SC Farm Bureau
Ag in the Classroom
Post Office Box 754
Columbia, SC 29202

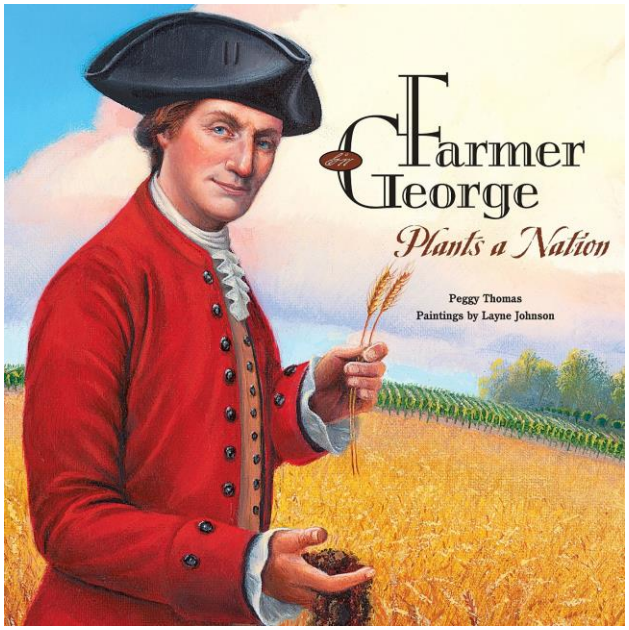
803.936.4237
SC Ag in the Classroom
@SCagintheclass

February 2020 Book of the Month

Farmer George Plants a Nation

By: Peggy Thomas

This picture book for older readers focuses on George Washington as a farmer, inventor, and scientist. Infused with excerpts from George's letters and diaries, the narrative makes a convincing case for Washington's place as the nation's First Farmer. He invented a combination plow-tiller-harrow, tested different fertilizers, and bred donkeys and horses to create strong mules. His goal to make Mount Vernon self-sufficient carried over to his goal to make the new country independent. Layne Johnson's richly colored oil paintings portray the Colonial era with fine details. The book includes a timeline of Washington's life; shares his views on slavery, and includes a bibliography of additional reading materials and websites.[1]



Did You Know? (Ag Facts) [2]

- George Washington kept his own books and recorded every penny of expense and profit. His ledgers still exist today.
- Initially growing tobacco, Washington realized that grains (wheat) were much more sustainable for him. Today, wheat is grown in 42 states.
- Washington is credited with introducing the mule to America.

Discussion Questions

- What personal characteristics made Washington successful?
- Why do you think the author chose this title for the book?
- What did George Washington believe the prosperity of America depended on?

Grade Level(s): 3-6

Purpose: Students will pursue a process of inquiry to profile George Washington, understanding and evaluating the personal characteristics that made him a great leader, while also exploring historical and modern food systems.

Vocabulary:

- **leadership:** the position or function of a leader, a person who guides or directs a group
- **farmer:** a person who cultivates land or crops or raises animals

Background Agricultural Connections:

When a young George Washington took over his family's farm at Mount Vernon, he faced many difficulties. Managing a plantation meant understanding and coordinating soil, seeds, climate, labor, market forces, and equipment. Tripling the size of the plantation (which he did at Mount Vernon) required something more: curiosity, observation, ingenuity, and attention to detail. Washington began his mission to improve Mount Vernon by researching what was already written about agriculture. Finding some of the plantation's needs still unmet, he pioneered solutions for improving soil quality, increasing labor efficiency, and reducing loss during harvest. Washington also quickly recognized that producing tobacco for England and paying high taxes to import necessary goods in return was not a sustainable model. Accordingly, he turned the plantation's purpose to meeting the needs of the local economy—a small step toward the American independence his **leadership** would later exemplify. Perhaps most importantly, Washington's experiences as a **farmer** helped form his character, furthering his leadership abilities and preparing him to lead a "rag tag" group of colonists into battle, and then, a nation into peace.

George Washington is well known as a brilliant military leader. He spent eight years as Commander in Chief of Virginia's troops during the French Indian War (1754-1763) and then led the Continental Army to victory in the American Revolution (1776-1783). During that time he was revered for his ability to appoint strong leadership, maintain positive relationships with local leaders, and hold together a struggling army. His careful oversight of battle tactics and coordination of forces against superior numbers was an important factor in the colonists' success. Washington's hard-earned reputation for insightful leadership, gained largely from these military campaigns, led to his unanimous election as first president of the United States.

Fashioning what it meant to be a president was an enormous challenge. Unable to rely on precedent, George Washington needed his ingenuity and conscientious powers of observation more than ever. It was up to him to establish policies and procedures his successors would follow, including: how to appoint and oversee an effective administration; how to negotiate between the widely varied issues facing each state and the national well-being; and how a president conducts him or herself to preserve the dignity of the office. As in his roles as farmer and general, President Washington had to understand and coordinate diverse needs. He did this by touring the newly formed nation, listening to local leaders, and sharing his own ideas. George Washington died two years after his retirement to Mount Vernon, the place that ultimately forged the farmer, the general, and the president.

Farmer George Plants a Nation [2]

Materials:

- *Farmer George: The Seeds of a Presidency* graphic organizer
- *Farmer George Plants A Nation* by Peggy Thomas
- *Modern Marvels: World's Largest Combine* video
- *How Flour is Made* video

Procedures:

1. Pass out copies of the graphic organizer *Farmer George: The Seeds of a Presidency*, and read aloud the book *Farmer George Plants a Nation*. Pause every couple of pages to give students time to fill in what Washington did and what he was like on their graphic organizers. Provide as much guidance in this process as you feel your students need. (Not every accomplishment and characteristic will fit in the organizer; help students focus on the main ones.)
2. When you've finished reading the book, direct students to do a two-minute "turn and talk" with the person next to them. They should discuss what they think was Washington's most important accomplishment, and what personal characteristics made him so successful.
3. Guide the class in a discussion about Washington's accomplishments and characteristics. Help students extend their thinking by challenging them to identify why each accomplishment was important and what consequences could have occurred had Washington failed. Aid them in making connections between characteristics and accomplishments.
4. Discuss how being a farmer contributed to Washington's leadership ability. Explain to students that 90% of working people in the United States worked as farmers in 1790. Today, just 2% of working people are farmers. Modern technology for growing, harvesting, and processing crops has become very efficient, allowing a small number of farmers to feed a large number of people.
5. Remind students of the strong mules that Washington bred (p. 23 in *Farmer George Plants a Nation*) and the innovative barn that he designed for treading wheat (p. 26). In Washington's time, animals did a lot of work for farmers. Today, most of that work is done by machines that are bigger, faster, and more powerful than mules and horses. Show students the videos Modern Marvels: World's Largest Combine and How It's Made: Flour, and ask them to compare and contrast these modern technologies with those that Washington developed.

All About Wheat [3]

Materials:

- *Wheat Reader*
- Student iPads or smartphones with the "Kahoot" app loaded
- Sticky notes or journals

Procedures:

1. Divide the class into groups of 3-5 students. Print 1 copy of the *Wheat Reader* for each group or individual student.
2. Instruct the students to read the *Wheat Reader* and take notes about what they are learning on the "sticky notes" or in their journals.
    - Increase the effectiveness of this reading strategy by first discussing with the students some of the things they will learn as they read.
    - List the following questions on the board as a guide for the notes they should take on their activity sheet:
        - What does a wheat plant look like?
        - What is wheat used for?
        - What are the parts of a wheat plant?
        - What machines are used to plant and harvest wheat?
3. When reading time is complete, review the basic information about wheat by playing the "All About Wheat" Kahoot game. Kahoot is a game-based classroom response system. First-time users will need to sign up for a free account. Kahoot can be used in the classroom with iPads, iPods, tablets, or smart phones. If individual student access is not available, classes can participate as a group by projecting the quiz on a screen

Bread in a Bag [2]

Materials:

- 2 cups all-purpose flour
- 2 cups whole wheat flour
- Warm water
- 2 tablespoons sugar
- 1 package yeast or 2-1/4 teaspoons (quick rise yeast will speed things along)
- 2 teaspoons salt
- 1 tablespoon oil
- Plastic wrap
- Cooking oil spray
- Heavy-duty Ziploc bag
- Food handlers gloves (available from restaurant supply stores or school cafeteria)
- Various measuring cups and spoons
- Cookie sheets
- Oven

Procedures:

1. Making bread is an art and a science. Prepare for making "bread-in-a-bag" by obtaining enough ingredients for each loaf. It is best to divide your students into groups of two, but groups of four will also work.
2. Heavy-duty Ziploc bags will ensure that you will not have rips or tears causing a mess. Also the bag keeps the process neat and fairly sanitary. If you are making bread as a microorganism experiment, vary the yeast, sugar, salt, or water temperature for interesting results. The only time your students will touch the dough is when it is placed on the cookie sheet. (A cookie sheet is what is most readily available in school cafeterias, and kids can make different shaped loaves for identification. You won't need 15 bread pans!) Only one student needs to place the dough on the cookie sheet. Cheap food handlers gloves sprayed or coated with vegetable oil work great for this transfer.

3. The observations of the dough can be made throughout the kneading process. Doughs with extra sugar will seem quite a bit wetter, while those with extra yeast will seem quite hard. Students should record their observations while making the bread, while it rises (compare quick rise yeasts with regular yeasts), and then again after the bread is baked (texture, flavor, etc.).
4. In a one-gallon (heavy-duty) Ziploc bag, mix: 1/2 cup all purpose flour 1 pkg. or 2-1/4 teaspoons yeast 1/2 cup warm water 2 tablespoons sugar.
5. Close the bag and knead it with fingers until the ingredients are completely blended.
6. Leave the bag closed, with the contents in the corner, and let rest 10 minutes. You can eliminate this wait by using instant yeast.
7. Then add: 2 cups whole wheat flour 3/4 cup warm water 1 tablespoon vegetable oil 2 teaspoons salt Mix well. Add enough all-purpose flour to make a stiff dough, about 1 or 1-1/2 cups.
8. Close the bag and knead it (you may need to remove some air in the bag). Add more flour until dough no longer sticks to the bag.
9. Spray the hands or gloves (food handlers gloves) with oil so there will be no sticking.
10. Open the bag and allow the dough to fall out onto clean or gloved hands.
11. Form the dough into a loaf, and place in a loaf pan or onto a cafeteria cookie sheet. Remember the dough will grow 1-1/2 times larger, so leave space between loaves if baking on a cookie sheet.
12. Cover the loaves with oil sprayed plastic wrap and allow to rise 30 (quick rise yeast) to 45 minutes.
13. Bake for 30-35 minutes in a 350 degree oven.
14. Now that's "real world" science! Students can actually figure out what yeasts need to live and what they produce as wastes, gas bubbles, or wonderful bread aroma. For more information about making bread visit the Bread World website.

Extension Activities: [2 – 3]

- Have students write a letter to the President and ask what he or she eats for breakfast.
- Analyze *George Washington's Breakfast*, and use it to generate a class pattern for researching important questions. Use this as a lead-in for a research unit, project, or essay.
- Provide students with information about seeds, soil, climate, companion planting, and planting zones. Have them design their own gardens to feed their families.
- Make paint out of soil. "Instructions for Making Soil Paints" at www.nrcs.usda.gov
- Take a virtual tour of Mount Vernon at www.mountvernon.org
- Create a visual timeline, from the back of the book, of George Washington's life. Assign various students different points along the timeline and have them research the event further to share with the class.
- Read *Thomas Jefferson Plants a Nation* and complete a Venn Diagram comparing and contrasting the two presidents.
- Read *Compost Stew: An A to Z Recipe for the Earth*.

Suggested Companion Resources: [2]

- Thomas Jefferson Grows a Nation (Book)
- Colonial House (Multimedia)
- Modern Marvels: World's Largest Combine (Multimedia)

Sources/Credits:

1. Thomas, Peggy. *Farmer George Plants a Nation.* Calkins Creek, 2008.
2. Utah Ag in the Classroom
3. Kansas Ag in the Classroom

Suggested SC Standards Met:

English/Language Arts:

- 3.RI.5.1 Ask and answer literal and inferential questions to determine meaning; refer explicitly to the text to support inferences and conclusions.
- 3.RI.8.1 Explain how the author uses words and phrases to inform, explain, or describe.
- 3.RI.8.2 Use knowledge of appendices, timelines, maps, and charts to locate information and gain meaning; explain how these features contribute to a text.
- 3.RI.10.1 State the author's purpose; distinguish one's own perspective from that of the author.
- 4.RI.5.1 Ask and answer inferential questions to analyze meaning beyond the text; refer to details and examples within a text to support inferences and conclusions
- 4.RI.8.1 Determine how the author uses words and phrases to shape and clarify meaning.
- 4.RI.8.2 Apply knowledge of text features to gain meaning; describe the relationship between these features and the text.
- 5.RI.8.1 Analyze how the author uses words and phrases to shape and clarify meaning.
- 6.RI.5.1 Cite textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.
- 6.RI.7.1 Integrate information presented in different media or formats to develop a coherent understanding of a topic or issue.

Social Studies:

- 4.1.CC Identify patterns of change and continuity in the development of economic systems in British North America.
- 4.2.P Analyze the sequence of events that led to the establishment of the US as a democratic republic.

Math:

- 3.MDA.2 Estimate and measure liquid volumes (capacity) in customary units (i.e., c., pt., qt., gal.) and metric units (i.e., mL, L) to the nearest whole unit.

Science:

- 4.L.5 The student will demonstrate an understanding of how the structural characteristics and traits of plants and animals allow them to survive, grow, and reproduce.
- 5.L.4: The student will demonstrate an understanding of relationships among biotic and abiotic factors within terrestrial and aquatic ecosystems
- 6.L.5: The student will demonstrate an understanding of the structures, processes, and responses that allow protists, fungi, and plants to survive and reproduce.

Name_____Date_____

Farmer George: The Seeds of a Presidency

Directions: In our quest to understand how George Washington became a powerful leader, we will learn about many things that he did. We will also learn about many of his personal characteristics. As we read *Farmer George Plants a Nation*, keep track of the main points in the chart below.

What He Did

Example: Owned and managed a large plantation, Mount Vernon

What He Was Like

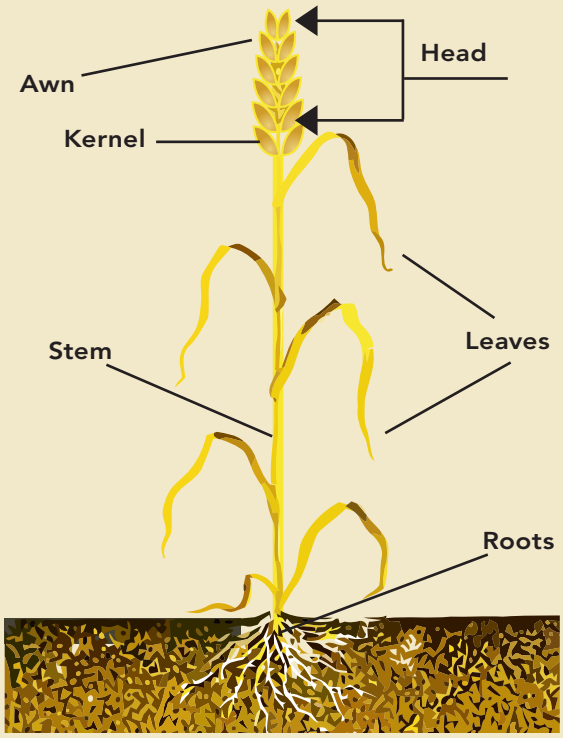
Example: Innovative, creating a lot of new farming tools and practices

WHEAT

USES: bread, cookies, pancakes, waffles, ice cream cones, macaroni, spaghetti, pizza, pet foods, soap, newsprint, wallboard, cosmetics

WHAT IS WHEAT?

Wheat is a grain (a plant that produces a dry edible seed called a kernel) used mostly for human consumption. Wheat is an annual grass plant that will grow 2 to 3 feet tall. There are two major types of wheat planted in the United States. They are winter wheat and spring wheat. Winter wheat is planted in September and harvested the following summer. Spring wheat is planted in April or May and is harvested in August or September. Wheat starts as a seed and begins to grow when there is enough moisture in the soil. The first signs of growth are tiny root hairs that stretch down into the soil while a small shoot pushes upward through the soil. Tissue within the wheat seed provides the plant with its first nourishment. As the plant grows, it uses the sun to make food in its leaves. The roots get food from the soil. Wheat grows many leaves and sends up 3-12 stems called tillers. A group of flowers called a spike develop at the top of each tiller and mature into the wheat head. Kernels within the head grow and turn golden brown before harvest.



VOCABULARY

AWN: a bristle-like attachment of a wheat plant.

BEARD: the bristle-like parts of the wheat plant that cover and protect the kernels.

BRAN: the outer coating of the wheat kernel.

BUSHEL: a way to measure a crop. One bushel of wheat weighs 60 pounds and contains about 1 million kernels.

CHAFF: the husks of grains and grasses that are separated during threshing.

GERM: the embryo or nucleus of the wheat kernel, used in or on foods as a concentrated source of vitamins.

HEAD: the part of the wheat plant that contains the kernels.

MILL: the place where wheat kernels are ground into flour.

SPIKE: an ear of grain, as of wheat.

STALK: the entire wheat plant.

STRAW: a single stalk or stem, especially from certain species of grain, mostly wheat, rye, oats and barley.

THRESH: to beat the stems and husks of grain or cereal plants with a machine to separate the grains and seeds.

TILLER: an erect shoot arising from the crown of a grass.

WHEAT GERM: the embryo of the wheat kernel that will develop into a wheat plant.

WHEAT KERNEL: the seed, sometimes called a wheat berry, from which the wheat plant grows.

WHEAT FUN FACTS:

Wheat is grown in nearly every state. Because it is such a versatile crop, it is being harvested somewhere in the world every month of the year.

A bushel of wheat weighs about 60 pounds and yields about 42 pounds of white flour or 60 pounds of whole wheat flour.

Bread, pasta, cereal, pretzels and licorice are all foods made with wheat. Cosmetics, pet foods, paper, soap and trash bags also contain wheat.

A kernel is a wheat seed. There are about 50 kernels in a head of wheat and 15,000 to 17,000 kernels in a pound.

The average price received by U.S. farmers in 2011 was $5.70 per bushel.

WHEAT HISTORY TIMELINE

15000 B.C. — Seed gathering.

10000-9000 B.C. — Early people learned cultivation and stayed in one place to farm grain. Villages formed. Civilization began.

7000-6000 B.C. — Swiss lake dwellers ground wheat kernels, mixed flour with water and baked the first flatbreads.

3000 B.C. — Egyptians cultivated wheat and baked bread.

B.C./A.D. — Chinese cultivated wheat and baked bread.

1683 — The first bagel rolled into the world when a baker from Vienna, Austria was thankful to the King of Poland for saving Austria from Turkish invaders. The baker reshaped the local bread so that it resembled the King's stirrup. The new bread was called "beugel," derived from the German word stirrup, "bugel."

1777 — Wheat is planted for the first time in the U.S.

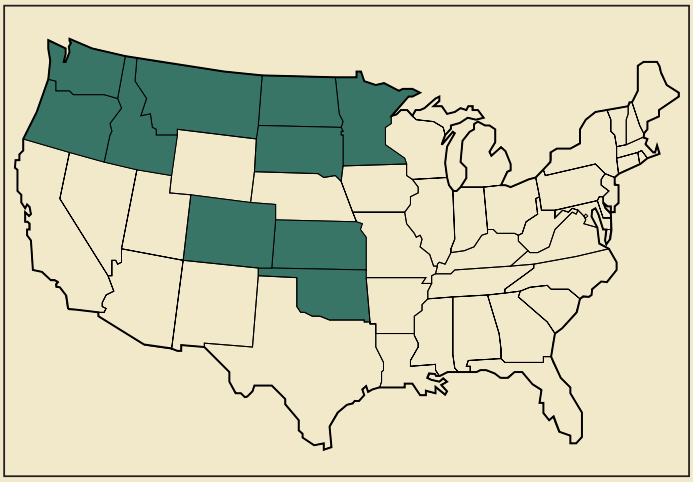
1800 — U.S. harvest rate is 8 acres per day.

1921 — Wonder Bread was originally produced by the Taggart Baking Company. It was named by Vice President Elmer Cline.

1999 — U.S. harvest rate is 120 acres per day.

2008/2009 — U.S. farmers grew nearly 2.4 billion bushels of wheat on 63 million acres of land.

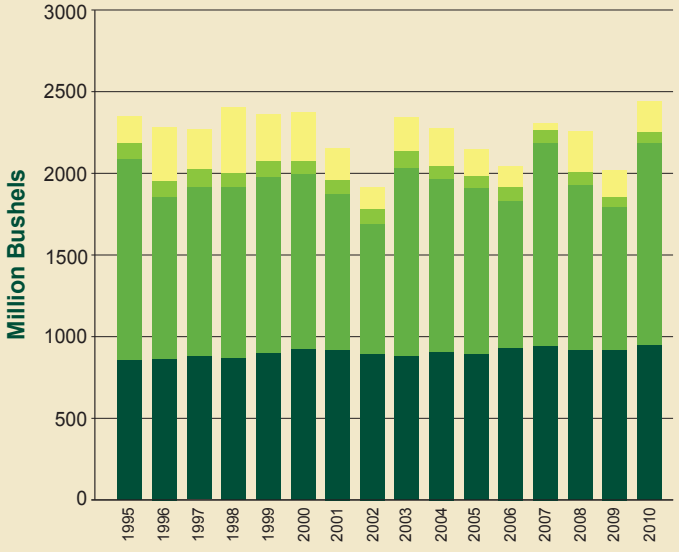
2011 UNITED STATES WHEAT PRODUCTION



Top wheat producing states

Kansas, North Dakota, Montana, Washington, Idaho, South Dakota, Colorado, Oregon, Minnesota, Oklahoma

U.S. Wheat Use



WHEAT

CAREERS: Remote Sensing Specialist, Commodity Broker, Farmer, Soil Scientist, Food Process Engineer, Human Nutritionist

SPOTLIGHT ON CAREERS:

REMOTE SENSING SPECIALIST — Remote Sensing Specialists interpret and analyze many types of aerial photographs and satellite images. They may use color infrared photos to map irrigated cropland, or to determine areas of insect or disease infestation in croplands. They use computers to analyze satellite scanner data and create maps of land cover and changes in land use.

COMMODITY BROKER — A **Commodity Broker** is a firm or individual who arranges transactions, on behalf of clients, to buy or sell contracts for commodities such as corn, soybeans, livestock and wheat.

WHEAT USE IN THE UNITED STATES

ONE BUSHEL OF WHEAT:

Weighs about 60 pounds, yields about 42 pounds of white flour and around 60 pounds of whole-wheat flour.

Makes 90 one-pound loaves of whole-wheat bread.

Fills 53 boxes of cereal.

Makes 72 pounds of flour tortillas.

Bakes into 800 sponge cakes.

Rolls into 420 three-ounce cinnamon buns.

Makes 5,000 four-inch cookies.

The average price received by U.S. farmers in 2011 was $5.70 per bushel.

* Depends on the class of wheat

WHEAT PATH

The wheat seeds are put into the ground by a machine called a grain drill. The drill is pulled by a tractor and digs narrow rows in the earth and drops the wheat seeds into the rows. Then it covers the seeds with soil so they can take root.

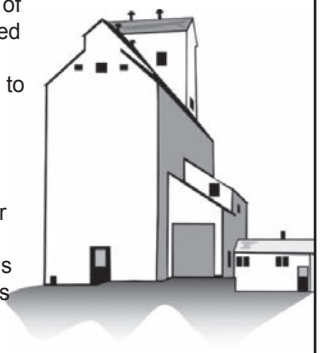
The seed begins to grow when there is enough mositure in the soil. The tiny root hairs stretch down into the soil and eventually a small shoot pushes upward through the soil. The tissue within the wheat seed is how the plant is nourised. As the plant grows it uses the sun to make food in its leaves. The roots get food from the soil.

The wheat plant grows many leaves and sends up 3 to 12 stems called tillers. A group of flowers called a spike develop at the top of each tiller and mature into a wheat head.

Kernels within the head grow and turn golden brown before harvest. The wheat must be dry before it can be harvested.

A combine is used to cut the wheat stalk. It also does the threshing, separating the kernels from the rest of the plant. The threshed grain is stored in a bin on the machine. The bin is emptied into a grain truck and taken to the grain elevator.

From the elevator, the wheat will be sold to be processed into food for humans or livestock feed. Wheat is ground into flour at a mill. The flour is then used to make products, such as rolls, cookies, bagels, and tortillas.



SCIENCE AT HOME

WHEAT MILLING

Materials: Wheat Stalks, Salt or Pepper Grinder

Directions:

1. Show students wheat stalks.
2. Go over the parts of the wheat stalk with the students to familiarize them with the parts so they can understand the directions for dissection.
   A. **STALK** — the entire plant.
   B. **HEAD** — the part of the wheat plant that contains the kernels.
   C. **BEARD** — the bristle-like parts of the wheat plant that cover and protect the kernels.
   D. **KERNEL** — the seed from which the wheat plant is grown or that people harvest from the wheat plant to grind into flour.
   E. **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:
   A. Hand out stalks of wheat to the students.
   B. Break the head off the stem.
   C. Make a straw out of the stem by breaking it to avoid the nodes.
   D. Lay the wheat head flat on a hard surface and pat with your hand to shake out the kernels.
   E. Have the students count their kernels.

WHEAT

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.*

2011 WHEAT STATISTICS

Class and Market Year	Planted acreage (million acres)	Harvested acreage (million acres)	Production (million bushels)	Yield (bushels per acre)	Weighted average (dollars per bushel)
All Wheat (2011/2012)	54.41	45.71	1999.35	43.7	7.25
Hard Red Winter (2011/2012)	28.480	21.441	780.09	36.4	--
Hard Red Spring (2011/2012)	11.589	11.295	397.69	35.2	--
Soft Red Winter (2011/2012)	8.561	7.420	457.54	61.7	--
White (2011/2012)	4.410	4.237	313.55	74.0	--
Durum (2011/2012)	1.369	1.312	50.48	38.5	9.90

Agriculture in the Classroom USDA

THE UNIVERSITY OF ARIZONA. Cooperative Extension

www.agclassroom.org / www.agintheclassroom.org / http://cals.arizona.edu/agliteracy