Exploring CORN!

EXPLORING CORN!

There are six different types of corn throughout the world. This IATIC booklet offers cross-curricular activities for students to explore dent corn, sweet corn, and popcorn. Also included is information about broom corn, a type of sorghum, which is in the same family as corn. The booklet contains a brief overview of each and highlights their importance as an Illinois commodity.

Have fun EXPLORING Corn!

TABLE OF CONTENTS

CORN HISTORY

CORN'S JOURNEY THROUGHOUT THE WORLD: 4-5
CORN IS MAIZE: 6
CORN TIMELINE: 7-10

DENT CORN

FIELD CORN INTRODUCTION: 11
FIELD CORN PRODUCTION IN THE UNITED STATES: WHERE DOES ILLINOIS RANK?: 12-15
ILLINOIS CORN IS EXPORTED ALL OVER THE WORLD: 12, 16-17
CORN IN MY FOOD: 18
CORN LEGENDS: 19-20

POPCORN

POPCORN INTRODUCTION: 21
POPCORN POPPIN' UP IN ILLINOIS: 22-24
POPCORN KERNEL MATH: 25-26

SWEET CORN

SWEET CORN INTRODUCTION: 27
SOME SWEET TRAITS: 28-29
TO MARKET, TO MARKET: TRENDS IN THE SWEET CORN MARKET: 30-33

BROOM CORN

BROOM CORN INTRODUCTION: 34
BROOM CORN IS SWEEPING THE WORLD!: 35-37
THE GREAT SWEEP OFF: 38

EXPLORING CORN!

The following lessons and activities are correlated to the Illinois State Learning Standards and Assessment Framework.

A visual key has also been created and used with each activity to indicate its subject area. The topics include: hands-on, science, health and nutrition, reading, math, social studies, writing, and art. Use this key to help select lessons and activities to best meet your classroom's needs.

Hands-on

Writing

Science

Reading

Social Studies

Art

Math

Health and Nutrition

Corn's Journey Throughout the World

Objective:

Students will explore corn's origins and learn how it was exchanged between groups throughout the world.

Background Information

Corn is a domesticated plant of the Americas. Its history began in Central America over 7,000 years ago. In the Valley of Tehuacan in Puebla, Mexico, the native people ate Teosinte or Zea Mexicana. The Mayan, Aztec, and Inca Indians of Central and South America used every part of the corn plant. Immature corn was eaten as a fresh vegetable, while the dry kernels of corn were ground into flour.

Corn then spread to North America where the natives used corn for food and trading. The Native Americans called corn, maize. As Native Americans moved north, they brought corn with them. In fact, Native Americans grew corn long before the arrival of European explorers.

From the Americas, corn traveled to the Caribbean. The natives gave Christopher Columbus corn to take home to Spain in 1493. This was known as the Great Exchange. Columbus learned about other plants, while the Europeans introduced several new plants to the Native Americans. Plants native to New World included: squash, strawberries, corn, pumpkins, peanuts, and pineapples. Plants native to the Old World included: peaches, broccoli, lettuce, onions, oranges, and wheat.

Before its arrival in Spain, no one in Europe knew that corn existed. Once in Spain, corn quickly spread throughout Europe and the Middle East. The Portuguese took corn to Africa where it replaced millet, an African grain. By the 1550s, corn spread to China and other Asian countries. Today, corn is grown almost everywhere.

Directions

1. Share the background information. It may be helpful to have students locate each country or region on the map.
2. Ask students to select a country mentioned in the Background Information.
3. Have students research their country in terms of climate, foods, and agriculture.
4. Ask students to write two journal entries from the perspective of an explorer or adventurer, introducing corn to his/her country. Use the "Explorer's Journal" worksheet to provide students questions to answer in their writings.
5. Review students' writings and evaluate according to the rubric.
6. Use the questions provided for a follow-up discussion.

Illinois Learning Standards:
3.A.1; 3.B.1b; 3.C.1a; 5.B.1a; 5.C.1a; 16.D.1 (US); 18.C.1

Illinois Assessment Framework:
3.3.01; 3.3.14; 3.3.17; 3.3.18; 3.3.19; 3.3.26; 3.3.27

Discussion Questions:

- Why do you think many cultures or groups use corn?
- Draw some conclusions about what type of climate corn needs to grow.
- Is corn as valued today as in the past? Why or why not?
- Ask students to predict what foods were shared between the New World and the Old World during the Great Exchange. What impact did the Great Exchange have on both regions?

EXPLORER'S JOURNAL

Entry 1:

- Provide a description of the corn.
- Who gave it to you? What did they tell you about it?
- How did you share the new crop with people in your country?
- What was their first response?
- What other crops grow in your country?
- Make a prediction: How will corn be used in your country?

Entry 2:

- Who decided to plant corn in your country? Why?
- What is your country's climate?
- How well does corn grow in your climate? *(Hint: To answer this question, think about the climate in Illinois where corn grows. How does your countries climate compare to Illinois' climate?)*
- Has this new crop changed agriculture in your country? How?
- How is corn being used?
- Was this new crop accepted in your country? Why or why not?

Scoring Rubric

Use for each journal entry.

Content

10 Points: Answered four or more questions
7 Points: Answered three questions.
5 Points: Answered 2 questions
3 Points: Answered 1 question
0 Points: Answered NO questions

Applied Information

5 Points: Student researched his/her country and applied this information in his/her writing.
3 Points: Student researched his/her country but did not adequately apply this information.
0 Points: There is no evidence that the student researched his/her country.

Corn is Maize

Objective:
Students will learn about corn's role in key events throughout United States' history.

Corn's Importance in American History
The Native Americans called corn, maize, meaning "our life" or "our mother." It was their main food source. Corn was so important that some tribes prayed to the Corn Gods who they believed sent it to them. These tribes had festivals at planting and harvesting time. They chanted and made music, and each tribe danced its own Corn Dance.

Many tribes taught European settlers how to grow, grind and cook maize. In 1621, Chief Massosoit taught the Pilgrims and other settlers how to grow corn. During the first Thanksgiving, the Pilgrims and Native Americans gave thanks for the corn harvest. The Pilgrims relied on corn to help them survive the first winter in New England. The Pilgrims learned other uses for corn such as stuffing mattresses with corn husks and feeding it to livestock.

Directions for Activty 1: Corn is Maize
1. Gain students' interest by asking: What foods did the Native Americans eat?
2. Read Corn is Maize: The Gift of the Indians to students.
3. Then ask students some or all of these discussion questions:

- Name the steps of corn growth.
- What are some of the different ways Native Americans ate corn?
- Other than food, what were some of the other uses for corn?
- How important was learning about corn to the Pilgrims' survival?
- Name some foods you eat that have corn in them.
- How did the Native Americans grow and process corn? Is this different from what we do today? If so, how?

4. Create a Venn Diagram comparing how Native Americans and early settlers used corn and how we use corn today.

Directions for Activity 2: Corn Timeline
1. Cut the "Corn Timeline" events into strips.
2. Pass out the strips to students and ask them to arrange themselves in chronological order.
3. Give students clues or hints to help them out. After students are in the correct order, review the timeline.
4. Possible discussion questions could include:

- Why was corn so important in early American history?
- How has corn's role in our lives advanced over time?
- What other events could we add to this timeline?

Illinois Learning Standards:
Activity 1: 2.B.1a; 16.C.1a (W) 18.C.1

Activity 2: 16.C.2b (US); 16.C.2c (US); 16.E.2b (W)

Illinois Assessment Framework:
Activity 1: 2.3.10

Related Resources:
Aliki, Corn is Maize: The Gift of the Indians. Harper Collins Publishers, New York: 1976.

Find more on the History of Corn at: www.campsilos.org

For more agricultural history information, access "Growing a Nation" at www.agclassroom.org/gan/

Or borrow "Illinois Agriculture: Innovation and Invention" from your county's Ag Literacy Coordinator.

Please see the AMAIZING Activity Page on our website for hands-on Native American activities to enhance this lesson.

CORN TIMELINE

Cut these timeline events into strips. If there are not enough for each student, pair students up and have them work as a team.

Teosinte is domesticated in Sierra Madre, Mexico.

Corn cultivation reached both Mexican coasts.

Native American tribes planted corn for a variety of uses.

Columbus encountered Native Americans cultivating corn as crop.

Coronado saw Pueblo Indians raising corn near the Rio Grande River.

Powhatan's people saved Captain Smith's starving people with gifts of corn.

Jacques Marquette reported that the Illinois Tribe raised and relied on Indian corn to survive.

Cornhusk-stuffed mattresses are used in colonial homes.

Settlers ate corn in all 3 daily meals.

The Underground Railroad transported slaves to freedom; they found corn along the way to survive.

Lewis and Clark set up a corn mill in the Dakota Territory.

The Erie Canal opened for shipping corn east.

John Deere developed the first successful steel plow.

Pioneer wagon trains headed west on the Oregon Trail carrying "Journey cakes."

During the Civil War, corn meal was an important staple for soldiers. It was used to make Johnnie cakes and corn bread.

Henry Ford built the first car to run on ethanol.

Corn Timeline

Kellogg's corn flakes are first produced in Battle Creek, Michigan. Corn flakes are made with corn grit or the "heart of the corn."

The Lever Act is passed, which gave the president power to regulate the nation's food supply. Advertising encouraged Americans to eat more corn, poultry and vegetables as part of the war effort.

Fuel demands increased ethanol use to 60 million gallons per year.

The 18th Amendment is ratified. Ethanol can only be sold when rendered with 5 percent petroleum.

Congress passed tax incentives to promote ethanol production and increase business for farmers.

Geneticists discovered that growing corn hybrids produced healthier crops and higher yields.

In Peoria, Illinois, Dr. Howard Florey and Norman Heatley discovered that a corn by-product from the milling process along with other ingredients produce faster growth and larger amounts of penicillin.

In Peoria, Illinois, Andrew Moyer increased the yields for penicillin ten fold, which provided enough penicillin to treat Allied soldiers.

During World War II, 20 million Americans planted gardens and produced 9-10 million tons of fruits and vegetables, such as sweet corn.

The first Kwanzaa celebration occurred, featuring fruits of the harvest such as corn.

Widespread interest in ethanol developed as several Arab oil-producing nations refused to sell oil to countries that supported Israel.

The number of ethanol plants reached the highest point at 163, producing almost 600 million gallons of ethanol in one year.

Corn varieties developed by genetic engineering were first introduced.

Ethanol production surpassed three billion gallons per year.

In response to growing ethanol demands, farmers planted 92.9 million acres of corn.

Corn Timeline: Teacher Answer Key

4000-3000 B.C.: Teosinte is domesticated in Sierra Madre, Mexico.

1400 B.C.: Corn cultivation reached both Mexican coasts.

1400: Native American tribes planted corn for a variety of uses.

1492: Columbus encountered Native Americans cultivating corn as crop.

1540: Coronado observed Pueblo Indians raising corn near the Rio Grande River.

1608: Powhatan's people saved Captain Smith's starving people with gifts of corn.

1621: Jacques Marquette reported that the Illinois Tribe raised and relied on Indian corn to survive.

1669: Cornhusk-stuffed mattresses are used in colonial homes.

1750: Settlers ate corn in all 3 daily meals.

1801: The Underground Railroad transported slaves to freedom; they found corn along the way to survive.

1804: Lewis and Clark set up a corn mill in the Dakota Territory.

1825: The Erie Canal opened for shipping corn east.

1837: John Deere developed the first successful steel plow.

1840: Pioneer wagon trains headed west on the Oregon Trail carrying "Journey cakes."

1862: During the Civil War, corn meal was an important staple for soldiers. It was used to make Johnnie cakes and corn bread.

1896: Henry Ford built the first car to run on ethanol.

Corn Timeline: Teacher Answer Key

1906: Kellogg's corn flakes are first produced in Battle Creek, Michigan. Corn flakes are made with corn grit or the "heart of the corn."

1917: The Lever Act is passed, which gave the president power to regulate the nation's food supply. Advertising encouraged Americans to eat more corn, poultry and vegetables as part of the war effort.

1918: Fuel demands increased ethanol use to 60 million gallons per year.

1919: The 18th Amendment is ratified. Ethanol can only be sold when rendered with 5 percent petroleum.

1933: Congress passed tax incentives to promote ethanol production and increase business for farmers.

1940s: Geneticists discovered that growing corn hybrids produced healthier crops and higher yields.

1941: In Peoria, Illinois, Dr. Howard Florey and Norman Heatley discovered that a corn by-product from the milling process along with other ingredients produce faster growth and larger amounts of penicillin.

1943: In Peoria, Illinois, Andrew Moyer increased the yields of penicillin ten fold, which provided enough penicillin to treat Allied soldiers.

1943: During World War II, 20 million Americans planted gardens and produced 9-10 million tons of fruits and vegetables, such as sweet corn.

1966: The first Kwanzaa celebration occurred, featuring fruits of the harvest such as corn.

1970s: Widespread interest in ethanol developed as several Arab oil-producing nations refused to sell oil to countries that supported Israel.

1983: The number of ethanol plants reached the highest point at 163, producing almost 600 million gallons of ethanol in one year.

1996: Corn varieties developed by genetic engineering were first introduced.

2004: Ethanol production surpassed three billion gallons per year.

2007: In response to growing ethanol demands, farmers planted 92.9 million acres of corn.

Vocabulary:

kernel: a corn seed

combine:a harvesting machine that heads, threshes, and cleans grain while moving over a field

export: a product transported from one country to another for purposes of trade

starch: a carbohydrate found in plants; used in many food products

Related Resources:

U of I Extension Office Interactive Corn Lesson www.urbanext.uiuc.edu/corn

National Corn Growers Association Corn Curriculum www.ncga.com/education/main/index.html

Illinois Corn Growers/ Marketing Board Education Resources www.ilcorn.org

Borrow John Deere combine toys from your Ag Literacy coordinator.

Please see "A Corny Skit" on our website for an Interest Approach Activity.

FIELD CORN

What is Field Corn?

Corn is a member of the grass family of plants. Unlike other grasses, corn is annual plant. It cannot survive the winter and must be replanted each year. It is a self-pollinating plant. As the plant grows, it begins to produce ears of corn, covered with a green husk. Feathery tassels form at the top of the plant and produce pollen, a yellowish powder. The ears form silks or long strands that catch pollen as the wind blows. This process is called pollination and allows the ears to produce kernels. Once the ears have kernels, the maturity process continues until the entire plant is dry and brown.

Field corn has a hard outer shell and is full of starch. This type of corn is also known as dent corn, because the kernel forms a dent on the cap or crown at maturity. The corn plant will grow 7-10 feet tall. Most plants need to have 1 or 2 ears of corn to produce a better crop yield. An ear of corn has rows of kernels. There may be as few as 8 or as many as 36 rows on an ear of corn. The number of rows is always even. There are about 600 kernels in an average ear of corn. Corn is measured in bushels and it takes about 72,800 kernels or 121 ears of corn to make a bushel.

Field corn is harvested between late September and November using a large combine. The combine removes the ear of corn and separates the kernels from the corn cob. Parts of the plant are left in the field to protect the soil for the next year.

After corn is harvested, it is taken to a grain elevator to be stored or sold. It is then exported to another country or sent to processing plant. Some of the corn is used for animal feed and some of the corn is used to make food and other products. At the processing plant, the corn is soaked and milled to separate the germ, oil, starch, gluten, and hulls. These are called by-products and are used to make things such as cereal, pop, crayons, batteries, and ethanol. In fact, field corn is used in more than 4,200 products.

The United States grows more corn than any other country and 75% of the corn in the U.S. comes from the Midwest. Illinois, Iowa, and Nebraska grow the most corn. Minnesota, Indiana, Wisconsin, Ohio, Michigan, Missouri, and South Dakota also grow corn. These corn-producing states are known as the Corn Belt. Illinois is the second largest producer of field corn. Illinois farmers plant over 11 million acres each year, which yields over 1.5 billion bushels of field corn.

The Illinois Corn Numbers

Activity 1: Field Corn Production in the United States: Where Does Illinois Rank?

Objective: To explore the significant corn producing region within United States, known as the Corn Belt. Students will become familiar with corn production rates for each state.

Background Information Illinois, Indiana, Iowa, Nebraska, and Minnesota produce over 64% of the corn grown in the United States. Other major corn producing states include Wisconsin, South Dakota, Michigan, Missouri, Kansas, Ohio, and Kentucky. Combined all of these states are known as the Corn Belt.

Directions:
1. Provide students with the "Field Corn Production in the United States: Where Does Illinois Rank?" worksheet.
2. Ask students to complete the worksheet and then review the answers as a class.

Discussion Questions:
1. Were you surprised to learn that Illinois is a leading producer of field corn? Why or why not?
2. What climate is best for growing field corn?
3. Is field corn produced in your community? How can you tell?

Activity 2: Illinois Corn is Exported All Over the World

Objective: To examine Illinois' role as a leading exporter of field corn. Students will develop corn transportation routes out of Illinois to different locations.

Background: Thirty-four percent of Illinois field corn is exported to other locations, making Illinois the largest exporter of corn.

Directions:
1. Share the field corn and transportation background information.
2. Provide students with the "Illinois Corn is Exported All Over the World" worksheets as well as World and United States maps. Be sure these maps include a scale for student use.
3. Ask students to complete the worksheet. Once complete, review the answers as a class.

Discussion Questions:
1. What is an export?
2. Why do these countries need field corn?
3. Make a prediction: What products are imported to the United States?

Illinois Learning Standards:
Activity 1: 6.C.2a; 10.A.2c; 17.A.2b

Activity 2: 7.C.2a; 15.D.2a; 17.C.2b; 17.D.2b

Illinois Assessment Framework:
Activity 1: 6.4.10; 10.4.01

Activity 2: 7.4.02

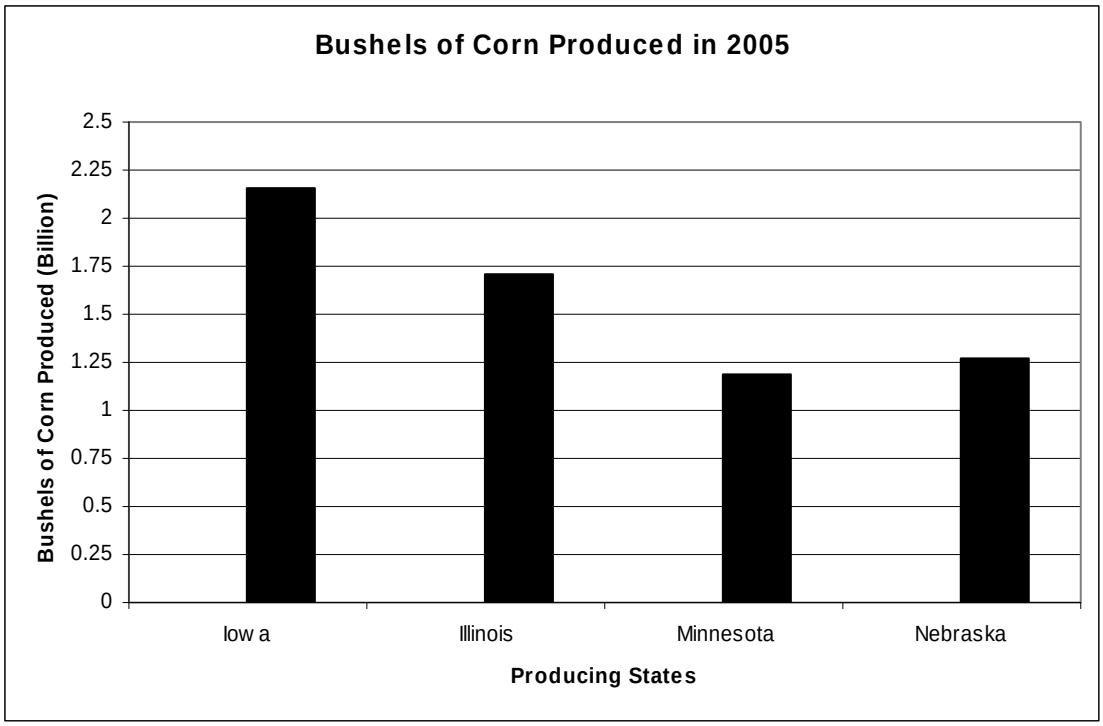
Related Resources:
Corn Ag Mag
Water Ag Mag

Bial, Raymond. Corn Belt Harvest. Boston: Houghton Mifflin, 1991.

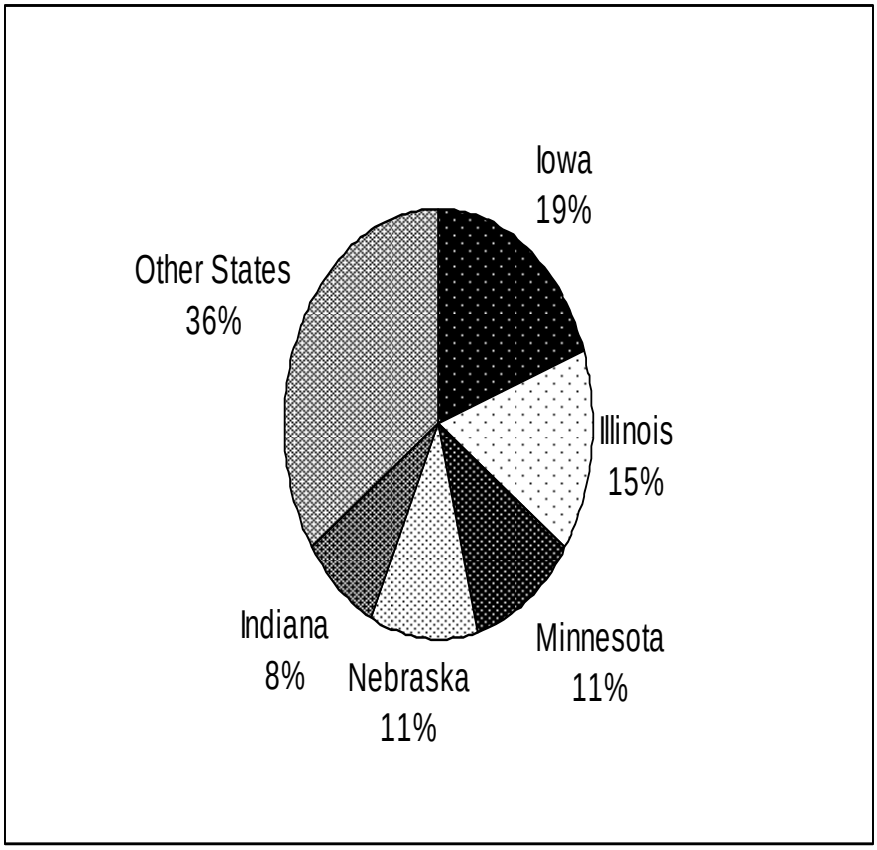
Additional Activities:
Have students locate the Corn Belt states on the map.

Ask students to research information about the climate and types of soils found in these states that are conducive for growing corn.

Field Corn Production in The United States: Where Does Illinois Rank?



Other States	Bushels *Hundred Million*
Wisconsin	8.88
South Dakota	4.29
Michigan	2.89
Missouri	3.30
Kansas	4.66
Ohio	4.65
Indiana	8.56



Field Corn Production in The United States: Where Does Illinois Rank?

1. How much field corn did Illinois produce in 2005?

2. How much field corn did Illinois and Iowa produce in 2005?

3. How much more field corn did Illinois produce than Nebraska?

4. Think about the Illinois climate and seasons. What conclusions can you draw about the conditions field corn needs to grow?

5. What percentage of US field corn is produced in Iowa, Illinois, Minnesota, Nebraska, and Indiana?

6. Did Illinois or Missouri produce more field corn in 2005? By how much?

7. Do you think Illinois field corn production will increase or decrease in the coming years? Why or why not?

Field Corn Production in The United States: Where Does Illinois Rank?
Answer Key

1. How much field corn did Illinois produce in 2005?
   1.71 billion bushels—Answers will slightly vary

2. How much field corn did Illinois and Iowa produce in 2005?
   3.87 billion bushels—Answers will slightly vary

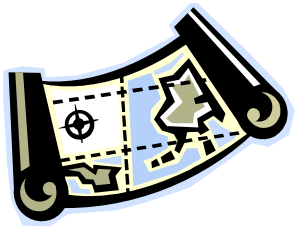
3. How much more field corn did Illinois produce than Nebraska?
   0.44 billion bushels—Answers will slightly vary

4. Think about the Illinois climate and seasons. What conclusions can you draw about the conditions field corn needs to grow?
   Hot summers for plants to grow
   Cold winters to replenish soil for spring planting
   Rainfall averaging 34-40 inches per year

5. What percentage of US field corn is produced in Iowa, Illinois, Minnesota, Nebraska, and Indiana?
   64 percent

6. Did Illinois or Missouri produce more field corn in 2005? By how much?
   Illinois; 1.41 billion

7. Do you think Illinois field corn production will in crease or de-crease in the coming years? Why or why not?
   Answers will vary



Illinois Corn Is Exported All Over the WORLD!

Thirty-four percent of the corn grown in Illinois is exported to other countries. But, how does it get there?

Using World and United States maps, plan a transportation route for each location starting from Illinois. Illinois corn is loaded onto barges and shipped down the Mississippi river to New Orleans. From New Orleans, the corn is sent around the world! Use the Map's scale to determine the total number of miles the corn will be transported. The corn and water Ag Mags will be helpful to answer some of the questions.

Japan

How much corn does the United States export to Japan?

Transportation Route:

Total Miles Transported:

What might corn be used for in Japan?

Algeria

How much corn does the United States export to Algeria?

Transportation Route:

Total Miles Transported:

Why do you think corn is not easily grown in Algeria?

Don't forget to use the CORN and WATER Ag Mags to answer some of these questions!

Canada

How much corn does the United States export to Canada?

Transportation Route:

Total Miles Transported:

What percentage of U.S. corn exports does Canada receive?

Why do you think Canada imports corn from the United States?

Mexico

How much corn does the United States export to Mexico?

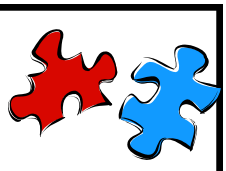
Transportation Route:

Total Miles Transported:

What do you think field corn is used for in Mexico? (*Hint think about cattle).*

Mexico grows its own white corn. What is it used for?

Putting It all Together



Why do countries exchange different goods?

What does geography impact this exchange between countries?

Corn in My Food

Objective:

To examine the different products that contain field corn and its by-products. Students will understand the impact field corn has on their daily lives. Students will also read nutrition labels for food products made from corn.

Directions

1. Ask students and parents to collect food boxes or containers.
2. Collect other products made from corn such as chewing gum and film. Be sure to include other non-food products that are not made from corn.
3. Prepare two brown paper bags by labeling them: Made With Corn; Not Made With Corn.
4. In your classroom or gym, mark off two lines using masking tape at opposite ends of the room.
5. Have students line up behind one line and place the bags on the other line.
6. Pile all of the products together for students to see. Tell students that during this game they must decide whether or not these products are made from corn.
7. When it is a student's turn, hand him or her a product.
8. Students must run down to the other end and place the product in the appropriate bag.
9. Once all the items are sorted, go through the bags as a class. Have a discussion about which items are made from corn. It may be helpful for students to read the product labels and the Corn Mag to make a final decisions.
10. For a post-assessment, ask students to write a paragraph explaining "What My Life Would Be Like Without Corn."

Here is a list of possible foods made from different corn by-products. Use this list to gather items for The Corn Challenge .

Corn Starch

- Chewing gum
- Canned Vegetables
- Salad dressing
- Mustard
- Pudding
- Soups

High Fructose Corn Syrup

- Canned juices
- Canned fruits
- Jams
- Syrups

Corn Syrup

- Cereal
- Fruit Drinks
- Chocolate
- Ice Cream
- Fruit Drinks

Corn Oil

- Soups
- Margarine
- Mayonnaise
- Potato chips
- Sauces

Illinois Learning Standards:
3.A.1; 3.B.1b; 3.C.1a; 15.C.1a; 19.A.1; 21.A.1a;

Illinois Assessment Framework:
3.5.01; 3.5.14; 3.5.17; 3.5.18; 3.5.19; 3.5.26; 3.5.28

Related Resources:
Searching for the Real Illinois Brochure, available from your county's Ag Literacy Coordinator

Check out www.ontariocorn/potgold.html for an overview of corn products.

More information on corn products: www.ilcorn.org

Anton, William. Corn: From Farm to Table. Newbridge Educational Publishing, 1999.

Folwer, Alan. Corn—On and Off the Cob. Children's Press, 1994.

Illinois Learning Standards:
1.C.2b; 1.C.2f; 2.A.2c; 2.B.2c; 18.A.2

Illinois Assessment Framework:
1.4.17; 1.4.22; 2.4.11; 2.4.13

Related Resources:

Find other corn themed legends at http://www.firstpeople.us/

Carl Sandburg's "Illinois Farmer" is available at: www.bartleby.com/134/8.html

Additional Activities:
Ask students to write their own legend or tale to explain a scientific phenomena. Here are some possible suggestions:
- Why pigs do not sweat
- Why chickens lay eggs
- The legend of soybeans

Corn Legends

Objective:
Students will discover the use of oral stories in Native American tribes.

Background:
Many Native American tribes have stories or legends describing the importance and respect for corn. These stories have been passed through generations and continue to be told today in oral tradition fashion.

Directions:
1. Ask students to read "The Strange Origin of Corn."
2. Discuss the following questions:
- What is the metaphor used in this story?
- What is the simile used in this story?
- What part of the corn plant does the woman's hair represent?
- What information does this story provide about corn's growth?
- What does this legend suggest about corn's role in Native American cultures?
3. Review what a simile and metaphor are.
4. Provide students with the Corn Ag Mag, pictures from our calendar, website links, and hands-on examples of dent corn to examine.
5. Have students write and illustrate their own simile or metaphor to describe corn.
6. Without revealing what type of comparison they created, ask students to share their sentence and illustration with the class.
7. Have the other students determine whether the comparison is a simile or a metaphor.

Discussion Questions:
1. What is a legend?
2. What does this legend reveal about the importance of corn to many Native American tribes?
3. What other legends are you familiar with?

Extended Activity:
Ask students to read "Illinois Farmer" by Carl Sandburg. Carl Sandburg was born in Galesburg, Illinois. Many of his poems capture his experiences in the Midwest. Using the legend and poem, have students compare and contrast the following:
- The importance of agriculture
- Man's dedication to working the land
- Imagery used to describe corn

The Strange Origin of Corn
From the Abnaki Tribe

A long time ago, when the Indians were first made, one man lived alone, far from any others. He did not know fire, and so he lived on roots, bark, and nuts. This man became very lonely for companionship. He grew tired of digging roots, lost his appetite, and for several days lay dreaming in the sunshine. When he awoke, he saw someone standing near and, at first, was very frightened.

But when he heard the stranger's voice, his heart was glad, and he looked up. He saw a beautiful woman with long light hair! "Come to me," he whispered. But she did not, and when he tried to approach her, she moved farther away. He sang to her about his loneliness, and begged her not to leave him.

At last she replied, "If you will do exactly what I tell you to do, I will also be with you."

He promised that he would try his very best. So she led him to a place where there was some very dry grass. "Now get two dry sticks," she told him, "and rub them together fast while you hold them in the grass."

Soon a spark flew out. The grass caught fire, and as swiftly as an arrow takes flight, the ground was burned over. Then the beautiful woman spoke again: "When the sun sets, take me by the hair and drag me over the burned ground."

"Oh, I don't want to do that!" the man exclaimed.

"You must do what I tell you to do," she said. "Wherever you drag me, something like grass will spring up, and you will see something like hair coming from between the leaves. Soon seeds will be ready for your use."

The man followed the beautiful woman's orders. And when the Indians see silk on the cornstalk, they know that the beautiful woman has not forgotten them.

Story source: http://www.indians.org/welker/origcorn.htm

Vocabulary:

steam: the invisible vapor into which water is converted when heated to the boiling point

boiling point: the temperature at which a liquid boils. Water boils at 100 degrees Celsius.

bill: a draft of a law presented to legislature

law: a rule of conduct established by the legislation of a state or nation

Related Resources:

Popcorn is featured in the Illinois Charm available from: www.agintheclassrom.org

State Symbols coloring book available from: www.cyberdriveillinois.com

Myers, John, ed. What Makes Popcorn Pop?: And Other Questions About the World Around Us. Honesdale, PA: Boyds Mills, 1991.

Learn how a bill comes a law at: http://clerkkids.house.gov

POPCORN

What is Popcorn?

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 333 farms that grow popcorn on 47,000 acres, which makes Illinois the fourth 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. Americans eat 16 billion quarts of popcorn each year, which equals to about 59 quarts per person.

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.

BACKGROUND INFORMATION:

The Corn Belt states produce the majority of the popcorn grown in the United States. Illinois ranks fourth in popcorn production.

ACTIVITY 1:

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/
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:

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.

Illinois Learning Standards:

Activity 1: 3.A.2; 3.C.2a; 6.A.2; 10.A.2a; 10.A.2c; 17.A.2a; 17.A.2b

Activity 2: 5. A.2a; 5.B.2b; 17.A.2a; 17.A.2b

Illinois Assessment Framework:

Activity 1: 3.5.01; 3.5.18; 3.5.19; 10.4.01

Related Resources:

Check out the section on Popcorn in the Corn Ag Mag.

Hands-On Popcorn Lessons across a variety of curriculum areas: www.popcorn.org

DePaola, Tommie. The Popcorn Book. Holiday House, 1989.

Landau, Elaine. Popcorn! Watertown, MA: Charlesbridge, 2003.

Poppin' Up In Illinois

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 would 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	350,000,000	35 kernels	
Indiana	220,000,000		
Kansas	19,000,000		
Iowa	46,000,000		
Ohio	128,000,000		
Illinois	98,000,000		
Missouri	24,000,000		
Kentucky	25,000,000		

Source: 2002 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 (in bushels)	Number of Popcorn Kernels	Rank
Nebraska	350,000,000	35 kernels	1
Indiana	220,000,000	22 kernels	2
Kansas	19,000,000	(1.9) 2 kernels	8
Iowa	46,000,000	(4.6) 5 kernels	5
Ohio	128,000,000	(12.8) 13 kernels	3
Illinois	98,000,000	(9.8) 10 kernels	4
Missouri	24,000,000	(2.4) 2 kernels	7
Kentucky	25,000,000	(2.5) 3 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.

Illinois Learning Standards:
6.A.2; 6.C.2a; 10.A.2a; 12.A.2b

Illinois Assessment Framework:
6.5.04; 6.5.12; 6.5.19; 10.5.01; 10.5.02; 12.4.06

Related Resources:
Hybrid popcorn available for purchase from:
www.amishcountry.popcorn.com

Additional Activities:

- Continue the fraction and percentage learning. Have students taste a variety of popcorn flavors and vote for their favorite. After students count the votes, have them determine the fraction and percentage of students who preferred each variety. Then, assign students a graph type (pie, graph, and line) and ask students to represent the class results in using this type of graph.

Popcorn Kernel Math

Objective:

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

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.

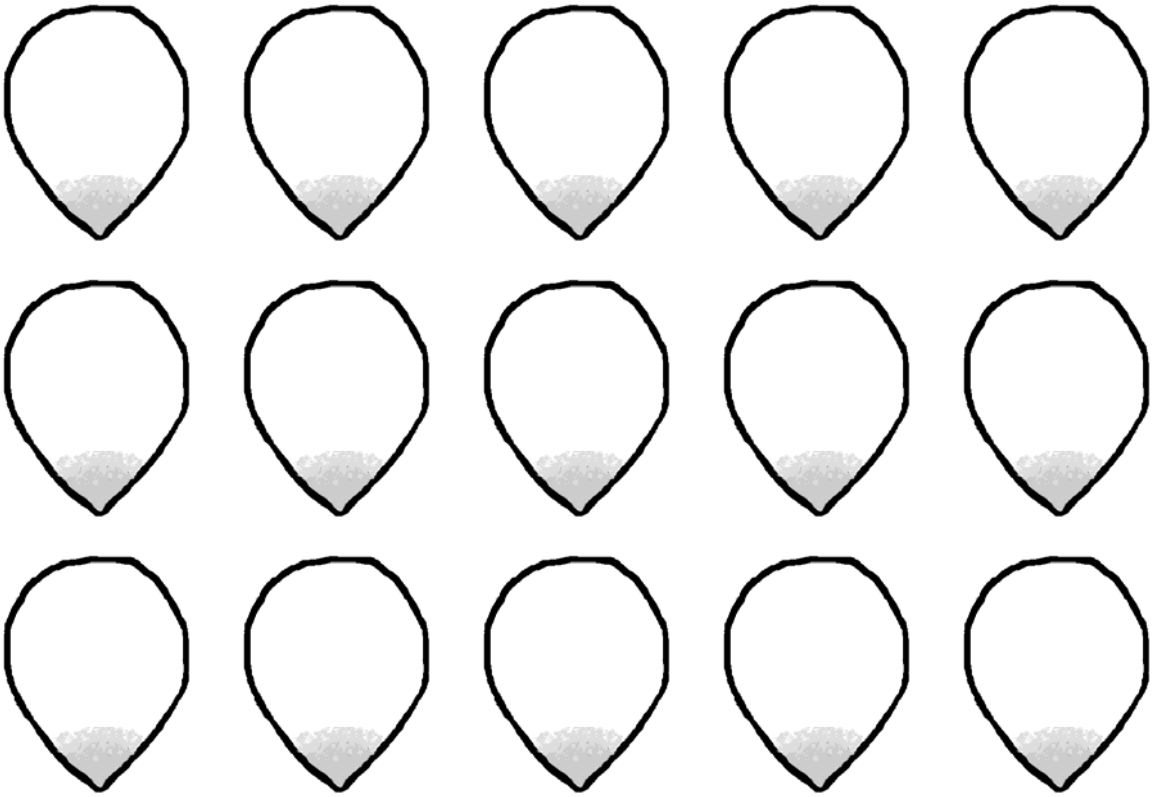
Directions:

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.

Vocabulary:

sugar: a sweet crystallizable material consisting of sucrose

acre: a unit of measurement in the United States and England equal to 43,560 square feet. Farm land is measured in acres

harvest: the process of gathering a mature crop

gene mutation: a mutation due to the reorganization of genes, which often results in physical changes

Related Resources:

See the section on Sweet Corn in the Corn Ag Mag.

Additional Activity:
Share poems from Sweet Corn by James Stevenson. One poem features Stevenson's experience of eating sweet corn during the summer. Have students write their own poem about an everyday experience.

Stevenson, James. Sweet Corn. New York: William Morrow & Company, 1995.

SWEET CORN

What is Sweet Corn?

Sweet corn also known as *Zea may saccharata* is a sugary-seeded kind of maize. It is a genetic mutation of field corn. This mutation in sweet corn causes the kernel to store more sugars than field corn. At its peak, sweet corn contains 5-14% sugar. Once picked, sweet corn starts losing its sweetness, because its sugars are converted into starch.

Sweet corn must be harvested at the proper stage of maturity. The critical time is the milk stage, when the juice from the kernel appears milky. Sweet corn remains in the milk stage for a short period of time. Other characteristics of sweet corn during this stage include: full kernels at the tip of the ear, brown, dry silks, and overall firmness.

Most Native American tribes did not grow sweet corn, because they disliked the sugary taste or had trouble growing it. Sweet corn is harder to produce and preserve the seeds than other forms of corn. Sweet corn was not an important food item for neither Native Americans nor early settlers.

The first published mention of sweet corn was not until 1801. Early varieties were first planted in the eastern United States. During the Civil War, more varieties appeared and from this point on sweet corn's popularity in the United States has steadily increased. Today, there is a wide variety of sweet corn. Sweet corn types vary in color and sugar levels. Not all sweet corn is equally sweet!

Over 700,000 acres of sweet corn are grown in the United States each year for both fresh market and processing. This makes the U.S. both the leading producer and leading exporter of sweet corn. Illinois farmers planted over 19,400 acres of sweet corn in 2002. The fertile soils, moderate rainfall and temperate weather of Illinois make it an ideal place for growing sweet corn.

SOME *SWEET* TRAITS

OBJECTIVE:
Students will demonstrate chromosome pairings and complete Punnett Squares to determine possible offspring outcomes.

BACKGROUND INFORMATION:
Sweet corn varies in plant height, ear length, and kernel type. Sweet corn also varies in sweetness levels. Super sweet varieties are the result of breeding sweet corn hybrids for a high sugar concentration. The super sweet varieties start out with a high sugar content at harvest and tend to hold their sweetness through shipping and storage. Taste preference and longer shelf life make this hybrid very popular for consumers and retailers. Because science has been able to keep up with consumer preferences, fresh market sweet corn sales have increased in recent years.

The popular super sweet varieties are hybrids. A hybrid is the offspring of two plants of different varieties produced through human manipulation to obtain specific genetic characteristics. To create a sweet corn hybrid, pollen from one plant is placed on another plant. The crossing of these two plants yields an offspring and potentially another variety of sweet corn.

The nucleus of a plant cell contains Deoxyribonucleic Acid. DNA in the nucleus is grouped into 23 sets of chromosomes. In each chromosome, the DNA is grouped into genes. DNA is responsible for the expression of a variation of a trait. The DNA that makes up genes may vary. One gene may express tall plant height while the other may express short plant height.

A Punnett Square is a chart used to show/predict all possible gene combinations in a cross of parents, whose genes are known. Punnett Squares show the genotype (genetic makeup) and the phenotype (physical makeup).

DIRECTIONS:
1. Before starting this activity, students need to be familiar with chromosomes, DNA, and Punnett Squares.
2. Create 8 containers of beads of eight different colors.
3. On a tray, create the following bead pairs: brown/green, yellow/blue, white/orange, and black/clear. These represent four different traits of the sweet corn plant.
4. Provide students with the trays, pipe cleaners, and the worksheet.
5. Review students answers for Punnett Squares. These answers will vary based on the traits they selected.

Illinois Learning Standards:
12.A.3a; 12.A.3b; 12.A.3c

Illinois Assessment Framework:
12.7.02; 12.7.05; 12.7.08 12.7.11

Related Resources:

Biotechnology Ag Mag

DNA Activity available at:
www.agintheclassroom.org

DNA Basics available from the University of Utah:
http://learn.genetics.utah.edu/

Discussion Questions:
- What is a genotype?
- What is a phenotype?
- What is a dominate gene?
- What is a recessive gene?
- How have hybrids impacted agriculture?
- How have hybrids impacted consumer choices?

SOME *SWEET* TRAITS

Trait or	Variation	Symbol	Bead Col-
Kernel color	yellow	Y	brown
	white	y	green
Sweetness	super sweet	S	yellow
	mild	s	blue
Seed texture	smooth	T	white
	wrinkled	t	orange
Height	tall	H	black
	short	h	clear

1. Create a make believe sweet corn plant with the four traits listed above:
- Pick two beads from each tray representing a trait. They can be any color for that trait.
- Once the beads have been selected, string them onto the pipe cleaner, so that one bead from each trait is represented. Make sure that the order of the beads follows the order of traits listed above (kernel color, sweetness, seed texture, height).
- Examine your chromosome pair. List the genotypes and phenotypes for this pair.

2. Create another make believe sweet corn plant with the four traits above.
- Examine your chromosome pair. List the genotypes and phenotypes for this pair.

3. Now, let's cross your sweet corn plants to create a new sweet corn hybrid.
- Draw four Punnett Squares on the back of this worksheet. For each trait, determine the possible genotypes and phenotypes of the offspring for this cross.
- What is the probability that your hybrid will be a super sweet variety?

- What is the probability that your hybrid will be a short plant?

4. On the back of this worksheet, create two Punnett Squares showing the cross of two plants yielding a super sweet variety with 100% probability.

To Market, To Market: Trends in the Sweet Corn Market

Objective:
Students will learn about the three markets for sweet corn as well as the relationship between demand and price.

Background Information:
Sweet corn is produced for three distinct markets: fresh, canning, and frozen. Therefore, sweet corn is a dual-use vegetable, meaning that it can be sold fresh and processed for future use. It is the third leading vegetable used for processing following potatoes and tomatoes.

U.S. sweet corn consumption has changed over the years with Americans eating less canned corn and more fresh and frozen sweet corn. Fresh sweet corn consumption has increased due to sweeter varieties. Frozen sweet corn consumption has increased because of ease in preparation and an increased focus on nutrition.

Directions:
1. Guide a discussion about sweet corn consumption. It may be helpful to use the following questions:
- What is sweet corn? Share background information with students.
- In what ways can it be purchased? (Fresh, frozen, and canned)
- Which way is the most popular at your house? Record students' responses on a chalk board or large piece of paper to determine the most popular way to eat sweet corn.
- Explain to students that when a product is popular, it is in high demand, meaning that many people want to purchase it. Ask students to make a prediction: What impact does a high demand have on cost? Why?

2. Have students complete the "To Market, To Market: Trends in the Sweet Corn Market" worksheet.
3. After reviewing the answers, ask students if their earlier prediction about demand and price was correct. If not, what did they learn about the relationship between demand and price?

Discussion questions:
- What is the most popular way to eat sweet corn in the class? Does this match the national figures?
- If you were a sweet corn farmer, which market would you try to sell your corn to? Why?
- How would the demand for your product change if carrots were the most popular vegetable? How would this impact price?
- How would the demand for your product change after an "Eat Sweet Corn" campaign? How would this impact price?
- What other examples can you think of that demonstrate the price and demand relationship?

Illinois Learning Standards:
10.A.2a; 10.A.2c; 15.B.2a; 15.B.2b; 15.C.2a

Illinois Assessment Framework:
10.5.01

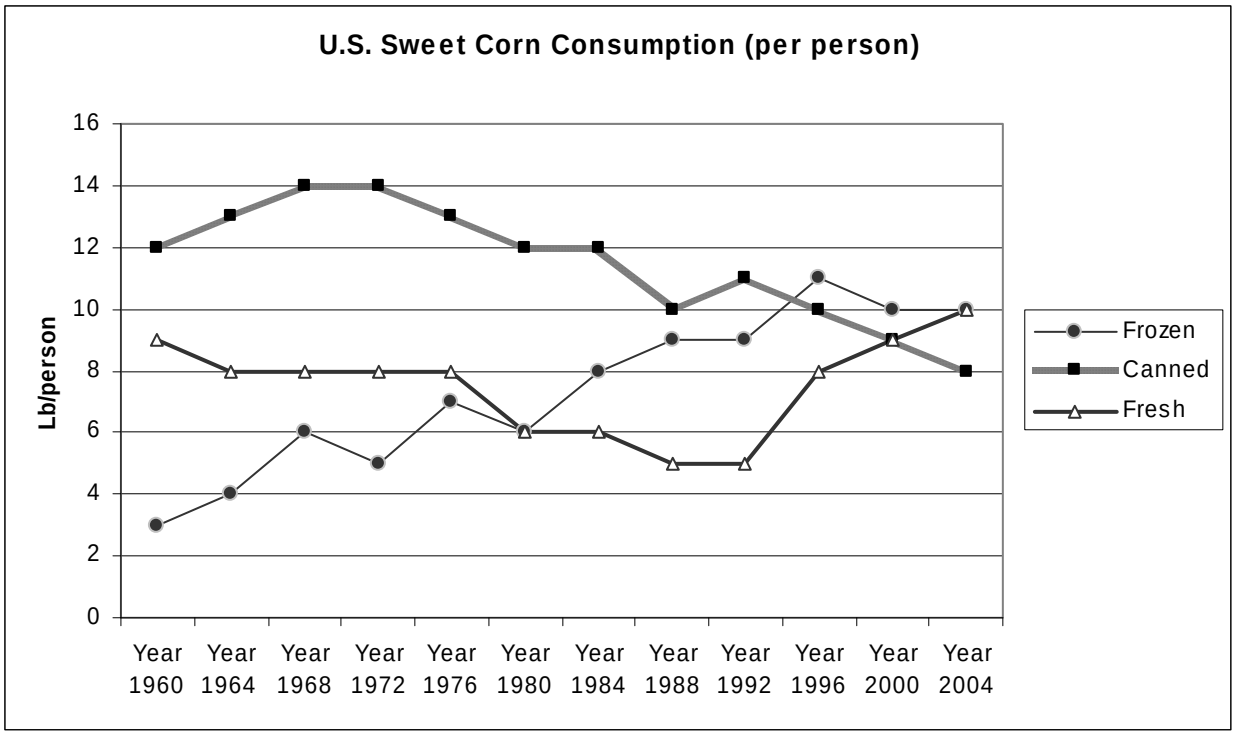
Related Resources:
Information for students about supply and demand available from:
www.socialstudiesforkids.com

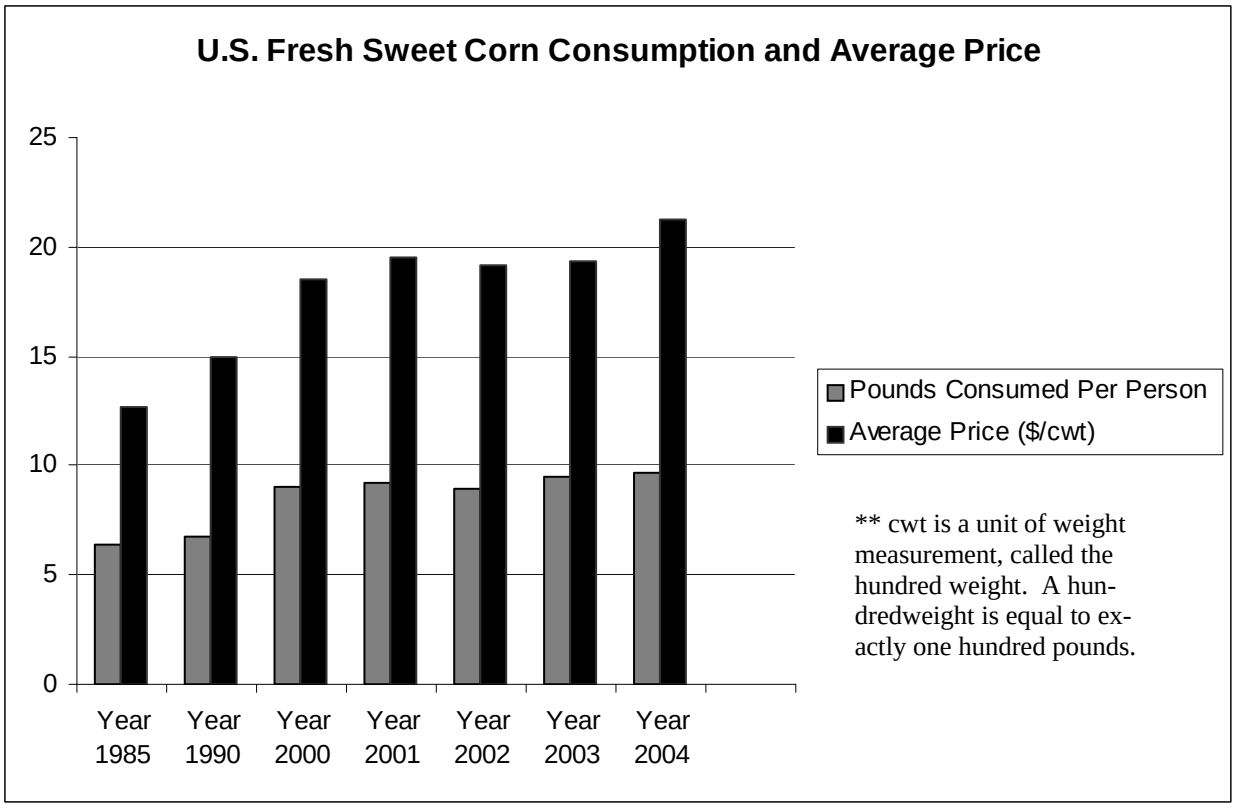
For additional economic-themed lessons check out:
www.moneyinstructor.com

Additional Activities:
Have students create a line graph showing the relationship between demand and cost.

Present scenarios illustrating the relationship between supply and demand. For example:
- What would happen to price if a storm destroyed the sweet corn crop, but the demand remained high?

To Market, To Market: Trends in the Sweet Corn Market





To Market, To Market: Trends in the Sweet Corn Market

Using the information presented in the U.S. Sweet Corn Consumption chart, answer the following questions:

1. By how much did fresh sweet corn consumption increase from 1988 to 2004? Why do you think more people started eating fresh sweet corn?

2. Which sweet corn market has experienced the greatest increase in consumption?

3. Which sweet corn market has experienced the greatest decrease in consumption? Provide possible reasons why this decrease occurred.

4. Describe the general trends in sweet corn consumption for all three markets (frozen, canned, and fresh).

Using the information presented in the U.S. Fresh Sweet Corn Consumption and Average Price graph, answer the following questions:

1. Describe the relationship between consumption and price for fresh sweet corn.

2. Based on your description, what would happen to the price if people ate less fresh sweet corn. Why?

To Market, To Market: Trends in the Sweet Corn Market

Using the information presented in the U.S. Sweet Corn Consumption chart, answer the following questions:

1. By how much did fresh sweet corn consumption increase from 1988 to 2004? Why do you think more people started eating fresh sweet corn?

Increased by 5lb per person. Possible reasons why people started eating more fresh sweet corn include: consumer demand for fresh products and sweeter hybrids (better taste).

2. Which sweet corn market has experienced the greatest increase in consumption?

Frozen sweet corn

3. Which sweet corn market has experienced the greatest decrease in consumption? Provide possible reasons why this decrease occurred.

Canned sweet corn has experienced the greatest decrease. Possible reasons why people started eating less canned sweet corn include: consumer demand for fresh products and taste preference.

4. Describe the general trends in sweet corn consumption for all three markets (frozen, canned, and fresh).

There has been an overall increase in total sweet corn consumption; Canned sweet corn consumption has decreased, while fresh and frozen sweet corn consumption have increased.

Using the information presented in the U.S. Fresh Sweet Corn Consumption and Average Price graph, answer the following questions:

1. Describe the relationship between consumption and price for fresh sweet corn.

As fresh sweet corn consumption increases, its price increases by small increments.

2. Based on your description, what would happen to the price if people ate less fresh sweet corn?

The overall price would drop; less people want the crop.

BROOM CORN

What is Broom Corn?

Broom corn is a type of sorghum. Most sorghums are grown for grain, animal feed, or for making molasses. Broom corn is unlike other sorghums in that it can only be used for making brooms and brushes.

Native to Africa, all sorghums can be grown under the same conditions as corn. But, broom corn is different from corn in two ways. It does not require a large amount of water to grow and it is sensitive to cold temperatures. Broom corn can survive in high temperatures, making it both drought-resistant and heat-enduring .

Broom corn is a tall plant of long, stiff fibers bearing seeds, which is different than other sorghums. The seed fibers can grow up to three feet long on plants six to15 feet tall. These seed fibers become the brush used for making brooms, because they are flexible and come to a fine point, which makes them great for sweeping.

At growing season's end, the broom corn plant turns from yellow to green. For the strongest fibers, farmers harvest broom corn when it is green from top to bottom! Harvesting broom corn requires a lot of hard work and intense labor. First, someone must walk backwards between two rows and break the stalks in a criss-cross pattern to form a "table." This person is called the "tabler." Then, each fiber or brush is cut off and piled onto this "table." The brush is hauled to a machine that removes the seeds. The brush is then spread on drying racks. After two or three weeks, it is compressed into bales.

How are brooms made?

Once at the factory, broom corn is sorted by length, color, fineness, and straightness. A broom is made on a winding machine that slowly turns a wooden handle as the brush is added. To form the broom's base, short, coarse brush is first added to the middle and sides. Going in the opposite direction, the longer brush is added last. This longer brush is called hurl and it is folded down over the broom. The brush is bound tight by a wire under tension. Another machine clamps the broom in a vise and binds it firmly into shape with four or five lines of twine stitching.

Broom Corn Vocabulary:

sorghum: any member of the Old World tropical grass family

bale: a large bundle

drought: a period of dryness that causes damage to crops

compress: to press or squeeze together

native: grown, originated in a particular place

Related Resources:

For more information about broom corn: www.uky.edu/Ag/NewCrops/introsheets/broomcorn.pdf

Order broom corn seeds at: http://rareseeds.com Click on sorghum.

Illinois Learning Standards:
16.E.2a (US); 17.A.2a; 17.A.2b; 17.D.2b;

Materials:
- World Map
- United States Map
- Illinois Map
- Copies of map handouts included in this booklet

Related Resources:
Learn more about Arcola's history at: www.arcolaillinois.org

More about Levi Dickenson and the history of Early American brooms available from: www.broomshop.com/history/

Bishop Hill lesson plans at: http://www.lib.niu.edu/ipo/1999/iht629902cm.html

Arcola, Illinois: The Broom Corn Capital of the world

Objective:
Students will learn the origin of broom corn and map its path from Africa to the United States.

Background Information:
Broom corn originated from Africa and spread to Europe by 1500 AD. While traveling in Europe in the late 1700s, Benjamin Franklin used a small corn broom to clean his hat. Franklin found a few seeds on the broom and brought them back to Philadelphia. The next spring he planted the seeds and they grew into a tall plant of stiff fibers, bearing seeds. From these seeds, people grew more broom corn to use for garden decoration.

In 1797, Levi Dickenson began to sell brooms made out of broom corn, which launched the broom corn industry. For years, east central Illinois was the largest producer of broom corn. In 1865, Colonel Cofer, an Arcola area farmer, planted 20 acres of broom corn on his land. The crop did so well that others started to plant it. Soon, nearly half of the broomcorn grown in the United States came from the Arcola area. Thus, Arcola, Illinois is known as the "Broom Corn Capital of the World."

Today, only a small acreage is grown in the Arcola area, but it provides seeds for planting in other states. Broom corn growing has shifted westward to Oklahoma, Colorado, New Mexico, and Texas. But, domestic production decreased due to limited demand and intense labor requirements for harvesting. Mexico is now the leading producer of broom corn and brooms. Illinois still maintains its connection to broomcorn with broom factories and broomcorn dealers.

Directions:
1. Share the broom corn history with the students.
2. Have students complete the "Broom Corn is Sweeping the World" mapping activities to explore broom corn's origins and how it arrived in Arcola, Illinois. Be sure to provide students with the directions sheet. Or, complete this activity in a large group by having the teacher read the directions aloud.
3. Have students share their responses to the Broom Corn: How and Why questions. Be sure to review the growing conditions for broom corn and the labor required to harvest it.
4. Then as a class, retell how broom corn made its way to Arcola Illinois.

Broom Corn is sweeping the world!

Broom Corn's journey from Africa to the United States

Use the world map to complete this activity.

1. Find Africa and color it purple. This continent is where broom corn came from.
2. Draw a purple dotted line from Africa to Europe. Broom corn was in Europe by 1500 AD.
3. The broom corn plant was first described in Italy in the late 1500s. Find and color Italy red.
4. Color Europe green. In the late 1700s, Benjamin Franklin used a small broom to clean his hat and found small seeds.
5. Draw a green dotted line from Europe to the United States. Benjamin Franklin brought the seeds back to Philadelphia and planted them in the spring.
6. Color the United States yellow. Benjamin Franklin is credited with introducing broom corn to the United States.

Broom Corn sweeps through the United States

Use the United States map to complete this activity.

1. Find Pennsylvania on the map. Label it with the correct state abbreviation and color it blue. Benjamin Franklin first planted broom corn seeds in Philadelphia.
2. Find Massachusetts on the map. Label it with the correct state abbreviation and color it orange. Here, Levi Dickenson discovered that the stiff fibers of broom corn would be best for making brooms.
3. Color other Northeastern states yellow. Broom corn spread throughout the northeast by 1830.
4. Find Illinois on the map. Label it with the correct state abbreviation and color it red. By the Civil War (1861-1865) Illinois became the center for broom corn production for the United States.
5. Find Oklahoma, Colorado, New Mexico, and Texas on the map. In the 1970s, these states harvested over 100,000 acres of broom corn. Label each with the correct state abbreviation and color them green. Broom corn production has shifted westward. Draw a large green arrow from Illinois to these states.
6. Find Mexico on the map. Label it and color it brown. Mexico is a leading producer of broom corn and manufacturer of broom corn brooms.

Broom Corn sweeps through the United States

Use the Illinois map to complete this activity.

1. Using an Illinois map for reference, find Arcola and mark it on the map. Also, include the label "Broom Corn Capital of the World." In 1865, Colonel Cofer, an Arcola resident, experimented by planting 20 acres of broom corn on his land. Soon after, nearly half of the broom corn grown in the United States came from the Arcola area. Today, Arcola farmers produce the broom corn seeds that are planted in other states.
2. Locate Douglas and Coles counties on the Illinois map. Color these counties green. Farmers grow broom corn in both Douglas and Coles counties.
3. Using a purple colored pencil, trace the perimeter of Illinois. Illinois is the center for broom factories and broom corn dealers.
4. Find Galesburg on the Illinois map. Label Galesburg in yellow. In 1846, Swedish settlers established the Bishop Hill colony northeast of Galesburg. The planting and production of broom corn helped improve the colony's financial success. Estimate the location of the Bishop Hill colony and label it in blue.

Broom Corn: Exploring the How and Why

1. How might broom corn have moved across the United States? Who would have helped move it? How did it get there?

2. How would being a leading producer of broom corn impact life in Arcola as a young town?

3. Why does broom corn successfully grow in the south-western states? Why do you think broom corn is mainly produced in Mexico today?

4. On the back of this page, create a broom corn timeline. Be sure to include its history in Illinois .

THE GREAT SWEEP OFF

OBJECTIVE:

Students will learn about Levi Dickenson and how he used an experimental sorghum to make a broom. Then, students will invent their own mini-brooms and discover which invention best sweeps the dirt away!

BACKGROUND INFORMATION:

In 1797, a new experimental sorghum was passed around amongst Massachusetts farmers. Levi Dickenson planted a small patch of the crop in hopes of using it as winter feed for his livestock. In the fall, Levi decided that this new sorghum was a poor grain producer, so he threshed out the seed heads on his barn floor. After doing this, he noticed that the seed-free heads were fine but stiff. Tired of hearing his wife complain about lousy brooms, Levi Dickenson decided that this sorghum would make a great broom. In the winter of 1797, Levi built a broom. Levi's wife was so pleased that he planted all the seeds he had in a half acre the following spring. This was the first recorded cultivation of the sorghum, we now call broom corn.

DIRECTIONS:

1. Share the story of Levi Dickenson with students. Then, discuss how he created a solution to an everyday problem.
2. Challenge your students to invent their own brooms using a variety of materials. See the suggestions listed in the materials section.
3. After the construction phase, allow students to present their inventions to the class. During this presentation, have students share:
    - How the broom was made.
    - What they used and why they chose these materials.
4. As a group, have students predict which brooms will best sweep the dirt away and explain their thinking.
5. Next, place two pieces of 11 X17 paper overlapping on the floor. Tape the paper to the floor and tape the overlapping section. Number papers 1 and 2.
6. Have students measure out 200 mL dirt or other materials (sand, rice, etc.) using a beaker.
7. Then, have students individually test their broom's sweeping ability on the prepared space. Allow students 5 sweeps to sweep the dirt from paper 1 to paper 2.
8. To determine which broom did the best job, have students separate the two pieces of paper. Pour the remaining dirt on paper 1 back into the beaker to measure how much dirt was left by the broom. The broom that has the least amount of dirt remaining on Paper 1 did the best job.
9. Have a class discussion with students about their observations and product design using the discussion questions to the left.

Illinois Learning Standards:
11.B.2a: 11.B.2b; 11.B.2c; 11.B.2d; 11.B.2e; 11.B.2f

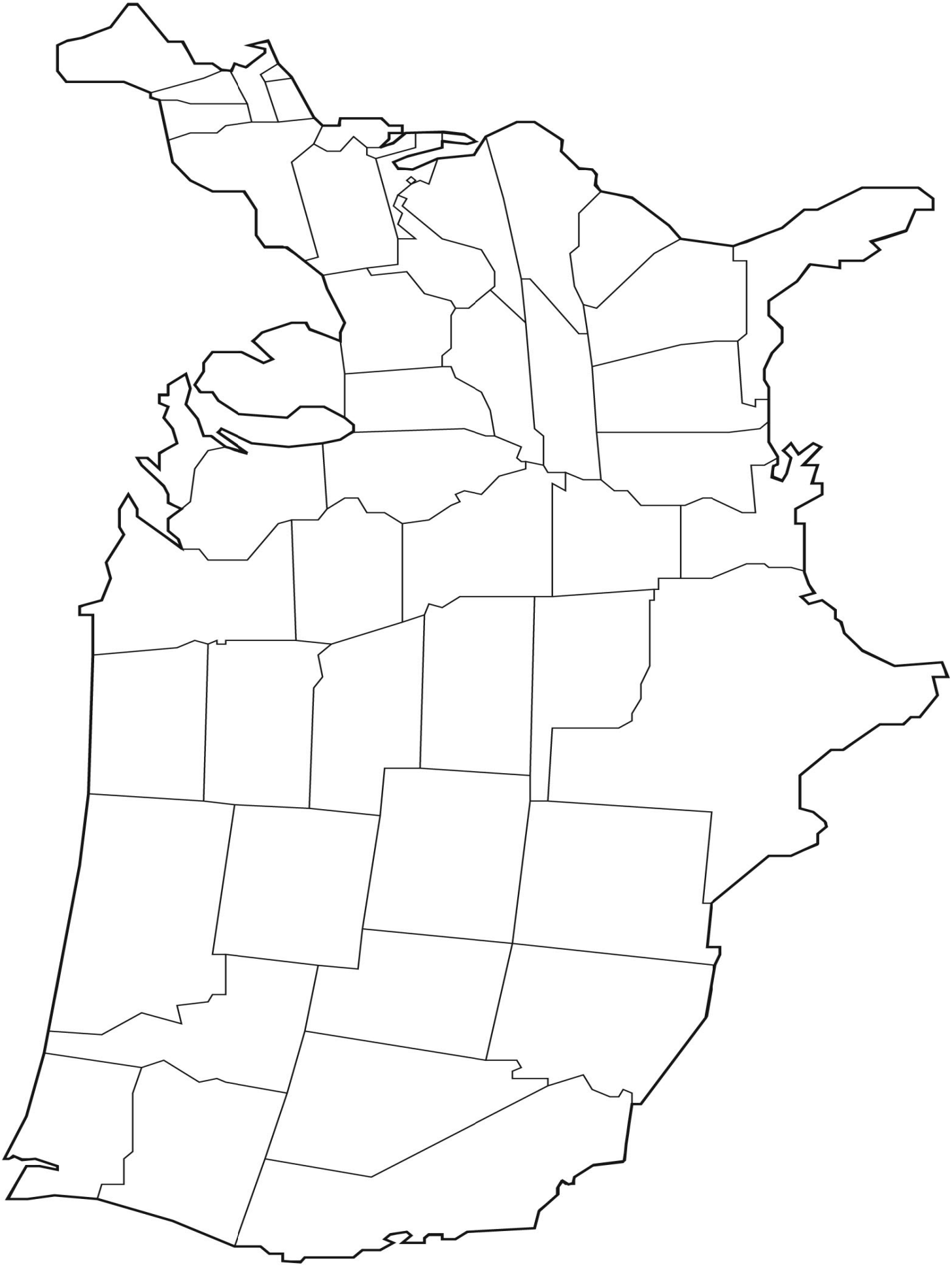
Illinois Assessment Framework:
11.4.05; 11.4.06

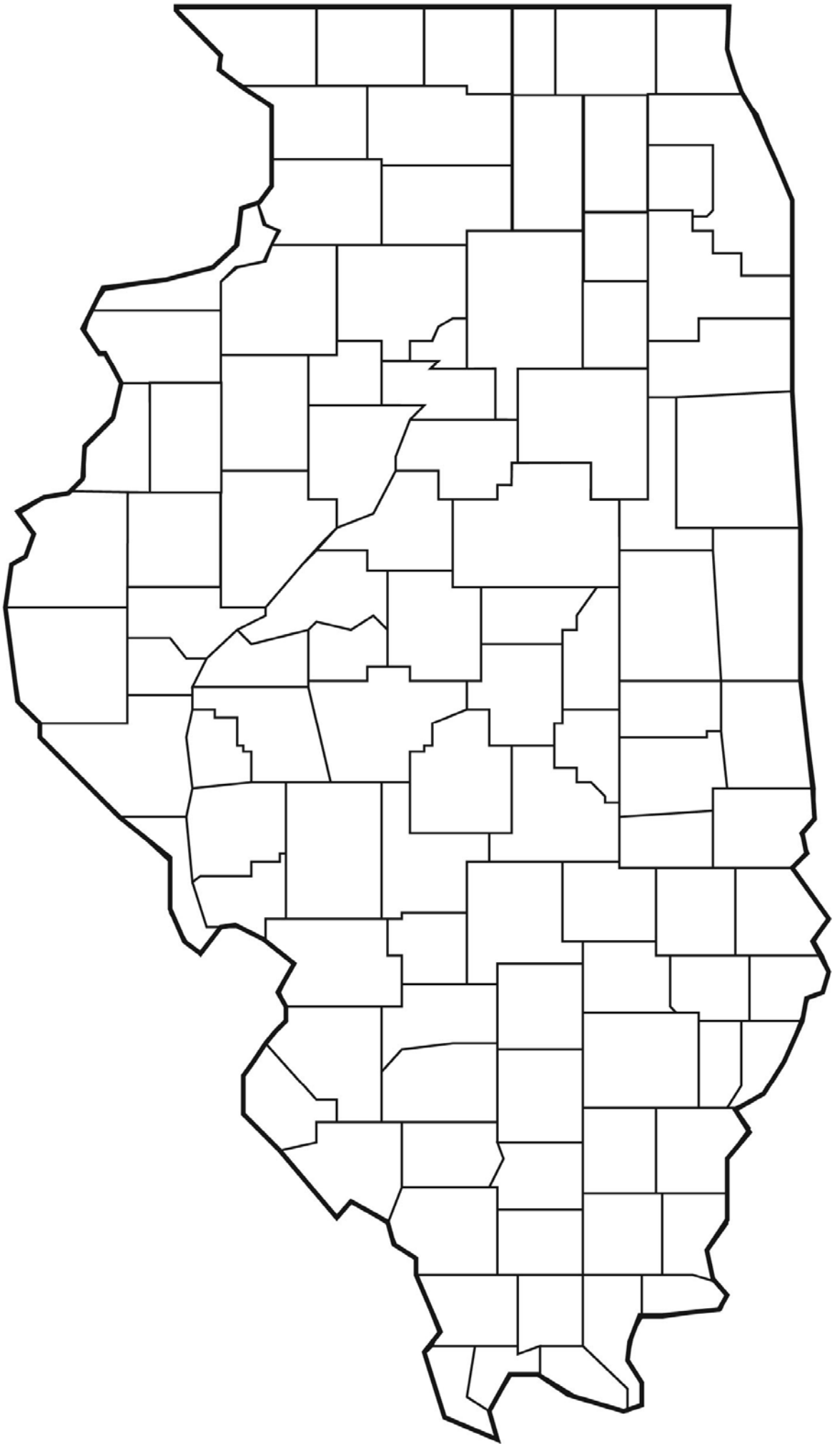
Materials:

- Rubber bands
- Medium sized sticks
- Feathers
- Corn husks
- Twigs
- Straw or hay
- Paper strips
- Straws
- Broom corn
- Paper clips
- Pipe cleaners
- 11 x 17 Paper
- Tape
- Scale

Discussion Questions:

- Which materials used are similar to broom corn? How?
- What will happen to your broom with continued use?
- What other inventions can you think of for an every day problem?





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