS1-1
Weather & Climate: 3-ESS2-1
Life Cycles & Traits: 3-LS1-1; 3-LS3-1

Suggested Reading:

Apples by Gail Gibbons (ISBN-13: 9780823416691)

From Seed to Apple by Anita Ganeri (ISBN-13: 9781403478719)



Materials Needed:

- 2 red paper plates per student (or white plates to be colored)
- Crayons
- Glue
- Scissors
- Construction paper (yellow, pink, brown and green)
- Hole punch
- Tape
- Yarn
- Apple Chain templates from <http://www.agintheclassroom.org>
- Stapler

Procedure:

1. Cut each item out of construction paper: seed, tree, blossom, bee, little green apple. Punch a hole on each side of the items you made with construction paper. The brown seed only gets one hole punch.
2. Glue two red paper plates together around 2/3 of the edge. Leave the other 1/3 open. Allow time for it to dry. You can also staple plates together depending on age of student.
3. Tape or staple a piece of yarn to the inside of the paper plates and extend the yarn out of the opening.
4. Add a stem and leaf to the red paper plates to make them look like an apple.
5. Tie the little green apple to the yarn coming out of the apple. Tie the bee to the little green apple. Tie the blossom to the bee. Tie the bee to the tree. Tie the tree to the seed. These should all form a chain.
6. Tuck the green apple, bee, blossom, tree, and seed into the apple. Starting with the seed, slowly pull shapes out of the apple and tell the story of how apples grow.

Apple Charm

Objective: Students will learn the process from seed to mature apple.

Common Core State Standards:

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

Next Generation Science Standards:

Animals, Plants & their Environment: K-LS1-1

Weather & Climate: 3-ESS2-1

Life Cycles & Traits: 3-LS1-1; 3-LS3-1



Suggested Reading:

Apples to Oregon by Deborah Hopkinson (ISBN-13: 9781416967460)

The Apple Orchard Riddle by Margaret McNamara (ISBN-13: 9780375847448)

IAITC's Apple Ag Mag

Materials Needed:

- Yarn
- Small plastic bags (2" x 3")
- Scissors
- Hole punch
- Apple seeds = seed
- Wooden beads = tree
- Foam bees or butterflies = pollinator
- Foam flowers = blossom
- Green pony beads = green apple
- Red pony beads = red apple

Procedure:

1. Talk about the life cycle of an apple tree.
2. Give each student one plastic bag.
3. Have the students put one apple seed (seed), one wooden bead (tree), one foam bee or butterfly (pollinator), one foam flower (blossom), one green bead (green apple), and one red bead (red apple) in the bag.
4. Close bag and punch hole on the bag - above the seal.
5. Cut a long piece of yarn and thread it through the hole on the bag.
6. Tie off the yarn and wear as necklace to help the students remember the stages of the apple tree life cycle.

Helpful Tips:

- Punch holes in bags before hand (saves time)
- Cut pieces of yarn before hand (saves time)
- Make an assembly line and have the students come up in groups
 - You can discuss the different stages with each group
 - The other students can be doing a word search or crossword puzzle
- All materials are available at Wal-Mart or Craft Store (foam items)
- You can use real apples seeds or paper ones.

Anna's Corn

Objective: After completion of this lesson students will learn more about shelling corn by hand and about how corn is shelled today by combines. They will have the opportunity to take their corn home and start their own garden!

Common Core State Standards:

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

Next Generation Science Standards:

Life Cycles & Traits: 3-LS1-1; 3-LS3-2

Structure, Function & Information Processing: 4-LS1-1

Suggested Reading:

Anna's Corn by Barbara Santucci (ISBN-13: 9780802851192)

IAITC's Corn Ag Mag

Materials Needed:

- Pouches - www.giftsintl-us.com - Product ID: VB010204-01189 - packs of 25 for \$3.12
- Squirrel corn - Wal-Mart - about 6.5lbs for approximately \$9.00

Procedure:

1. Begin by reading the book Anna's Corn by Barbara Santucci.
2. Have students hold an ear of squirrel corn in their hands. Talk about the different types of corn using the Corn Ag Mag.
3. Students should shell (pull off) a few kernels of corn to place in their pouch. Remind students that before machinery took over the job, corn was shelled by hand.
4. Encourage students to take their corn home and plant it and watch it grow.



Corn Dissection

Objective: Students will understand the importance of corn as a crop in the United States. They will also understand each part of the corn kernel.

Common Core State Standards:

Language Arts: CCSS.ELA-Literacy.L.4.4; L.4.4a; RI.4.3; RI.4.5; RI.4.7

Next Generation Science Standards:

Interdependent Relationships in Ecosystems: 3-LS4-3; 3-LS4-4

Structure, Function and Information Processing: 4-LS1-1

Suggested Reading:

Awesome Agriculture: Corn in the Story of Agriculture by Susan Anderson & JoAnne Buggey (ISBN-13: 978-1-926781-03-7)

Corn Belt Harvest by Raymond Bial (ISBN-13: 9780395562345)

The Life and Times of Corn by Charles Micucci (ISBN-13: 9780618507511)

IAITC's Corn Ag Mag

Parts of a Corn Kernel:

Pericarp - waterproof outer covering that protects the food energy

Endosperm - largest part of the kernel where energy is stored; provides starch

Germ - contains the genetic information for the corn plant; used for corn oil

Tip Cap - attaches the kernel to the cob (ear); where water and nutrients enter the kernel from the cob

Materials Needed:

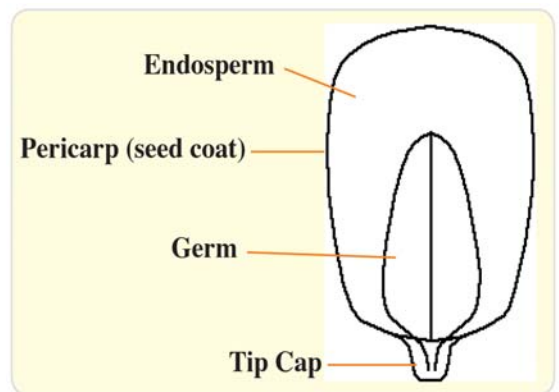
- Soaked Kernels
- Plastic Knives
- Magnifying glasses

Procedure:

1. Soak corn kernels 48 hours before dissection.
2. Pass out a few corn kernels to each student.
3. Students investigate the corn kernels with magnifying glasses.
4. Each student will dissect a corn kernel using a plastic knife.
5. Find and identify the four seed parts.
6. Draw a giant kernel on the blackboard and identify **pericarp**, **endosperm**, **germ**, and **tip cap**.

Lesson Extender:

1. Try dissecting soybeans! Soak soybeans 24 hours before dissection. Observe the similarities and differences!



From Tassel to Table Chain

Objective: Students will learn the process from tassel until table. They will also create a tassel to table chain.

Common Core State Standards:

CCSS.ELA-Literacy.RI.4.7; RI.4.10; SL.4.5

Next Generation Science Standards:

Structure, Function, and Processing: 4-LS1-1

Suggested Reading:

Corn by Gail Gibbons (ISBN-13: 9780823422456)

Corn: From Farm to Table by William Anton (ISBN-13: 9781567844689)

From Corn to Cereal by Roberta Basel (ISBN-13: 9780736842846)

IAITC's Corn Ag Mag



Materials Needed:

- One individual-sized cereal box
- Yarn (8 pieces, 6-8 inches each)
- Corn kernels
- Construction Paper (Yellow, Green, Pink, Brown, Blue, Red, Orange)
- Hole Punch
- Scissors

Procedure:

1. Have students make one of each item out of construction paper: kernel, corn, combine, cob, elevator, manufacturer, truck and grocery cart.
2. Instruct students to punch a hole on each side of the construction paper items, except the corn kernel, which needs the top punched.
3. Have students create a chain by placing the items in the following order:
 - Kernel: The corn plant starts with a kernel. Farmers plant kernels in the spring time. The kernel needs moisture and warm temperatures to grow.
 - Corn plant: During the spring and summer months, the corn plant grows. It develops leaves and a strong root system. Wind pollination fertilizes the silk. This fertilization is what creates an ear of corn. The corn plant continues to mature until mid-October.
 - Combine: When the kernels are at the right moisture level, farmers harvest the corn using a combine.
 - Cob: The kernels are shelled, which means they are taken off of the cob.
 - Elevator: These kernels can be stored on the farm or taken to a grain elevator. At the elevator, farmers receive money in exchange for the corn.
 - Manufacturer: Corn is processed to make products you use everyday, such as cereal. Check the ingredient label on your cereal box. You might see ingredients such as corn meal and corn syrup. A manufacturer makes and packages cereal.
 - Truck: Once the cereal has been made, it is transported to your grocery store by using trucks.
 - Grocery Store: A grocery store displays and sells a variety of products, so that you, the consumer, can pick out and purchase your cereal.
 - Cereal Box: Check the Nutrition Label. There is corn in your cereal box. Now, you know how it got there!

4. Have the students place all the items in their cereal box. Then, starting with the kernel, they can slowly pull shapes out and share how corn goes from the tassel to the table.

Note to Educator: It may be helpful to discuss each step of chain prior to doing this activity. Use this activity for an interest approach or to culminate a corn or food lesson.

Lesson Extender:

1. Begin by discussing different products made from corn and the processes involved in taking corn from the field and turning it into food and other products we use on a daily basis.
2. Have students list careers involved in each of those processes.
3. Cut out the cards on pages 14-20 and give one to each student.
4. Have the students put themselves in the order from tassel to table including the transportation in between stops.
5. As you discuss each card, talk about careers involved in each process, factors that may affect each step (ex: weather, weeds, insects, equipment failure, price of fuel, etc.), and what happens between the time the seed is planted to the time product is delivered to the grocery store.
6. After completing the interactive activity, have students fill out the flow chart on page 21 and then use the information they learned to write a 1 page paper about the process of taking corn from tassel to table.

Chemical Dealer

(fertilizer, herbicide, pesticide)



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Implement

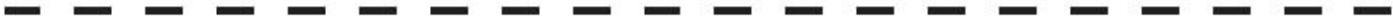
D
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Manufacturer



ROBATOR



Grocery
Store



Rail, Truck or Barge Transportation



Refinery



Seed
Dealer

Truck or Train
Transportation





Truck or
Wagon



Transportation



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Truck Transportation

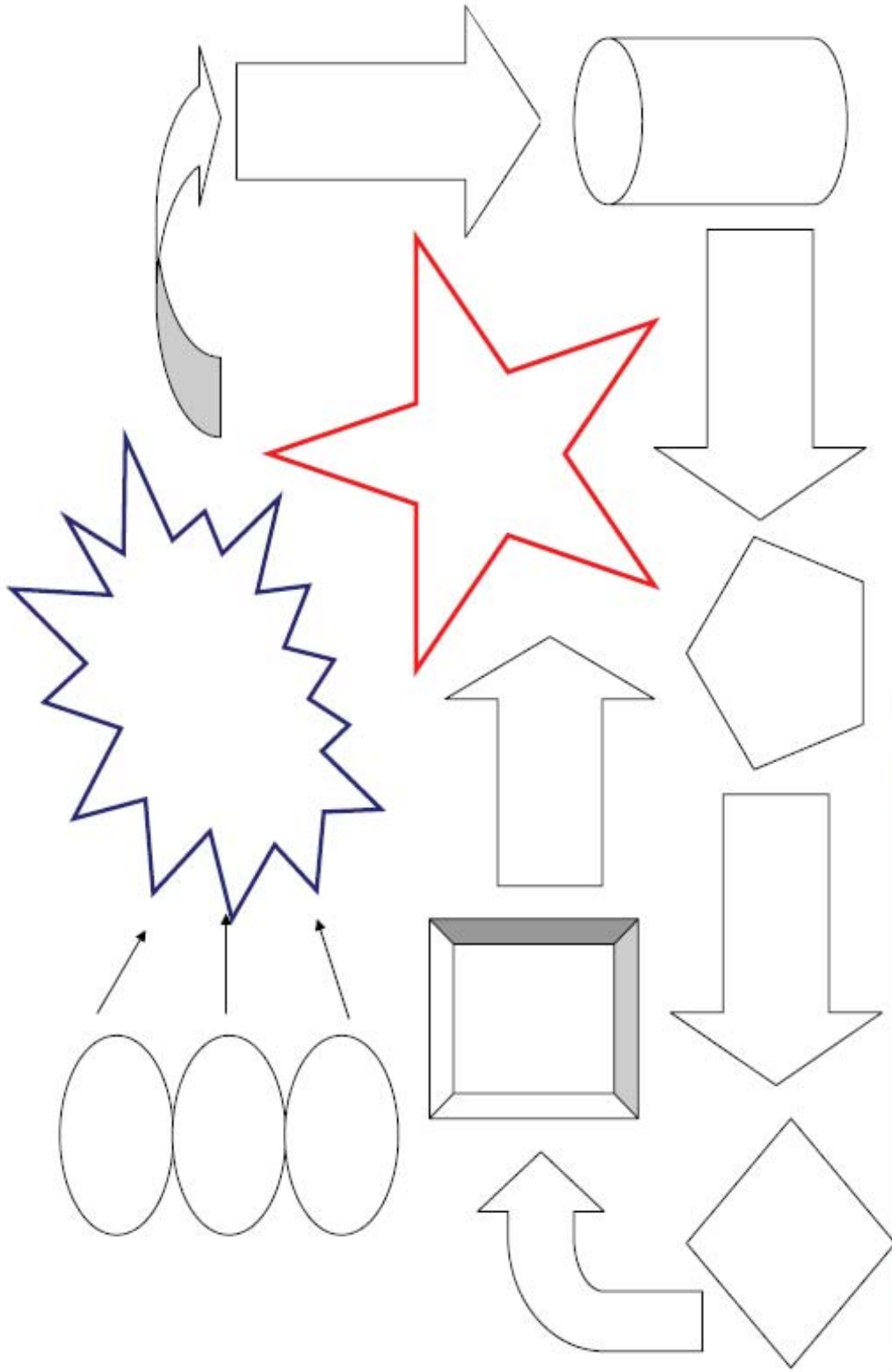


Truck Transportation



Name _____

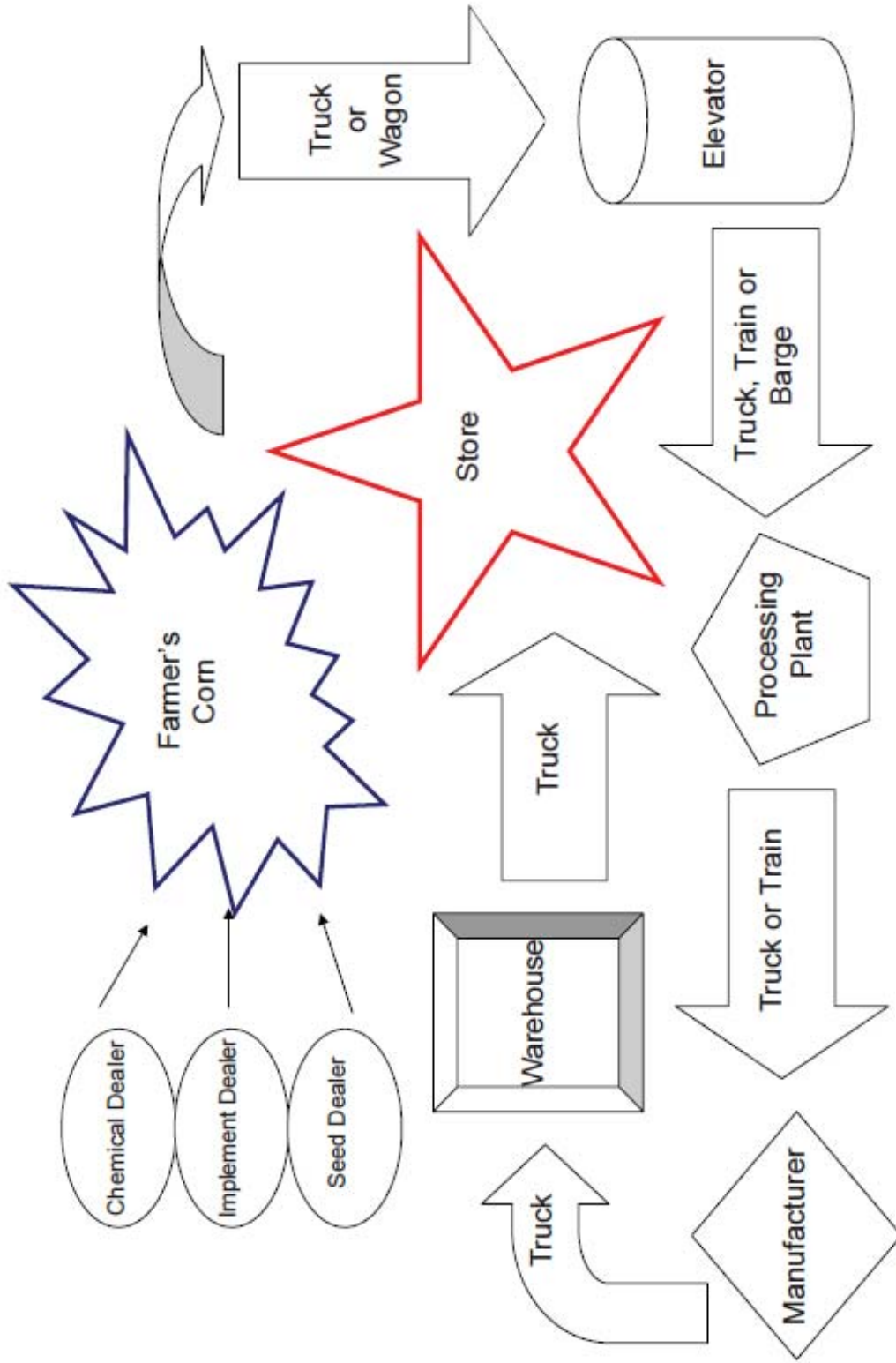
From Tassel to Table Flowchart Student Worksheet



Plant Magic Kit



From Tassel to Table Flowchart
ANSWER KEY



Plant Magic Kit



Popcorn Burst

Objective: Students will make a kernel of popped popcorn with a paper plate.

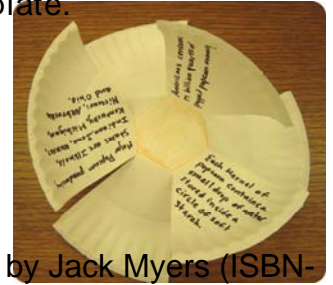
Common Core State Standards:

CCSS.ELA-Literacy.RI.3.3; RI.3.5; RI.3.7; RI.3.10

Suggested Reading:

What Makes Popcorn Pop?: And Other Questions About the World Around Us by Jack Myers (ISBN-13: 9781563974021)

IAITC's Corn Ag Mag



Materials Needed:

- 1 white paper plate
- Pencil
- Scissors
- Colored Pencils
- Popcorn Facts

Procedure:

1. Draw cutting lines on your paper plate as shown in the photo. (six sections with a hexagon in the middle)
2. Cut your plate on the lines.
3. Fold the plate “flaps” up and down to create a popcorn burst.
4. Write a popcorn fact on each flap such as:
 - Americans consume 17 billion quarts of popped popcorn annually.
 - Each kernel of popcorn contains a small drop of water inside soft starch.
 - Illinois is a major popcorn producing state.

Poppin' Up in Illinois

Objective: This activity highlights the leading popcorn producing states as well as important popcorn locations in Illinois. After reviewing production numbers, students will create a visual (graph or map) illustration of the top popcorn-producing states and locations in Illinois.

Common Core State Standards:

CCSS.ELA-Literacy.RI.4.5; RI.4.7; RI.4.10; W.4.2; W.4.4; Math.Content.6.NS.B.2

Suggested Reading:

The Popcorn Book by Tomie dePaola (ISBN-13: 9780823405336)

Popcorn! by Elaine Landau (ISBN-13: 9781570914430)

Learn how a bill comes a law at: <http://kids.clerk.house.gov>

Background Information:

Popcorn is a whole grain maize product, referred to as *zea mays everta*. Popcorn kernels are the only corn kernels that can pop. Popcorn pops because its kernels contain a small amount of water in the starchy center. When heated, this water boils and turns to steam, which creates pressure within the kernel. This causes the kernel to swell until steam shoots out. As the steam escapes, the kernel turns inside out. The kernels expand to 30 to 40 times their original size when popped.

Just like corn, popcorn is mature when the stalk and leaves are brown and dry. The kernel is hard and there is a black layer at the tip of the kernel. This layer indicates that the kernel is no longer requiring nutrition from the plant.

Popcorn can be harvested in two ways. The first is ear-harvesting, where the whole ear of corn is cut and stored for eight-12 months, until the moisture levels in the kernels reach optimum levels. Then, the kernels are stripped from the cobs and any kernels that are too small to pop are removed. Popcorn can also be harvested using a combine. The combine picks and shells the popcorn. Then, the kernels are dried with hot forced air, packed and distributed for sale.

The Corn Belt states of the United States produce the majority of popcorn. In Illinois, there are 102 farms that grow popcorn on a little over 26,000 acres, which makes Illinois the third largest grower of popcorn. Mason County is the leading popcorn producer in Illinois. Experts estimate that Native Americans in Illinois started growing corn about 100 A.D.

Second and third grade students at Cunningham Elementary in Joliet, Illinois proposed popcorn as a state symbol. In 2003, popcorn became the Official Illinois Snackfood. A law must be passed in order to name something as a state symbol. So, a bill must be written to propose a state symbol. The bill must then be approved by state Legislature. This was a great accomplishment!

Popcorn is not just popular in Illinois. Each American eats 51 quarts of popcorn per year.

Activity 1 Procedure:

1. Share U.S. crop production maps with students. These maps are available from the USDA's website at: [http://www.nass.usda.gov/Charts and Maps/A to Z/](http://www.nass.usda.gov/Charts_and_Maps/A_to_Z/)
2. Discuss how the maps show the products that are important to a particular area. Be sure to highlight Illinois and check out neighboring states or states in other parts of the country.
3. Have students list the crops produced in Illinois.
4. Students may be surprised to learn that popcorn is also grown in Illinois. Ask students to guess where Illinois ranks in popcorn production. Record their predictions, but do not reveal the answer.
5. Provide students with the "Popcorn Geography" worksheet as well as a U.S. map copied on 11X17 paper. Ask them to complete the first activity.
6. After reviewing the students' maps for accuracy, ask them to write a paragraph describing the meaning of the maps they created.

Activity 2 Procedure:

1. Now that students have learned where Illinois ranks, they will discover important popcorn locations in Illinois.
2. Provide students with an Illinois map as well as access to the Internet or reference books. Ask students to complete Activity 2 on the Popcorn Geography worksheet.
3. Review students' maps and location descriptions.

Additional Activities:

- Do the Popcorn Map activity as a class. Print the U.S. map on a transparency. Using an overhead projector, have a few students trace the map onto a large piece of paper. Students can use popped popcorn instead of kernels.
- Students can create a bar graph illustrating the top popcorn-producing states. Have them create their graph using popped popcorn on colored paper.

Activity 1

The chart below shows eight U.S. states in which the most popcorn is grown. If 1 kernel of popcorn = 10,000,000 bushels of popcorn, how many kernels would you need to show how many bushels of popcorn are grown in each state below? Write the number of kernels next to each state. Then, glue the kernels to a U.S. map to create a “U.S. Production By State” map. Be sure to rank the states to find the leading producer of popcorn in the United States. On the back of this worksheet, write a paragraph describing what your map shows.

*Please note: You may need to round the amount of kernels to the nearest whole number.

State Name	Popcorn Production (in bushels)	Number of Popcorn Kernels	Rank
Nebraska	295,000,000	30 kernels	
Missouri	18,000,000		
Indiana	221,000,000		
Iowa	35,000,000		
Illinois	115,000,000		
Ohio	110,000,000		
Kentucky	19,000,000		

Source: 2007 Census of Agriculture; Available on the Internet at: <http://www.nass.usda.gov/>

Activity 2

Use the clues provided, a map, the Internet, and other resources to find the important popcorn locations in Illinois. Once you have found the location, label it, and glue a popcorn kernel to mark its spot on the Illinois map. When you are finished, you will have a “Illinois Popcorn” map. Then, write a description for each location using cardinal directions.

- Located in the northeastern part of Illinois, second and third grade students from this city proposed popcorn as our state snackfood. Popcorn became The Official Illinois Snackfood in 2003. This city is named after a great explorer who partnered with Marquette.
- Known as the “Windy City,” this Illinois city is the only place where Cracker Jacks are made and it is where the first popcorn machine made its debut. This city sits along Lake Michigan.
- It was in this city that the legislation declaring popcorn as The Official Illinois Snackfood was passed. The Sangamon River is near this city.
- This county is the leading popcorn producer in Illinois. Some of its neighboring counties are: Menard, Tazwell, Fulton, and Cass.
- Known as the “Popcorn Capital of the World,” this town is located in the center of Gallatin County. This county has both Indiana and Kentucky at its borders.

Poppin' Up In Illinois

Answer Key

Activity 1

State Name	Popcorn Production	Number of Popcorn	Rank
Nebraska	295,000,000	(29.5) 30 kernels	1
Missouri	18,000,000	(1.8) 2 kernels	7
Indiana	221,000,000	(22.1) 22 kernels	2
Iowa	35,000,000	(3.5) 4 kernels	5
Illinois	115,000,000	(11.5) 12 kernels	3
Ohio	110,000,000	11 kernels	4
Kentucky	19,000,000	(1.9) 2 kernels	6

Activity 2

- **Joliet, Illinois:** Located in the northeastern part of Illinois, second and third grade students from this city proposed popcorn as our state snackfood. Popcorn became The Official Illinois Snackfood in 2003. This city is named after a great explorer who partnered with Marquette.
- **Chicago, Illinois:** Known as the “Windy City,” this Illinois city is the only place where Cracker Jacks are made and it is where the first popcorn machine made its debut. This city sits along Lake Michigan.
- **Springfield, Illinois:** It was in this city that the legislation declaring popcorn as The Official Illinois Snackfood was passed. The Sangamon River is near this city.
- **Mason County:** This county is the leading popcorn producer in Illinois. Some of its neighboring counties are: Menard, Tazewell, Fulton, and Cass.
- **Ridgeway, Illinois:** Known as the “Popcorn Capital of the World,” this town is located in the center of Gallatin County. This county has both Indiana and Kentucky at its borders.

Popcorn Kernel Math

Objective: This activity features information about popcorn hybrids and asks students to compute fractions and percentages.

Common Core State Standards:

CCSS.Math.Content.3.NF.A.3.B; 6.RP.A.3.c

Background Information:

Popcorn seeds are bred to produce desirable traits. For the farmer, desirable traits may include stalk strength and grain color. For the average consumer, desirable traits are taste and successful popping. Plant breeders combine the pollens of two plants that have these traits to produce popcorn that both farmers and consumers enjoy. This popcorn is called a hybrid, or an offspring that is produced by crossing two varieties of a plant. The result is many types of popcorn.

Materials Needed:

- Popcorn Kernel Math Worksheet
- Red marker, crayon or colored pencil
- Yellow marker, crayon or colored pencil

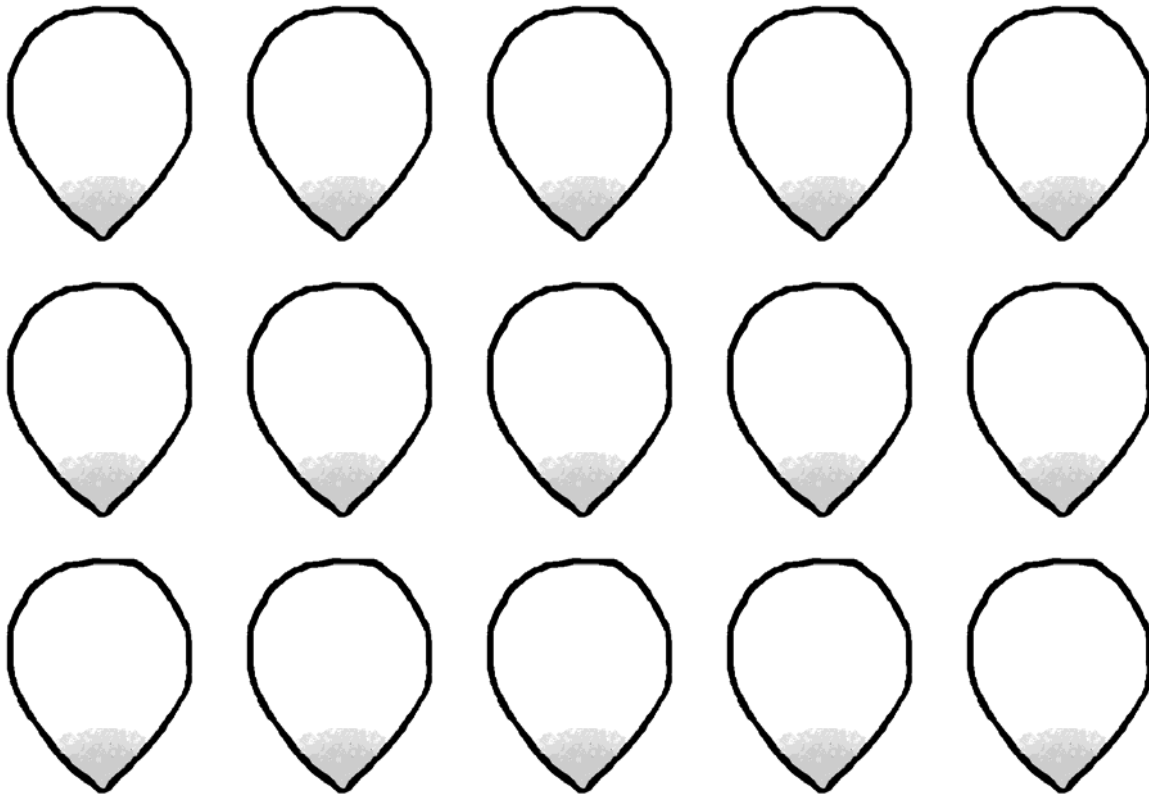
Procedure:

1. As a class, create a definition for the word “trait.” Write this definition on the chalk board.
2. Ask students, “For a farmer, what traits would be desirable in a popcorn plant?” Write the list on the chalk board. Possible answers might include: stalk strength, grain color, plant size, high yield, and disease resistance.
3. Ask students “What traits do consumers look for in popcorn?” Write this list on the chalk board. Possible answers might include: good taste, successful popping, kernel size, and a lack of hulls.
4. As a class, select a trait from the farmer’s list and a trait from the consumer’s list. Ask students how popcorn with both traits might be produced.
5. Share the background information with students. It may be helpful to have different examples of popcorn on hand to show students. Older students could further explore hybrids and pollination.
6. Have students complete the “Popcorn Kernel Math” worksheet. Review answers and then do some more problems as a class. Use a higher amount of popcorn kernels and more varieties.
7. Discussion questions: How do hybrid varieties of popcorn benefit both the farmer and the consumer?

Extended Activity:

- Combine hybrid popcorn kernels in several clear plastic containers. Be sure to use different colored kernels as well as varying amounts of each kernel. Provide groups of 3-4 students with a container of popcorn kernels. Ask them to calculate the probability of drawing each color of kernel in the container. For challenge, ask students to calculate the probability of drawing each color when five kernels are selected at a time.

Popcorn Kernel Math



Before answering the questions:

Color 10 popcorn kernels red.

Color 5 popcorn kernels yellow.

What fractional part of the popcorn is red?

What fractional part of the popcorn is yellow?

If you colored only 8 kernels red, what is its fractional part?

If you colored 5 kernels brown, 3 kernels purple, and the other 7 orange, then what is the fractional part and percentage of each?

Challenge Problem: There are 75 total popcorn kernels in a jar. 20 kernels are red, 15 are yellow, and 40 are purple. On the back of this worksheet, create a pie chart to show the percentages of each color.

Lip Balm

Objective: Students will learn how to make lip balm from soybean products.



Common Core State Standards:

CCSS.Math.Practice.MP.4; MP.5; 5.MD.A.1; 5.MD.C.3

Next Generation Science Standards:

Matter and Its Interactions.5-PS1-2; 5-PS1-3; 5-PS1-4

Suggested Reading:

The Super Soybean by Raymond Bial (ISBN-13: 978-0-8075-7549-9)

IAITC's Soybean Ag Mag

Materials Needed:

- 1 lip balm container per student
- 3.5 ounces (100g) beeswax
- Stir stick
- Beaker
- 1 bottle (3.7ml) of cooking flavoring oil (optional)
- 1-1/2 cups (360 ml) soybean oil
- Hot plate
- Hot pad

This recipe will make enough to fill 30 containers about 1/2 full.

Procedure:

The block of beeswax can be easily broken up into pieces by placing the block in a large freezer bag and having the students break it up with a hammer. Weigh 100g of the small pieces in a 600 ml beaker. Put the beaker with the beeswax on the hot plate. Turn on the hot plate before adding soybean oil so that students can see the wax begin to melt. With the hot plate on low, heat the mixture of beeswax and soybean oil, stirring occasionally. When the beeswax is completely melted, turn off the heat. If you choose to add flavoring, add the contents of the bottle (3.7ml) at this time and stir until everything is completely mixed. Ask the students why they think the beeswax and oil mixed. Explain that beeswax is an oily substance and, therefore, mixes with oil.

Pour the liquid into the lip balm containers, filling them about 1/2 full. Allow each student to take his/her container of lip balm and observe the changes as the liquid cools. What is happening as the liquid cools? (It is getting harder.) Now that the liquid is turning solid, where is the oil? (Mixed with the beeswax.) Discuss solids and liquids with the students.

When the lip balm has cooled, discuss its uses. We use lip balm to prevent chapping and to moisturize our lips. The oil and wax in the lip balm create a protective seal that prevents our lips from chapping (drying out).

Lesson Extender:

Students can form a "mini" manufacturing company for types of fundraisers. Conduct flavoring and cost analysis to find out how to make and sell their product. By listing ingredients such as soybean oil, beeswax, and other information identified on flavoring oils, students can generate labels for their jars or twist-up tubes.

Edamame vs. Conventional Soybeans

Objective: Edamame, soybeans, it's all the same, right? Not quite. There are many varieties of soybeans grown for different purposes. Plant both types and see the difference!

Common Core State Standards:

CCSS.ELA-Literacy.RI.4.5; RI.4.6; RI.4.9; RI.4.10; W.4.2

Next Generation Science Standards:

Structure, Function, and Information Processing: 4-LS1-1

Suggested Reading:

[Auntie Yang's Great Soybean Picnic](#) by Ginnie Lo (ISBN-13: 9781600604423)

[Soybeans in the Story of Agriculture](#) by Susan Anderson & JoAnne Buggey (ISBN-13: 9780981133522)

IAITC's Soybean Ag Mag

Background Information:

Edamame



Edamame are soybeans, but they are different than most of the soybeans you see growing in the fields. Edamame are food grade soybeans picked when they are still green and immature. They are generally larger-seeded, sweeter, smoother and more digestible than grain soybeans. Edamame Gardensoy varieties form seeds 50–100% larger than the common grain types but yield only 60–80% as well.

Conventional/
Grain Soybeans



Conventional soybeans are feed grade, or grain, soybeans and are harvested when the soybeans are dry and mature. These soybeans are processed and used in products like livestock feed, pet food, soy milk, cereal, body lotion and biodiesel.

Cultivation:

- Soybeans should be sown after all danger of frost has passed and the soil has warmed. In the Midwest, soybeans are usually planted between May and mid-June. The vegetable/edamame varieties are no different.
- Once the soil is warmed, seeds should be planted in full sun, about one inch deep, two to three inches apart in rows that are spaced 15-30 inches apart. Soybeans planted densely will form a canopy, which will help control weed growth. The soil should be kept moist, not wet, until the plants are established.
- A mature edamame variety is about 2 to 3 feet tall. The seeds/pods are harvested by hand once the pods are filled out, and are used in this "green" stage. They are tender and cook quickly. Conventional/grain soybeans can grow to nearly 5 feet tall. They are harvested by a machine, called a combine, when the plant and pods have dried. The ideal moisture content of the soybean inside is around 13%. These soybeans are processed into soybean meal or oil to be used in other products.

Procedure:

- Give students soybean seeds from a garden/edamame variety as well as a conventional/grain variety.
- Have students keep a soybean journal to compare and contrast the two varieties of plants. The date and height of the plant should be noted on each journal entry. Students should measure items in both the vegetative and reproductive stages. Use the following as a guide:
 1. Date of planting
 2. Emergence
 3. Appearance of first trifoliolate
 4. Beginning flowering
 5. Full pod
 6. Full seed (green seed fills pod)
 7. Harvest date (*this will vary—edamame is harvested in an immature state-conventional are harvested when fully mature & dry*)

Lesson Extenders:

- Use the IAITC Beanie Baby activity to watch soybeans germinate in a baggie! You can find it under Teacher Resources on our website: www.agintheclassroom.org
- Have student taste both prepared edamame and roasted soy nuts. Compare and contrast the two types of soybeans.
 - ⇒ Boil the edamame in salted water for 5 minutes. Drain and rinse in cold water. Add salt to taste.
 - ⇒ Find a roasted soy nut recipe at <http://www.thumboilseed.com/recipes/snacks/roasted-nuts.htm>

Three Sisters Harmony Tambourine

Objective: The students will learn that planting a Native American Three Sisters Garden benefits three plants: corn, beans & squash. The corn stalk serves as a pole for the beans, the beans help to add the nitrogen to the soil that the corn needs, and the squash provides a ground cover of shade that helps the soil retain moisture. They will create a tambourine to celebrate their harmony.

Common Core State Standards:

CCSS.ELA-Literacy.RI.3.1; RI.3.7; RI.3.8

Suggested Reading:

Awesome Agriculture: Corn in the Story of Agriculture by Susan & JoAnne Buggey (ISBN-13: 978-1-926781-03-7)

Awesome Agriculture: Soybeans in the Story of Agriculture by Susan Anderson & JoAnne Buggey (ISBN-13: 978-1-926781-03-7)

Corn by Gail Gibbons (ISBN-13: 978-0823422456)

Oh Say Can You Seed? by Bonnie Worth (ISBN13: 9780375810954)

One Bean by Anne Rockwell (ISBN-13: 978-0802775726)

Seed Soil Sun by Cris Peterson (ISBN-13: 978-1-59078-713-7)

IAITC's Pumpkin Ag Mag

Materials Needed:

- 2 white paper plates
- Stapler and staples
- Markers
- Corn, beans, and squash seeds

Procedure:

1. Have the students staple the two paper plates together leaving an opening to insert the seeds. Once the seeds are inserted, staple the plate closed. The staples need to be close so the seeds do not fall out.
2. Have the students write "Three Sisters Harmony Tambourine" on the plate.
3. Have the students draw pictures of corn, squash, and beans on the plate.
4. Now your tambourine is complete. You may want to plant a Three Sisters Garden at your school or home. You can learn how at <http://www.nativetech.org/cornhusk/threesisters.html>.

Can you find my pumpkin?

Objective: After completing this activity, students will be more familiar with reading and following directions.

Common Core State Standards:

CCSS.ELA-Literacy.SL.K.2; SL.K.5; W.K.2

Suggested Reading:

Pumpkin Jack by Will Hubbell (ISBN-13: 9780807566664)

Pumpkin Circle: The Story of a Garden by George Levenson (ISBN-13: 9781582460789)

IAITC's Pumpkin Ag Mag



Materials Needed:

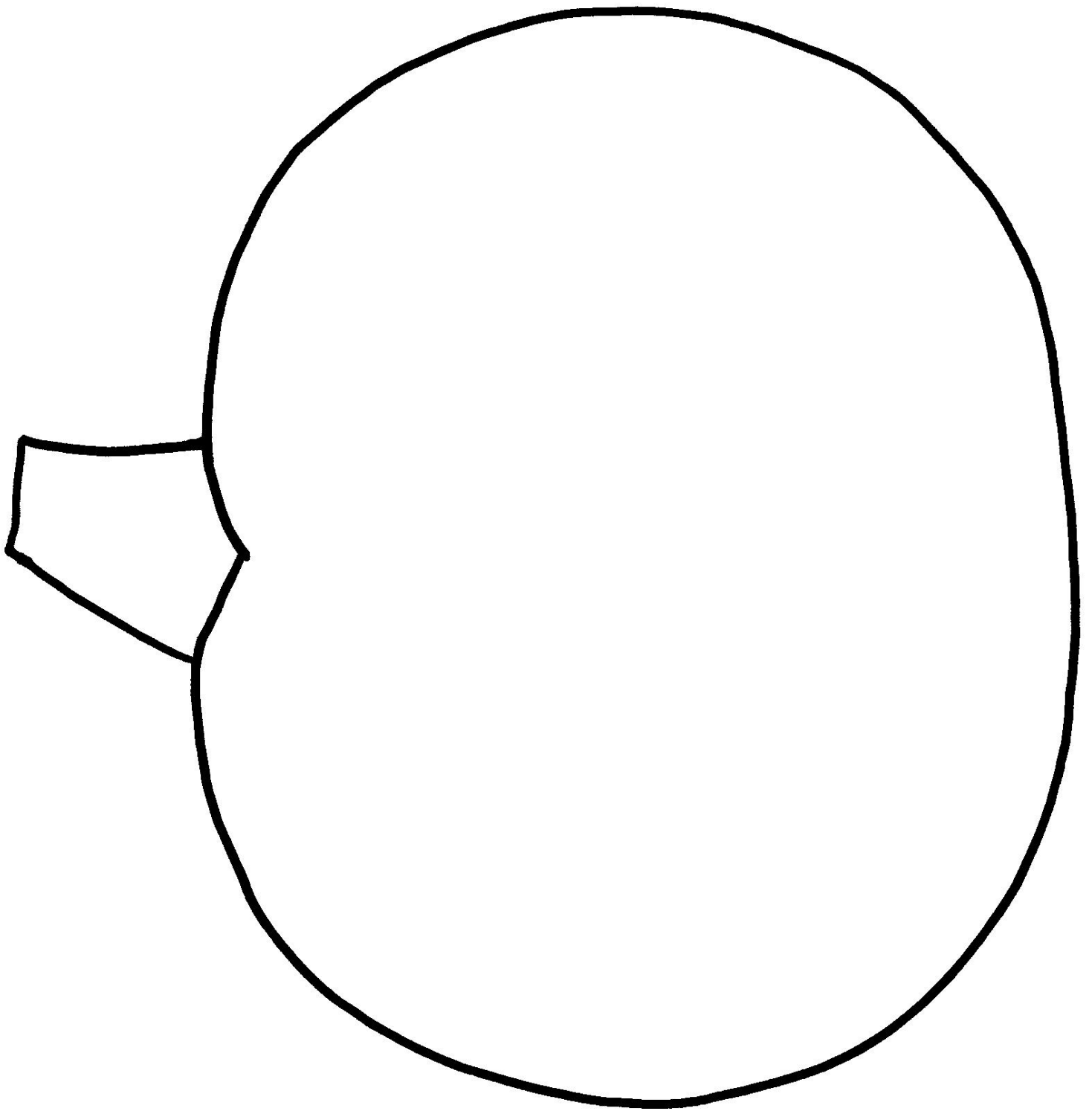
- Scissors
- Markers or crayons

Procedure:

1. Begin by reading one of the suggested books aloud to the class.
2. Copy the blank pumpkin on orange construction paper. Each student should receive one pumpkin.
3. Have the students follow the glyph instructions below:
 - Number of lines = Number of letters in my first name
 - Eyes = Same color as my eyes
 - Nose = Triangle for boy, Circle for girl
 - Teeth = The number of teeth I have lost
 - Stem = My favorite color

Lesson Extender:

1. Pick a student and then see if everyone can find that student's pumpkin by reading the glyph directions. (To make it easier, divide students up into pairs to see if they can find each other's pumpkin by asking their partner questions pertaining to the glyph. For example: What color eyes do you have?)



3-D Pumpkins

Objective: Students will learn many facts about pumpkins while creating a visual display of a mini pumpkin.



Common Core State Standards:
CCSS.ELA-Literacy.RL.4.3; W.4.2

Next Generation Science Standards:
Animals, Plants & their Environment: K-LS1-1
Life Cycles & Traits: 3-LS1-1; 3-LS3-1

Suggested Reading:
[Too Many Pumpkins](#) by Linda White (ISBN-13: 9780823413201)
IAITC's Pumpkin Ag Mag

Materials Needed:

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

Procedure:

1. Begin by reading the Pumpkin Ag Mag.
2. Cut 3 strips about 1 in. wide down the short side of the orange paper.
3. Write a pumpkin fact on each strip.
4. Holding the strips together in a stack, use a paper punch to make 3 holes in the strips. Punch one in the middle and one 1/2 inch from each end.
5. Cut strips of green construction paper into 1 inch by 1 inch squares. Punch a hole in the middle of these squares. This will be the pumpkin's stem.
6. Still holding the strips together, place the stem on top of the middle hole and put a paper fastener through the stem and the orange strips of paper in the middle hole.
7. Bring together the ends of the long orange strips and fasten them with a paper fastener.
8. Spread out the paper strips to form a pumpkin.

Another Variation: Trace your hand for the leaf, keeping your fingers together. Cut strips of green and curl them with a pencil for vines. Finish pumpkin by completing steps 7 and 8.

Pumpkin Chain

Objective: Students will learn the process from seed to pumpkin while creating a visual display of the pumpkin chain.

Common Core State Standards:

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

Next Generation Science Standards:

Animals, Plants & their Environment: K-LS1-1

Weather & Climate: 3-ESS2-1

Life Cycles & Traits: 3-LS1-1; 3-LS3-1

Suggested Reading:

The Legend of Spookley the Square Pumpkin by Joe Troiano (ISBN-13: 9781435120884)

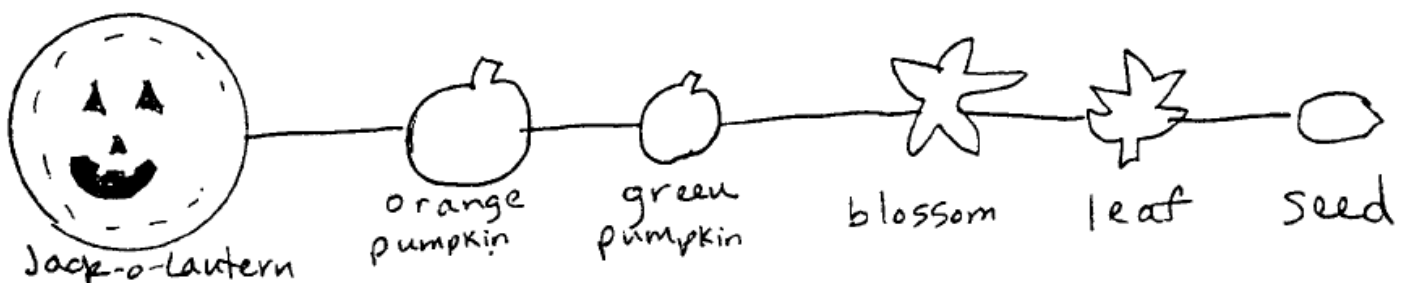
IAITC's Pumpkin Ag Mag

Materials Needed:

- 2 red paper plates per student (or white plates to be colored)
- Crayons
- Glue
- Construction paper (yellow, pink, brown and green)
- Pumpkin Chain templates from <http://www.agintheclassroom.org>
- Hole punch
- Tape
- Yarn
- Stapler
- Scissors

Procedure:

1. Cut each item out of construction paper: seed, tree, blossom, bee, little green apple. Punch a hole on each side of the items you made with construction paper. The brown seed only gets one hole punch.
2. Glue two red paper plates together around 2/3 of the edge. Leave the other 1/3 open. Allow time for it to dry. You can also staple plates together depending on age of student.
3. Tape or staple a piece of yarn to the inside of the paper plates and extend the yarn out of the opening.
4. Add a stem and leaf to the red paper plates to make them look like an apple.
5. Tie the little green apple to the yarn coming out of the apple. Tie the bee to the little green apple. Tie the blossom to the bee. Tie the bee to the tree. Tie the tree to the seed. These should all form a chain.
6. Tuck the green apple, bee, blossom, tree, and seed into the apple. Starting with the seed, slowly pull shapes out of the apple and tell the story of how apples grow.



Pumpkin Charm

Objective: Illinois is the home of the PUMPKIN! Illinois farmers grow more pumpkins than anywhere else in the world. Most of the pumpkin processing occurs in Morton, IL, which is known as the “Pumpkin Capital of the World.” Students will explore how pumpkins grow with this pumpkin charm.

Common Core State Standards:

CCSS.ELA-Literacy.RI.2.5; RI.2.7; RI.2.10; SL.2.5

Suggested Reading:

Pumpkins by Jacqueline Farmer (ISBN-13: 9781570915581)

IAITC’s Pumpkin Ag Mag

Materials Needed:

- Sand
- Pumpkin seeds
- Confetti flowers
- Confetti insects
- Blue pony beads
- Green pony beads
- Yellow pony beads
- Confetti pumpkins
- Orange crinkle paper
- Yarn
- Small zipper-seal baggie

Procedure:

1. Put the following items inside the small zipper-seal baggie:
 - **Pinch of sand:** Pumpkins grow best in a sandy soil.
 - **Pumpkin seed:** You can eat a pumpkin seed or plant it!
 - **Confetti flower:** Pumpkins grow on a vine, but through pollination they start by growing inside the flower.
 - **Confetti insects:** Insects like bees help pass pollen from one pumpkin flower to another. Many insects help gardens grow.
 - **Blue pony bead:** Pumpkins need water to grow. Pumpkins are 90% water.
 - **Green pony bead:** A tiny green pumpkin starts to grow at the base of the flower.
 - **Yellow pony bead:** Sunlight changes the pumpkin from green to yellow.
 - **Confetti pumpkin:** Sunlight changes the pumpkin from yellow to orange. The orange color means the pumpkin is ready to pick!
 - **Orange crinkle paper:** Pumpkins contain pulp and seeds.
 - **Pumpkin seed:** Plant the seeds in the ground and start the life cycle over again!
2. Loop a string through the hole and tie it off. Now, you have a pumpkin charm to wear around your neck. Be sure to share everything you know about PUMPKINS!

Pumpkin Pie in a Bag

Objective: Students will read the Pumpkin Ag Mag and learn all about Pumpkins while enjoying a snack that comes from Pumpkins.

Common Core State Standards:

CCSS.ELA-Literacy.RI.3.1; RI.3.2; Math.Content.3.MD.A.2

Next Generation Science Standards:

Structures and Properties of Matter: 2-PS1-1; 2-PS1-3



Suggested Reading:

How Many Seeds in a Pumpkin? By Margaret McNamara (ISBN-13: 9780375840142)

IAITC's Pumpkin Ag Mag

Materials Needed:

- 1 gallon Ziploc freezer bag
- 1 teaspoon ground cinnamon
- 1/2 teaspoon ground ginger
- 2 packages (4 serving size) instant vanilla pudding mix
- 1 can (15 ounces) 100% pure pumpkin
- 2 2/3 cups cold milk
- Scissors
- Graham cracker crumbs
- 1 can whipped topping
- Can opener
- 26 small cups & spoons

Procedure:

1. Combine the milk and instant pudding in the Ziploc bag.
2. Remove the air and Ziploc shut.
3. Squeeze and knead with hands until blended for 1 minute.
4. Add the pumpkin, cinnamon, and ginger.
5. Remove the air and Ziploc shut.
6. Squeeze and knead with hands until blended for 2 minutes.
7. Place 1/2 tablespoon of graham cracker crumbs in the bottom of small cups.
8. Cut the corner of the gallon freezer bag and squeeze pie filling into cups.
9. Garnish with whipped topping.
10. Add a spoon. Serve and enjoy.
11. Discuss pumpkin production while students are eating.

Yield - 25 students and 1 teacher.

Ingredients can be divided by 4 or 5 for students to work in small groups. Make sure to use math to get the correct batch!

What's Inside a Pumpkin?

Objective: Students will make a booklet to learn the inside parts of a pumpkin.

Common Core State Standards:

CCSS.ELA-Literacy.RI.2.5; RI.2.7; RI.2.10; SL.2.5

Suggested Reading:

The Pumpkin Blanket by Deborah Turney Zagwyn (ISBN-13: 9781883672591)

IAITC's Pumpkin Ag Mag

Materials Needed:

- Orange paper plates
- White paper plate
- Orange yarn
- Yellow yarn
- Pumpkin seeds
- Hole punch
- Scissors
- Marker
- Glue
- Tape

Procedure:

1. Give each student 5 plates. They will make a booklet consisting of a cover page and four additional pages.
2. Cover page: students should write "What's Inside a Pumpkin?"
3. Page 1—Shell: Students should cut the outside of one of the orange plates and glue it on top of a white paper plate. Have the students write on the white plate, "Pumpkins have a shell. The shell is discarded for pie pumpkins, but saved for carving pumpkins."
4. Page 2—Pulp: Students should write on an orange plate, "Pumpkins have pulp. The pulp is used to make pie filling." Then ask them to glue yellow and orange yarn to the plate to make it look like pulp.
5. Page 3—Seeds: Students should write on an orange plate, "Pumpkins have seeds. Seeds are used to plant more pumpkins but they can also be eaten." Then have the students glue some pumpkin seeds to the plate.
6. Page 4—Summary: Students should write on an orange plate, "Pumpkins have a shell, pulp and seeds inside!" Then have them glue a photo of a pumpkin to the plate.
7. Have the students hole punch each plate on the left side and use a piece of yarn to tie the 5 plates together. Now the students can read their booklets and explain the parts of a pumpkin.

The Football Charm

Objective: The football charm shows how agriculture is a part of the sport of football. It will contain little representations of the many different parts of agriculture that are in football. This charm could be made during your local high school's football season and your students could wear them to the games.

Common Core State Standards:

CCSS.ELA-Literacy.RI.3.5; RI.3.7; RI.3.10

Suggested Reading:

IAITC's Corn, Dairy and

Soybean Ag Mag's



Materials Needed:

- Cotton balls
- Confetti footballs
- Grass seed
- Soybeans
- Ticket stubs
- Corn kernels
- Confetti cows
- Confetti pigs
- Peanuts
- Popcorn kernels
- Whole wheat flour
- Gum
- Yarn
- Small zipper-seal bags

Procedure:

1. To start use little zipper style bags. Then include these items. If one item has two objects that represent it use one or the other or both:

- Uniforms – Are made from cotton, so first add a small **cotton ball**.
- Football – Most footballs used today are covered with a leather outside made from cows. Use **confetti footballs or confetti cows**.
- Turf Grass – Most football fields use natural grass, professional, and high school, but some of the professional teams are using an artificial grass. Here put **grass seed** into the bag.
- Tickets, Programs, and Schedules – These are printed on paper from trees and possibly use soy ink made from soybeans. To represent this use **soybeans** and actual **ticket stubs**.
- Tape and Bandages – Corn dextrines and cattle gelatins are used as adhesives and binding agents. Use **corn kernels** and **cow confetti**.

2. Foods eaten at the game are also connected to agriculture:

- Soda – Sweetened with corn syrup. Use **corn kernels**.
- Hot Dogs – pork/beef in a wheat bun with relish from cucumbers. Use **pig confetti**.
- Peanuts and Popcorn – both grown by farmers. Use actual **peanuts and popcorn**.
- Nachos and Cheese – corn flour with cheese made from dairy cows. Here use **corn kernels and cow confetti**.
- Soft Pretzels – wheat flour and vegetable oil. Use **whole-wheat flour** so that it doesn't get mixed up with the cornstarch.
- Chewing gum – base comes from the tropical gum tree with sugar and corn syrup added as sweeteners. Use an actual **piece of gum**.

3. After everything is in the bag, seal it up and use yarn to make a necklace.

Illinois Agriculture in the Classroom

1701 Towanda Ave.

Bloomington, IL 61701

Phone: 309-557-3334

Fax: 309-557-2098

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