Objective
Students will read about the importance of agriculture in Oklahoma and explore metaphors to describe it. Students will design and create storyboards based on the theme “Agriculture—The Heartbeat of Oklahoma.”

Background
As you ride along Oklahoma roads it’s hard to miss the importance of agriculture in our state. Look to your right and you see cattle or sheep grazing in a field. Look to your left and you see waving wheat, green fields of soybean or the beautiful yellow flowers of canola. Later in the season you will see white fields of cotton. In the distance you see the tall grain elevators that store the grain waiting to be sold. On the road, you may pass a silver milk truck or a truck packed with giant cylinders of hay or a slatted cattle truck full of cattle on the way to market.

Agriculture is the heartbeat of Oklahoma. Just as your beating heart keeps you alive by pumping blood through your body, agriculture pumps life through our state by providing the food and other materials we need to survive, jobs to keep the economy healthy and even seasonal celebrations that make Oklahoma a fascinating place to live.

Like the beating heart in your body’s circulation system, agriculture circulates food and other products through our food system. Most farmers and ranchers sell to collection points—grain or produce terminals or stockyards. The terminal or stockyard sells to processing companies, which process and package the products we buy in the grocery store. Finished food products are moved by truck or rail to warehouses. Warehouses assemble full truckloads of products for shipment to one large retailer or to many smaller outlets.

And all along the way, agriculture pumps jobs into Oklahoma communities and helps keep our economy moving. According to a 2008 study* at Oklahoma State University, agriculture was responsible for 8.8 percent of total employment in our state, with 188,294 jobs. Agriculture also helps support other segments of the economy—manufacturing, energy and wholesale and retail trade. Farmers and ranchers buy seed, fertilizer, equipment, fencing and more. When they sell their commodities, they generate income and then turn around and spend that income on things like cars, furniture and clothing. Without agriculture the study estimated our economy would lose 1 in 12 employees.

Oklahoma agriculture keeps our hearts beating with a reliable and heart-healthy food supply. Farmers markets offer Oklahoma-grown fruits and vegetables with nutrients important for heart health. Wheat farmers grow healthy whole grains. Animal agriculture provides healthy sources of protein—beef and dairy products, pork, lamb, chicken and eggs. Pecan

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and peanut producers provide other sources of heart-healthy protein.

With the regularity of a heartbeat, Oklahoma agriculture inspires celebrations of the seasons. In spring we celebrate new life. On the farm the fields start to turn green, and there are baby animals everywhere. Farmers plant most of their crops in spring. The summer sun makes everything grow. It is the busiest time on the farm. Mid-summer celebrations provide rest from summer chores and relief from the heat. Fall celebrations began as harvest festivals. In winter work on the farm slows down. It is time for planning for the following growing season. Winter celebrations remind us that the dark, cold days will not last forever, and that the cycle will soon bring spring.

Agriculture truly is the “Heartbeat of Oklahoma.” Without it, how would we survive?


**English Language Arts**

1. Read and discuss the background and vocabulary.
   — Students will find two or more central ideas in the background text and analyze their development. Students will provide an objective summary of the text.
   — Students will outline the passage and analyze the structure and organization. How does it contribute to the development of the theme?
   — Students will draw a diagram to illustrate the movement of agricultural commodities through the food system.

2. Discuss the theme “Agriculture: The Heartbeat of Oklahoma.”
   — Discuss the difference between literal and figurative language. Is agriculture literally the heartbeat of Oklahoma or figuratively? What kind of figurative language does the phrase represent? Discuss metaphor.
   — Students will brainstorm in groups to find other metaphors that describe the importance of agriculture to Oklahoma.

3. Agriculture is like a heartbeat because it circulates nourishment through our food system. Brainstorm some other ways agriculture is like Oklahoma’s heartbeat. What does a heartbeat do? How does it compare with agriculture?

4. Students will make storyboards.
   — Discuss the history and purpose of storyboarding (See www.agclassroom.org/ok
“How to Make a Storyboard,” included with this lesson. In the heiroglyph pictured at the bottom of the page, the figures are threshing and winnowing grain. 1) Raking the ears to the center; 2) The driver; 3)Winnowing, with wooden shovels.
—Students will select a familiar story like “The Three Little Pigs” and practice making storyboards by telling the stories in six panels with simple drawings and one or two sentences to explain each drawing.
—Provide copies of the incomplete storyboard samples included with this lesson. Students will complete the storyboards.
—Students will create their own storyboards to illustrate the theme “Agriculture: The Heartbeat of Oklahoma.” Students should draw neatly and use their best handwriting.

Math
1. Hand out copies of the chart included with this lesson “Agriculture’s Contribution to Employment in Oklahoma, 2008.”
—Discuss the chart as a class, including discussion of the difference between direct contribution, indirect effect and induced contribution.
—Students will write equations to solve the ratio and percentage problems included with the chart and show their work.

Science
1. Read and discuss the information provided on the “Healthy Hearts, Healthy Bodies” page.
2. Provide each student with a toothpick and a very small ball of dough, about the size of a marble, formed from bread. Students will conduct the following demonstration to observe their own heartbeats (pulse). Students will watch carefully while you demonstrate before trying the demonstration on their own.
—Lay your left hand, palm up and still, on a flat surface.
—Find your wrist pulse.
—Stand the dough ball on top of the pulse point and carefully watch the tip of the toothpick.
—You should see the toothpick twitch with each pulse.
—The number of twitches you count in 15 seconds, multiplied by four, should be in the 65-75 range, the normal pulse rate for adults.
—Students will work in groups of two or three so they can perform the experiment while other members of the group watch and count. Students will find that a child’s heart rate is considerably faster than that of an adult.
—Students will repeat the experiment after running in place, jumping, hopping, and spinning.
—Students will record the results of their experiments with appropriate graphs or charts.
3. Students will conduct a taste test with heart-healthy foods like carrots, apples, whole wheat bread, and broccoli.
—Conduct a poll to find out which foods students like best.
—Students will design appropriate graphs to show the results of the poll.

Extra Reading
As you ride along Oklahoma roads it’s hard to miss the importance of agriculture in our state. Look to your right and you see cattle or sheep grazing in a field. Look to your left and you see waving wheat, green fields of soybean or the beautiful yellow flowers of canola. Later in the season you will see white fields of cotton. In the distance you see the tall grain elevators that store the grain waiting to be sold. On the road, you may pass a silver milk truck or a truck packed with giant cylinders of hay or a slatted cattle truck full of cattle on the way to market.

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Agriculture’s Contribution to Employment in Oklahoma, 2008

The total contribution of agriculture to employment in Oklahoma in 2008 was 188,294 jobs. Of this amount, 138,124 jobs resulted directly from agriculture. In the chart below, the direct contributions to the number of jobs created by the agricultural industry are broken into three components:

- Production is defined as growing crops and raising livestock on the farm or ranch.
- Processing is defined as making products from the crops and livestock, e.g., breakfast cereal, canned vegetables, bacon, hamburger meat, etc.
- Ag-related services is defined as support activities for agriculture and forestry, including cotton ginning, soil preparation, crop harvesting, contract labor, pest control, breeding and insemination, etc.

The indirect effect is the estimated number of jobs resulting from the products farmers, ranchers and producers buy from other Oklahoma businesses to support agricultural activities. Indirect effects create an estimated 27,692 jobs in the state.

The induced effects are jobs created by products consumed by the households of persons involved in agriculture. The estimated total of jobs from induced effects is 22,478.

<table>
<thead>
<tr>
<th></th>
<th>Number of Jobs</th>
<th>% Total Contribution</th>
<th>% Total Oklahoma Jobs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>97,056</td>
<td>51.5</td>
<td>4.6</td>
</tr>
<tr>
<td>Processing</td>
<td>33,757</td>
<td>17.9</td>
<td>1.6</td>
</tr>
<tr>
<td>Ag Related Services</td>
<td>7,311</td>
<td>3.9</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Direct Contribution</strong></td>
<td><strong>138,124</strong></td>
<td><strong>73.4</strong></td>
<td><strong>6.5</strong></td>
</tr>
<tr>
<td>Indirect Effects</td>
<td>27,692</td>
<td>14.7</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Direct + Indirect</strong></td>
<td><strong>165,816</strong></td>
<td><strong>88.1</strong></td>
<td><strong>7.8</strong></td>
</tr>
<tr>
<td>Induced Effects</td>
<td>22,478</td>
<td>11.9</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Total Contribution</strong></td>
<td><strong>188,294</strong></td>
<td><strong>100.0</strong></td>
<td><strong>8.8</strong></td>
</tr>
</tbody>
</table>


Write equations to solve the following ratio and percentage problems. Show your work.

1. What is the ratio of jobs from indirect effects to jobs from direct contribution? Write the ratio as a fraction and reduce to the lowest common denominators.

2. What is the ratio of jobs from direct contribution + indirect effect to total number of jobs. Write the ratio as a fraction and reduce to the lowest common denominator.

3. If agriculture was responsible for 8.8 percent of total employment in our state in 2008, with 188,294 jobs, what was the total number of jobs in the state in 2008.

Oklahoma Ag in the Classroom is a program of the Oklahoma Cooperative Extension Service, the Oklahoma Department of Agriculture, Food and Forestry and the Oklahoma State Department of Education.
Healthy Hearts, Healthy Bodies

Your heart is a muscle about the size of your fist, located a little to the left of the middle of your chest. You have many muscles all over your body—in your arms, in your legs, in your back, even in your behind. But the heart muscle is special because of what it does. The heart sends blood around your body. The blood provides your body with the oxygen and nutrients it needs. It also carries away waste.

Your heart is like a pump, or two pumps in one. The right side of your heart receives blood from the body and pumps it to the lungs. The left side of the heart does the exact opposite: It receives blood from the lungs and pumps it out to the body.

How does the heart beat? Before each beat, your heart fills with blood. Then its muscle contracts to squirt the blood along. When the heart contracts, it squeezes. Try squeezing your hand into a fist. That is similar to what your heart does so it can squirt out the blood. Your heart does this all day and all night, all the time.

Most kids are born with a healthy heart, and it’s important to keep yours in good shape. Here are some things that you can do to help keep your heart happy:

- Remember that your heart is a muscle. If you want it to be strong, you need to exercise it. How do you do it? By being active in a way that gets you huffing and puffing, like jumping rope, dancing, or playing basketball. Try to be active every day for at least 30 minutes! An hour would be even better for your heart!
- Eat a variety of healthy foods and avoid foods high in unhealthy fats, such as saturated fats and trans fats (reading the labels on foods can help you figure out if your favorite snacks contain these unhealthy ingredients).
- Try to eat at least five servings of fruits and vegetables each day.
- Avoid sugary soft drinks and fruit drinks.
- Don’t smoke. It can damage the heart and blood vessels.

Conduct a taste test with heart-healthy foods like carrots, apples, whole wheat bread, and broccoli. Which one do you like best? Which do your classmates like best? Create graph to show which heart-healthy foods are class favorites.

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How to Make a Storyboard

Storyboarding, or picture writing, is the origin of all written languages, used by ancient cultures before text evolved. It is a natural bridge to text. The Chinese language was built using pictographs. Egyptians used storyboards, or hieroglyphics, first etched in stone and later written on papyrus, to organize a complex society and to rule the ancient world.

Look at any comic strip and you’ll see picture writing in action. A storyboard is a writing format, generally a set of boxes (or rectangles, circles, or other shapes) placed in a logically sequenced order. Each box or frame is a place for the writer to put information, pictures, symbols, or text.

Storyboards appear in many forms, from children’s books for new readers to emergency instructions on airplanes to technical textbooks. When writers in various fields want to make ideas easily understood, they choose a storyboard format or one of its close cousins: the flow chart, the timeline, or the PowerPoint presentation. Storyboards are widely used because we know pictures combined with text offer a rich synthesis of information that can entertain and inform. The pictures in picture writing can be simple cartoons, photographs, or sophisticated technical diagrams.

- Use the panels in your storyboard to make your points in order.
- Use simple drawings and a few key words in each panel.
- The storyboard is the visual equivalent of an outline of the main points. The pictures and text should support and reinforce each other. Together they should tell the whole story.

Look at the Egyptian hieroglyph below. Can you “read” the pictures to explain what is happening? Notice the order is from left to right.
The Magic of Agriculture
Storyboard Entry Form

1. The magic of agriculture starts with a seed.
2. You can decide on anything you want to grow like a strawberry.
3. First, you plant the seed and take good care of the plant.
4. Give the plant water and sunlight and let the seed grow... Harvest Time!
5. From a seed to a strawberry sundae, thanks to agriculture! Yum!