

## FARMING – Upper Elementary

### Purpose

To educate students on the importance of farming and the role of farming, including the farmer, farm animals, plants, farm equipment, and more. Students will learn the life cycle of a plant and apply what they have learned in hands-on learning experiences to grow their knowledge and appreciation for farming.

### Subject Area(s)

English Language Arts, Science, and Math

### Common Core/Essential Standards

#### English Language Arts

- **CCSS.ELA.L.W.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

#### Math

- **CCSS.M.3.OA.A.1** Interpret products of whole numbers, e.g., interpret  $5 \times 7$  as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as  $5 \times 7$ .*
- **CCSS.M.3.OA.B.5** Apply properties of operations as strategies to multiply and divide.2
- **CCSS.M.4.OA.A.1** Interpret a multiplication equation as a comparison, e.g., interpret  $35 = 5 \times 7$  as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
- **CCSS.M.4.MD** Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

#### Science

- **3.P.1.1** Infer changes in speed or direction resulting from forces acting on an object.
- **3.L.2.1** Remember the function of the following structures as it relates to the survival of plants in their environments: Roots – absorb nutrients, Stems – provide support, Leaves – synthesize food, Flowers – attract pollinators and produce seeds for reproduction
- **3.L.2.2** Explain how environmental conditions determine how well plants survive and grow
- **4.P.1** Explain how various forces affect the motion of an object.

- **4.L.1** Understand the effects of environmental changes, adaptations and behaviors that enable animals (including humans) to survive in changing habitats.
- **4.L.1.1** Give examples of changes in an organism’s environment that are beneficial to it and some that are harmful.
- **4.L.1.3** Explain how humans can adapt their behavior to live in changing habitats (e.g. recycling wastes, establishing rain gardens, planting trees and shrubs to prevent flooding and erosion).
- **5.P.1** Understand force, motion and the relationship between them.
  - **5.P.1.1** Explain how factors such as gravity, friction, and change in mass affect the motion of objects.
- **5.E.1** Understand weather patterns and phenomena, making connections to the weather in a particular place and time.
  - **5.E.1.1** Compare daily and seasonal changes in weather and conditions and patterns.

## **Agricultural Literacy Outcomes**

### **Agriculture and the Environment**

- Explain how the interaction of the sun, soil, water, and weather in plant and animal growth impacts agricultural production

### **Plants and Animals for Food, Fiber & Energy**

- Provide examples of specific ways farmers/ranchers meet the needs of animals

### **Science, Technology, Engineering, and Math**

- Compare simple tools to complex modern machines used in agricultural systems to improve efficiency and reduce labor
- Describe how technology helps farmers/ranchers increase their outputs (crop and livestock yields) with fewer inputs (less water, fertilizer, and land) while using the same amount of space

### **Culture, Society, Economy & Geography**

- Explain the value of agriculture and how it is important in daily life

## **Essential Questions**

1. What do farmers do on the farm?
2. Why is farming important?
3. How does the farmers role change during each season on the farm?
4. What important roles does farm equipment play on the farm?

5. Explain the lifecycle of a plant.
6. How is understanding the lifecycle of a plant useful in growing your own plants?
7. How do simple machines help farmers on the farm?

## Vocabulary

**Agriculture:** science or occupation of cultivating soil, producing crops, and raising livestock.

**Farm:** a piece of land used for growing crops or raising animals.

**Tractor:** a large vehicle that has two large back wheels and two smaller front wheels used to pull farm equipment.

**Harrow:** an implement consisting of a heavy frame set with teeth or tines that is dragged over plowed land to break up clods, remove weeds, and cover seed.

**Planter:** A machine or tool for planting **seeds**.

**Plow:** a large farming implement with one or more blades fixed in a frame, drawn by a tractor or by animals and used for cutting furrows in the soil and turning it over, especially to prepare for the planting of seeds.

**Fertilizer spreader:** is a farm implement commonly used for spreading seed, lime, **fertilizer**, sand, etc.

**Harvest:** the season when crops are gathered from the fields or the activity of gathering crops.

**Barn:** a building on a farm that is used for storing grain and hay and for housing farm animals or equipment.

**Fruits:** a usually sweet food (such as a blueberry, orange, or apple) that grows on a tree or bush; the part of a plant that has the seeds in it (such as the pod of a pea, a nut, a grain, or a berry).

**Vegetables:** relating to, constituting, or growing like plants.

**Animals:** a living thing that is not a human being or plant.

**Season:** a time characterized by a particular circumstance or features.

## Student Motivator

Show students a picture of a farm. Ask them a few brainstorming questions:

- What comes to mind when you see this picture?
- How many of you live on a farm?
- How does it affect you?

**Did You Know** that less than 2% of our population is directly connected to the farm. Now more than ever we need to support our farmers, but in order to do that we have to understand the world of farming.

**Background Knowledge** Farming is a very important career, farming feeds us, clothes us, provides us with the things we need to survive. However, there are not many people that are directly connected to

the farm, in fact less than 2% of the US population is directly connected to the farm, but our nation keeps getting bigger and bigger. You may be asking yourself how this affects you or what can you do to help. Well believe it or not by learning about production agriculture and farming you can tell others what you know and they tell others what they know, eventually people will begin to understand what our nation was founded on – agriculture.

It is also important to remember that farmers do not do it by themselves, it takes a lot of other people and machines to make their work possible. Could you imagine designing a piece of equipment that could help farmers produce more food? Even make it easier to take care of their animals? Imagine all the different things that can be done on the farm – that could be you. Educating ourselves about the possibilities of life on the farm is a way to help our farmers feed the world.

## Materials

- Small bucket
- Slips of paper
- *Farming* by Gail Gibbons (book)
- Large tray/cookie tray
- Thermometer
- Dirt
- Slips of paper
- Chart paper
- Tooth picks
- Seed packs: Sunflower, Dandelion, tomato, corn, peas, lettuce, squash, etc.
- Agricultural related books (optional)
- Ipads (optional)
- *Observation Journal Sheet Example*
- *Plant Life Cycle Cut & Paste* (Worksheet)
- Craft materials: cups, pipe cleaners, tape, glue, scissors, rubberband, plates, cardboard boxes, bottle caps, lids, etc.
- Potting soil
- Rubber bands
- Markers/crayons
- Plastic or clay pots, large tray

## Procedures Activity 1

1. Begin by passing around a post-it note or small piece of paper to every student. Ask students to close their eyes and ask the question: what is the first thing that comes to mind when I say the word Farming? Students should jot down ideas quickly (draw a picture, write a word).
2. Have students put their cards into a bucket. The teacher will take cards out of the bucket and in a discussion ask students what they know about farming.
3. Begin K section on chart paper as the beginning of a KWL chart.
4. After the K section is completed. Ask students what they would like to learn about Farming. Begin W section on chart paper to complete the W on the KWL chart.
5. Introduce *Farming* by Gail Gibbons, read book aloud.
6. Follow the same idea above have students write ideas on a post-it/slip of paper to see what they learned or ideas they want to learn more about, take up the papers.
7. Compare students original ideas and ideas after reading the book by spreading them into two columns on the floor.
8. Have students look around and compare ideas. Complete the L (learned or want to learn more about) section of the KWL chart.
9. As an extension activity provide students with the opportunity to find more information about farming, using fun agriculture facts or searching ideas on google.

## Activity 2

1. Take a few packets of seed and put them into a small bucket, pass bucket around and have students choose one or two seeds.
2. Have students make a prediction about what type of seed they have (obviously most will know off hand what type of seed they have).
3. Pass out toothpicks, small slip of paper, and piece of tape. Use these materials to make a seed label. Have students put their name on the label too.
4. Provide students with materials to plant their seed: compost soil, small pot or large planter (*for whole class or vegetables, a garden box may be more appropriate*) and water.
  - This is a great way to incorporate area/perimeter (3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>) standards or multiplication/arrays (3<sup>rd</sup>) – divide a small or large garden box into a section for each student with toothpicks tied to string. Refer to images.



5. Explain to students that they will care for their seeds just as farmers care for seeds they plant. Although our project is on a much smaller scale, students will understand the important role that the soil, sun, and water play in the life of plants (show essential links *Timelapse of a Sunflower*).
6. After students have planted seeds, provide them with a *Observation Journal*. Students will use this journal to track changes of plant growth including amount of water, sunlight/weather conditions (temperature, wind, etc.), and draw a picture of the plant as it changes.

### Activity 3

1. After reading the book *Farming* by Gail Gibbons bring students attention to page seven. Explain to students that the focus today is on the equipment seen in the four windows of this page.
2. First fertilizer spreader, plow, harrow, and planter. Describe the unique role each piece of equipment as it is used on the farm.
3. Explain to students that they are going to be creating simple machines that allow some of the same movement as the different pieces of equipment from this page. The simple machines we will focus on are wheel and axle: used to carry loads around easily for long distances with less effort. Notice the wheels and discs on the different pieces of farm equipment.
4. Put students into small groups (3-4) and provide them with a bag of materials. Materials could include: paper towel roles, straws, pipe cleaners, plastic bottles, plastic bottle caps, cups, marbles, table, pool noodles, spaghetti, popsicle sticks, string, etc.
5. Allow students to work collaboratively to create a simple machine that they will use in a tray of dirt to demonstrate how a different piece of farm equipment works in the field.
6. After this activity, show students short video clips of farm equipment and its use on the farm (optional).
7. **Exit Ticket:** Explain one use of a piece of farm equipment in the field and why you think it is important. Some Ideas: tractor, planter, spreader



#### Activity 4

1. **Day One:** Before you begin the lesson quickly review the book *Farming* by Gail Gibbons, recount all of the different things learned about the farm: equipment used, animals, caring for the animals, different things grown on the farm, and chores on the farm.
2. Explain to students that they will be choosing a topic to complete a book report – the topic can be anything that was discussed during and after reading of the book *Farming* by Gail Gibbons.
3. Display book report pages for all students to see.
4. Next, have students collaboratively brainstorm ideas that would create an interesting book report, with facts learned from the text that could educate others about farming.
5. Once the classroom group page/pages are complete discuss with students guidelines that you expect them to follow: number of facts, number of pages, sources of work, art work, connection to standards, etc.
6. **Day Two:** Provide students with time to visit the school library (or have the librarian pull different farming topic books prior to this) or allow students to research in the computer lab or on Ipads to provide them with enough material to create an accurate and useful book report.
7. Allow students to review the different books or other resources before finalizing their ideas.
8. **Day Three:** Reading and Brainstorming Day. Provide students with essential file *Just the facts* to use for note taking.
9. **Day Four:** Provide students with pages for book report *see essential files* and allow them to complete their final pages.

**Extension Activity:** A great way to provide hands-on experiences with learning is to allow students to visit a lower grade level and share their book report or the book they used to write their book report.

#### Suggested Companion Resources

- *A Year at a Farm* by Nicholas Harris (book)
- Vegetables Grown in North Carolina <http://www.ncagr.gov/stats/general/overview.htm>
- How Many Hats Does A Farmer Wear? (activity) [http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=306&search\\_term\\_cr=farming](http://www.agclassroom.org/teacher/matrix/resources.cfm?rid=306&search_term_cr=farming)

## Essential Files

- [\*Observation Journal\*](#)
- [\*Plant lifecycle worksheet\*](#)
- [\*Just the Facts\*](#)
- [\*Book Report\*](#)

## Essential Links

- Time Lapse of Sunflower  
<https://www.youtube.com/watch?v=Z-iPp6yn0hw>

## Ag Fun Facts

- Mature turkeys have more than 3,500 feathers.<sup>1</sup>
- There are 47 different breeds of sheep in the U.S.<sup>2</sup>
- Pork is the most widely eaten meat in the world.<sup>3</sup>
- The average person consumes 584 pounds of dairy products a year.<sup>4</sup>
- Elevators in the Statue of Liberty use a soybean-based hydraulic fluid.<sup>5</sup>
- Like snowflakes, no two cows have exactly the same pattern of spots.<sup>6</sup>
- The longest recorded flight of a chicken is 13 seconds.<sup>4</sup>
- The average dairy cow produces seven gallons of milk a day, 2,100 pounds of milk a month, and 46,000 glasses of milk a year.<sup>4</sup>
- Turkeys originated in North and Central America, and evidence indicates that they have been around for more than 10 million years.<sup>1</sup>
- Agriculture employs more than 24 million American workers (17% of the total U.S. work force).<sup>4</sup>
- Today's American farmer feeds about 155 people worldwide. In 1960, that number was 25.8.<sup>4</sup>
- Raising beef cattle is the single largest segment of American agriculture.<sup>7</sup>
- One pound of wool can make 10 miles of yarn. There are 150 yards (450 feet) of wool yarn in a baseball.<sup>4</sup>
- Soybeans are an important ingredient for the production of crayons. In fact, one acre of soybeans can produce 82,368 crayons.<sup>4</sup>
- The heaviest turkey ever raised weighed 86 pounds, about the size of an average third-grader.<sup>1</sup>
- Cows are herbivores, so they only have teeth on the bottom.<sup>4</sup>
- There are 350 squirts in a gallon of milk.<sup>4</sup>
- Cows must give birth to a calf in order to produce milk.<sup>4</sup>

## Extension Activities

- Plan a trip to a local farm.

- Have students read and research different farm animals and commodity crops

### Sources & Credits

- <http://www.farmersfeedus.org/fun-farm-facts/>
- [www.ncgar.org](http://www.ncgar.org)
- [www.ncagintheclassroom.com](http://www.ncagintheclassroom.com)

### Ag Facts

1. <http://www.networx.com/article/17-things-you-never-knew-about-turkeys>
2. [http://www.ansci.wisc.edu/extensionnew%20copy/sheep/wisline\\_09/Breeds%20and%20Their%20Uses.pdf](http://www.ansci.wisc.edu/extensionnew%20copy/sheep/wisline_09/Breeds%20and%20Their%20Uses.pdf)
3. <http://www.worldwatch.org/global-meat-production-and-consumption-continue-rise>
4. <http://www.farmersfeedus.org/fun-farm-facts/>
5. [https://www.agclassroom.org/teen/ars\\_pdf/tech/2004/10soy.pdf](https://www.agclassroom.org/teen/ars_pdf/tech/2004/10soy.pdf)
6. <http://www.agclassroom.org/ny/resources/pdf/posters/holycow.pdf>
7. <http://www.explorebeef.org/raisingbeef.aspx>