

Ag in My Community

Grades 3-5

Social Studies, Science



Objectives

Students will read and learn about agriculture in their own community and across the state. Students will identify agricultural commodities produced in their county, along with businesses that support agriculture and agritourism opportunities available in their area. Students will sample soil from the area and conduct experiments to identify soil types. Students will construct a simple rain gauge to measure rainfall and compare their results with official totals.

Vocabulary

agritourism— touring farming, ranching, or other agriculture businesses to be entertained or educated

commodity— a product or raw material that can be bought or sold

community— a group of people living in the same place or having common interests

cultural— the ideas, customs, and social behavior of a group

economic— relating to the production, distribution, and consumption of goods and services

environmental— relating to the natural world and the impact of human activity on its condition

Background

Agriculture has played an important role in Oklahoma's history and continues to contribute to the economy and culture of communities today. Many of the qualities people enjoy about country living result directly from farming, including open space, beautiful views and the rural way of life. Agriculture's contributions to **communities** include environmental, economic, and cultural benefits.

Farms vary widely in appearance and size, depending upon the type of plant or animal **commodity** produced. Some, such as dairy and beef farms need a lot of land to grow feed for the cattle. Farms that specialize in field crops such as wheat, corn, soybeans, cotton, peanuts and hay, may have very large fields but no animals. Others, such as fruits and vegetables, poultry, and modern swine farms are much smaller because they purchase feed and other supplies needed for production. Farms may look different, but all produce food, plants, or fiber. All farms play a variety of roles in the local community.

In addition to producing food and fiber, some farms also bring in people from other communities and school groups for seasonal activities. They form the basis for community events like the Peach Festival in Stratford, the Strawberry Festival in Stillwell and the Corn Maze at Hydro. In addition, there are many local pumpkin farms where children can choose their own pumpkin in the fall, a growing number of “pick your own” fruit and vegetable farms and even Christmas tree producers who contribute to local economies as individuals and families travel to experience of picking their own fruit, vegetables or cut their own Christmas Trees. These are all examples of **agritourism**.

Environmental Roles

Farms play an important **environmental** role in most Oklahoma communities. Much of the open space that community residents enjoy is owned by farmers and is kept open and pleasant to view because it is being farmed. Agricultural scenes, such as cows grazing in pasture, further contribute to rural beauty.

Ag in My Community (continued)

Farmland also provides important water benefits to the community. Farm fields provide the land area necessary for rainwater to percolate slowly through the soil, recharging the groundwater. Crop and pasture land reduces storm water and flood damage because less rainwater runs off into streams and other waterways.

In addition, farms help sustain the local ecosystem by providing important habitat for wildlife. The mix of fields, hedgerows, woods and wetlands on farms is particularly important for many species of animals and birds.

Economic Role

Agriculture plays an important **economic** role in many Oklahoma communities. Farms provide a source of income for people who farm full-time. They also supplement the household income of people who farm part-time while working full-time off the farm. They help sustain jobs in other parts of the agribusiness system as well. These include jobs at farm supply companies, which provide equipment, machinery, seed, and fertilizer; along with processing and distribution businesses, which take the raw materials from farmers and transport, process, package, and market them to consumers.

Farmland also provides a tax benefit to communities. Studies by the American Farmland Trust find that agricultural land provides more revenue to local governments and school districts than it requires back in services (like paving roads, building bridges, servicing utilities, etc.). Housing developments, in contrast, tends to require more in services than it returns in revenues. Agricultural land in a county or a school district helps keep residential property taxes lower than they would be otherwise.

Cultural Role

Farming plays a strong historical and **cultural** role in Oklahoma. Many communities owe their founding and existence to farmers who homesteaded and Native Americans who were relocated to Oklahoma during the Indian removals. Some African American slaves came to Oklahoma during the Indian removals and a larger group came after the Civil War and reconstruction as land in Indian Territory was made available for settlement. The migration of farmers from all cultures to Oklahoma brought those who provided services to farmers and their families, like trading posts, general stores and blacksmiths.

Additional Reading

Berry, Wendell, *The Unsettling of America: Culture and Agriculture*, Counterpoint Press, 2015

Castaldo, Nancy, *The Farm that Feeds Us: A year in the life of an organic farm*, Quarto Publishing, 2020

Gillespie Jr., Gilbert W., Hilchey, Duncan L., Kay, David L., Smith, R. David, *The Impact of Agriculture: It's More Than Economic (Part I)*, Rural New York Minute ISSUE NUMBER 16/APRIL 2008, Cornell University Community & Rural Development Institute (CaRDI)

Murphy, Cassandra, Melstrom, Richard, Shideler, Dave, Cummings, Jamie, *Agritourism in Oklahoma*, Oklahoma Cooperative Extension Fact Sheet, 2015

Websites

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Oklahoma/index.php

<https://nie.newsok.com/wp-content/uploads/Native-Farming-and-Ag-Student-Workbook.pdf>

<https://www.okhistory.org/publications/enc/entry.php?entry=FA019>

REV 11/2020

Ag in My Community

Activity 1

Grades 3-5 Teacher Resources and Standards

Activity 1: Ag in My Community, (Social Studies, Science) 2-3 50 minute class periods

Students will identify agricultural commodities produced in their county, along with businesses that support agriculture and agritourism opportunities available in their area.

Oklahoma Academic Standards

Activity 1: Ag in My Community (Social Studies, Science)

- 3.2.1SS Examine Oklahoma's political and physical features
- 3.2.2SS Examine the interaction of the environment and the peoples of Oklahoma.
- 3.4.1SS Compare differences among human, natural, and capital resources used to produce goods and services.
- 4.4.1SS Analyze how humans adapt to and modify their environments in order to survive and grow.
- 4.4.3SS Explain how economic activities can threaten the physical environment.
- 4.ESS2.2 Analyze and interpret data from maps to describe patterns of Earth's features.

Materials:

- **Oklahoma Agricultural Commodities Chart**
- Activity 1 Reading Page 1 "What is Agritourism?"
- Activity 1 Worksheet 1 "Oklahoma Counties"
- Activity 1 Worksheet 2 "Oklahoma Agriculture Scavenger Hunt"
- Activity 1 Worksheet 3 "Ag in My County"
- samples of agricultural products from your county (see charts) or the products made from them
- magazines with pictures of agricultural commodities and products made from them
- scissors
- glue
- paper for making books
- Oklahoma road maps and Agritourism maps (available free from the Oklahoma Department of Tourism, <https://www.travelok.com/brochures>, 1-800-652-6552)

Procedures

1. Lead a discussion about your county and state based on the following questions:
 - Do you live in a city? Small town? Farm town? Large town? Suburb?
 - Which of these categories best describes your community: desert, grassland, mountainous, forested?
 - How is your community different from the rest of Oklahoma?
 - How is your community similar to the rest of Oklahoma?

Ag in My Community

Activity 1

Grades 3-5 Teacher Resources and Standards

Continued procedures:

2. Students will list crops and livestock grown in your county. Write all answers on the chalkboard.
 - Discuss the conditions in your community that make it possible for the commodities listed to be grown. (rainfall, irrigation, fertile soil, temperatures, length of growing season, transportation to markets)
 - Hand out Worksheet 1 “**Oklahoma Counties.**” Have students find your county on map and color lightly
 - Hand out copies of the **Oklahoma Agricultural Commodities Charts** included with this lesson. The charts provide county lists of agricultural commodities reported in the last Census of Agriculture. Discuss your county’s list. Compare the chart with the list they made earlier. Ask students if they are surprised at the diversity of agriculture in your county.
 - Using Worksheet 1, locate the counties one each side of your county. Using the Commodities Charts, compare their Agricultural Commodities with yours. Now look at two counties far away from your county and compare.
 - Provide samples of some of the commodities or products produced in your county for students to handle (e.g., stalks of wheat, corn, wool from sheep, leather from cattle, etc.)
3. Provide copies of Worksheet 2 “**Oklahoma Agriculture Scavenger Hunt.**”
 - Students will work individually or in groups to find the answers using the Oklahoma Agricultural Commodities charts you have provided.
 - Students will work in groups to develop their own questions based on the charts and exchange the sets of questions with other groups.
4. Hand out Worksheet 3 “**Ag in My County.**”
 - Print a copy of your county’s profile from the Census of Agriculture website:
https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Oklahoma/index.php
 - Students will work in groups using the county profile along with the business listings in the phone book and internet resources to locate Agritourism opportunities and businesses that serve agriculture to complete worksheet 3
 - Consider inviting someone from one of the Agriculture related businesses to speak to the class about the importance of their particular commodity to the community/county.
5. Fold and staple paper to make blank books. On the front write “Ag in My Community.” Students will illustrate the booklet with drawings, pictures cut from magazines, samples of the actual products, or written descriptions and interesting facts. (See Agricultural Facts in the “Resources” section of the AITC website https://ok.agclassroom.org/resources_facts/agfacts/)
6. Students will use data from the most recent agricultural census to find the economic value of the top agricultural commodities
https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1_Chapter_2_County_Level/
7. Students will find the following on a map of Oklahoma:
 - Your town and county.
 - The county seat of your county.
 - The interstate highways, rivers and railways nearest your town.
 - Is your county in the northeast, southwest, northwest, southeast, south central or north central part of Oklahoma?
 - What county is to your south? East? North? West?

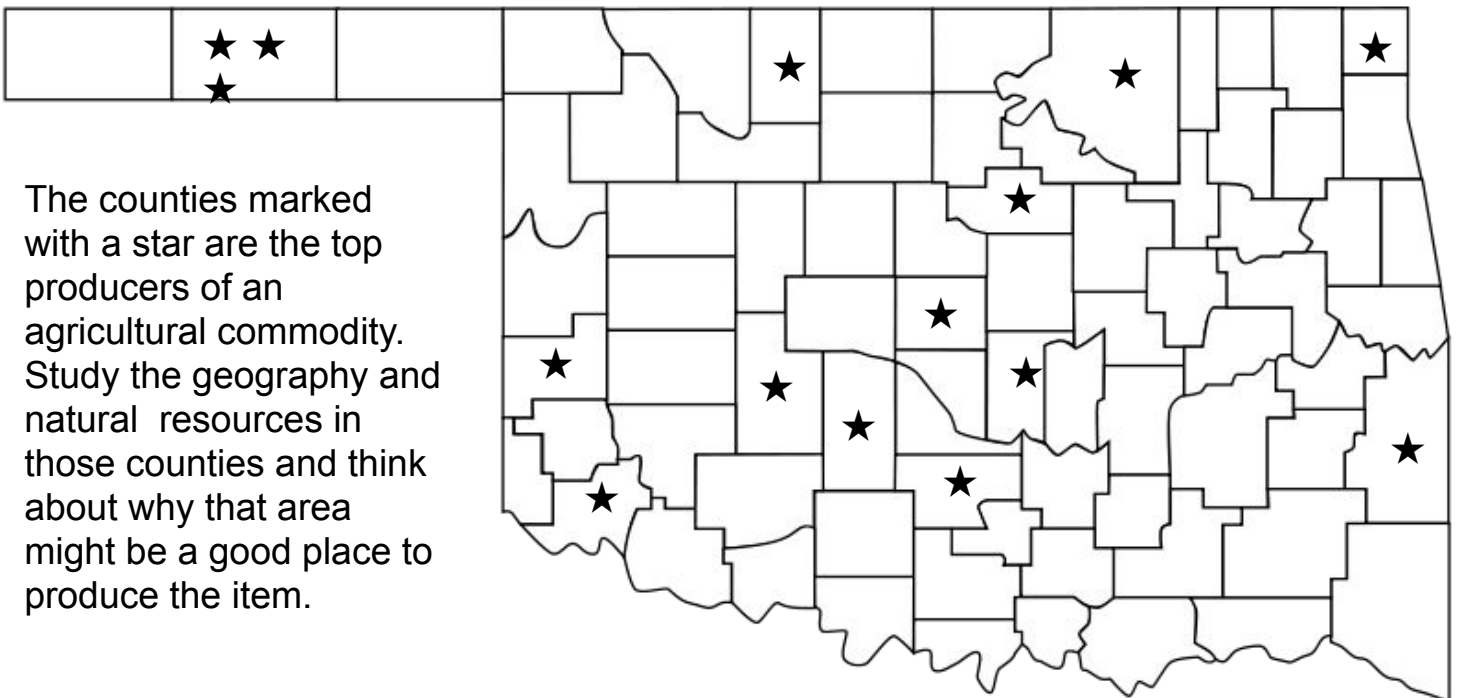
The National Agricultural Statistics Service (NASS) conducts a nationwide Census of Agriculture every five years. The last ag census was taken in 2017. Use the lists below to find out what agricultural commodities are produced in your county by acreage and by livestock inventory. A star indicates the county with the highest acreage or inventory in the state for that commodity. For more detailed information about agriculture in your county, go to this link and click on your county:

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Oklahoma/index.php

	Grains, oilseeds, dry beans, dry peas	Cotton and cottonseed	Vegetables, melons, potatoes, sweet potatoes	Fruits, tree nuts, berries	Nursery, greenhouse, floriculture, sod	Christmas trees, sort rotation, woody crops	Other crops and hay	Poultry and eggs	Cattle and calves	Milk from cows	Hogs and pigs	Sheep, goats, wool, mohair, milk	Horses, ponies, mules, burros, donkeys	Aquaculture	Other animals and animal products
Adair	X		X	X	X		X	X	X	X	X	X	X		X
Alfalfa	X	X		X			X	X	X	X	X	X	X	★	X
Atoka	X		X	X	X		X	X	X	X	X	X	X		X
Beaver	X	X					X	X	X		X	X	X	X	X
Beckham	X	X	★	X	X		X	X	X		X	X	X		X
Blaine	X	X	X	X			X	X	X	X	X	X	X		X
Bryan	X		X	X	X		X	X	X	X	X	X	X	X	X
Caddo	X	X	X	X	X		★	X	X	X	X	X	X		X
Canadian	X	X	X	X	X	X	X	X	X	X	X	X	X		X
Carter	X		X	X	X		X	X	X		X	X	X		X
Cherokee	X		X	X	X	X	X	X	X	X	X	X	X	X	X
Choctaw	X		X	X	X		X	X	X	X	X	X	X		X
Cimarron	X	X	X				X	X	X	X	X	X	X		
Cleveland	X		X	X	X	X	X	X	X	X	X	X	X		X
Coal	X		X	X	X		X	X	X	X	X	X	X		X
Comanche	X	X	X	X	X		X	X	X	X	X	X	X		X
Cotton	X	X		X	X		X	X	X		X	X	X		X
Craig	X		X	X	X		X	X	X	X	X	X	X		X
Creek	X		X	X	X		X	X	X	X	X	X	X		X
Custer	X	X	X		X		X	X	X	X	X	X	X		X
Delaware	X	X	X	X	X		X	X	X	X	X	X	X		X
Dewey	X						X	X	X		X	X	X		
Ellis	X	X					X	X	X	X	X	X	X		X
Garfield	X	X	X	X	X		X	X	X	X	X	X	X		X
Garvin	X		X	★	X		X	X	X	X	X	X	X		X
Grady	X	X	X	X	X	X	X	X	X	★	X	X	X		X
Grant	X	X					X	X	X		X	X	X		X
Greer	X	X					X	X	X	X	X	X	X		X

	Grains, oilseeds, dry beans, dry peas	Cotton and cottonseed	Vegetables, melons, potatoes, sweet potatoes	Fruits, tree nuts, berries	Nursery, greenhouse, floriculture, sod	Christmas trees, sort rotation woody crops	Other crops and hay	Poultry and eggs	Cattle and calves	Milk from cows	Hogs and pigs	Sheep, goats, wool, mohair, milk	Horses, ponies, mules, burros, donkeys	Aquaculture	Other animals and animal products
Harmon	X	X					X	X	X		X	X	X		
Harper	X						X	X	X		X	X	X		X
Haskell	X		X	X			X	X	X		X	X	X		X
Hughes	X		X	X	X		X	X	X		X	X	X		X
Jackson	X	★		X	X		X	X	X	X	X	X	X		X
Jefferson	X		X	X			X		X	X	X	X	X		X
Johnston	X		X	X	X		X	X	X		X	X	X	X	X
Kay	X	X	X	X	X		X	X	X	X	X	X	X		X
Kingfisher	X	X	X	X	X		X	X	X	X	X	X	X		X
Kiowa	X	X		X	X		X	X	X		X	X	X		X
Latimer	X		X	X			X	X	X		X	X	X		X
Leflore	X		X	X	X		X	★	X	X	X	X	X		X
Lincoln	X	X	X	X	X		X	X	X		X	X	X		X
Logan	X		X	X	X		X	X	X	X	X	X	X	X	X
Love	X		X	X	X		X	X	X	X	X	X	X	X	X
McClain	X	X	X	X	X		X	X	X	X	X	X	X		X
McCurtain	X	X	X	X			X	X	X	X	X	X	X		X
McIntosh	X		X	X			X	X	X		X	X	X	X	X
Major	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Marshall	X		X	X	X		X	X	X		X	X	X		X
Mayer	X		X	X	X		X	X	X	X	X	X	X	X	X
Murray	X		X	X	X		X	X	X	X	X	X	X	X	X
Muskogee	X		X	X	X	X	X	X	X		X	X	X		X
Noble	X		X	X	X		X	X	X		X	X	X		X
Nowata	X		X	X	X		X	X	X	X	X	X	X		X
Okfuskee	X		X	X	X		X	X	X		X	X	X		X
Oklahoma	X	X	X	X	X	★	X	X	X	X	X	X	X		X
Okmulgee	X		X	X	X	X	X	X	X	X	X	X	X		X
Osage	X		X	X	X		X	X	X		X	X	X		★
Ottawa	X		X	X	★		X	X	X	X	X	X	X	X	X
Pawnee	X		X	X			X	X	X	X	X	X	X		X
Payne	X		X	X	X		X	X	X	X	X	★			X
Pittsburg	X		X	X	X		X	X	X	X	X	X	X	X	X
Pontotoc	X		X	X	X		X	X	X	X	X	X	X		X
Pottawatomie	X		X	X	X	X	X	X	X	X	X	★	X		X
Pushmataha			X	X			X	X	X		X	X	X		X

	Grains, oilseeds, dry beans, dry peas	Cotton and cottonseed	Vegetables, melons, potatoes, sweet potatoes	Fruits, tree nuts, berries	Nursery, greenhouse, floriculture, sod	Christmas trees, sort rotation woody crops	Other crops and hay	Poultry and eggs	Cattle and calves	Milk from cows	Hogs and pigs	Sheep, goats, wool, mohair, milk	Horses, ponies, mules, burros, donkeys	Aquaculture	Other animals and animal products
Roger Mills	X	X					X	X	X	X	X	X	X		X
Rogers	X		X	X	X		X	X	X	X	X	X	X	X	X
Seminole	X		X	X	X		X	X	X	X	X	X	X	X	X
Sequoyah	X		X	X	X	X	X	X	X		X	X	X	X	X
Stephens	X		X	X	X		X	X	X	X	X	X	X	X	X
Texas	★	X	X	X	X		X	X	★		★	X	X	X	X
Tillman	X	X			X		X	X	X	X	X	X	X		X
Tulsa	X		X	X	X	X	X	X	X	X	X	X	X		X
Wagoner	X		X	X	X		X	X	X	X	X	X	X		X
Washington	X			X	X		X	X	X	X	X	X	X		X
Washita	X	X	X	X	X		X	X	X		X	X	X		X
Woods	X						X	X	X		X	X	X		
Woodward	X	X	X	X			X	X	X		X	X	X		X
Counties Producing Commodity	76	32	61	66	56	10	77	76	77	48	77	77	77	20	73



The counties marked with a star are the top producers of an agricultural commodity. Study the geography and natural resources in those counties and think about why that area might be a good place to produce the item.

Ag in My Community

Activity 1 Worksheet 1: Oklahoma Counties

Name: _____

Date: _____



Ag in My Community

Activity 1 Worksheet 2: Oklahoma Agriculture Scavenger Hunt



Name: _____ Date: _____

Use the “Ag in My Community” county charts to find the answers to the following questions. Use a map of Oklahoma to help answer any location questions. The agricultural commodities in bold print indicate the county with the highest acreage or inventory in the state for that commodity.

1. Find five counties where fruit, tree nuts (like pecans) or berries were grown.

2. Find a county where aquaculture is listed as an agricultural commodity.

3. Find five counties where sheep and lambs were listed as agricultural commodities.

4. List five counties where cotton and cottonseed are listed as agricultural commodities?

5. Find the county with the highest inventory of horses, ponies, mules, burrows and donkeys.

6. Find a county where you could buy a locally grown Christmas Tree.

7. Find the county with the highest acreage of vegetables, melons, potatoes and sweet potatoes.

8. How many counties do not have grains, oilseeds, dry beans or dry peas listed as a commodity? Circle the county which had the highest acreage.

9. Name two agricultural commodities produced in every county in Oklahoma?

10. One county has the highest inventory of three different agricultural commodities. Name the county and the commodities.

11. Develop a map symbol for each of the commodities mentioned in the scavenger hunt questions. Then draw the symbol in the correct county on the county map included with this lesson. Draw a map legend in the map's margins using your symbols.

Fruit:

Aquaculture:

Pecans:

Sheep:

Berries:

Cotton:

Horses:

Mules/Donkeys:

Christmas Trees:

Potatoes:

Melons:

Vegetables:

Grains:

Beans:

Cattle:

Pigs:

12. Do you notice any patterns about the counties which have some of the less common crops?

Ag in My Community

Activity 1 Worksheet 2: Oklahoma Agriculture Scavenger Hunt



ANSWER KEY

Name: _____ Date: _____

In the “Ag in My Community” county charts, the agricultural commodities in bold print indicate the county with the highest acreage or inventory in the state for that commodity. Use the charts to find the answers to the following questions. Use a map of Oklahoma to help answer any location questions.

1. Find five counties where fruit, tree nuts (like pecans) or berries are grown.
All BUT Beaver, Cimarron, Dewey, Ellis, Grant, Greer, Harmon, Harper, Roger Mills, Tillman, Woods
2. Find a county where aquaculture is listed as an agricultural commodity.
Counties include: Alfalfa, Beaver, Bryan, Cherokee Johnston, Logan, Love, McIntosh, Major, Mayes, Murray, Ottawa, Pittsburg, Rogers, Seminole, Sequoyah, Stephens, Texas
3. Find five counties where sheep and lambs were listed as agricultural commodities.
All counties produce sheep and lambs
4. List five counties where Cotton and cottonseed are listed as agricultural commodities?
Alfalfa, Beaver, Beckham, Blaine, Caddo, Canadian, Cimarron, Comanche, Cotton, Custer, Delaware, Ellis, Garfield, Grady, Grant, Greer, Harmon, Jackson, Kay, Kingfisher, Kiowa, Lincoln, McClain, McCurtain, Major, Oklahoma, Roger Mills, Texas, Tillman, Washita, Woodward
5. Find the county with the highest inventory of horses, ponies, mules, burrows and donkeys.
Payne
6. Find a county where you could buy a locally grown Christmas Tree.
Canadian, Cherokee, Cleveland, Grady, Muskogee, Oklahoma, Okmulgee, Pottawatomie, Sequoyah, Tulsa
7. Find the county with the highest acreage of vegetables, melons, potatoes and sweet potatoes.
Beckham
8. How many counties do not have grains, oilseeds, dry beans or dry peas listed as a commodity? Which county had the highest acreage?
Only one county does not list grain as a commodity; Texas county has the highest acreage
9. Name two agricultural commodities produced in every county in Oklahoma.
ANSWERS MAY VARY, but can be either: Cattle and calves; Hogs and pigs; Sheep, goats, wool, mohair and milk; Horses, ponies, mules, burros and donkeys
10. One county has the highest inventory of three different agricultural commodities. Name the county and the commodities.
Texas County leads in Grain, oilseeds, dry bean/peas; Cattle and calves; Hogs and pigs

Have you ever been to a farm? Did you pick your own pumpkin? Have you been to a Christmas tree farm? If you have, then you have been a part of agritourism. Agritourism is a fancy way to say you have toured a farm, ranch, or other agriculture store. It can be a lot of fun to visit one of these places! The owners want guests to learn about agriculture. Agriculture is another word for farming.

You and your family might want to stay in the country. There are many places where guests can stay. These places are much like a hotel. While staying, you may be able to fish or hike. Other places allow guests to hunt. Many places let you ride a horse on a trail ride.

There are many places which sell items to people. You can buy the items when you visit the farm. These places might not be open all year. They might only be open when their product is ready to sell. Some of these places are called U-pick farms. Here you pick your own fruits or vegetables. Some places sell pumpkins. Others sell Christmas trees. There are also farms where you can buy plants. Some farms sell trees. Some farms even sell flowers. There are stores where you can buy locally grown honey. You can also buy jam or jelly. Some stores sell fresh pickles. Others sell cheese or beef jerky. There are places where they make and sell soap or candles. There are even stores with hand-made clothing and quilts.



There are also places where you can enjoy the outdoors. You might learn about life on the farm. You can also learn about the history of farming. You might enjoy a trail ride or a hay ride. In the fall you can go to a corn maze. Some places offer farm tours. There are also farm museums. You can go to a petting zoo to see farm animals. Some places even have exotic farm animals! There are even horse showing and agriculture camps for youth.



In Oklahoma, you can visit farms to learn about honeybees. You can also visit a vineyard. A vineyard is a place where grapes are grown. In Oklahoma, there are more than 350 agritourism places to visit. Almost every county in Oklahoma has at least one place to visit. Most counties have many places to visit. In Oklahoma, your agritourism adventure awaits!

Ag in My Community

Activity 1 Worksheet 3: Ag in My County



Name: _____ Date: _____

Use the websites below to find information about your county to complete this worksheet.

Draw or write your answers.

- https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Oklahoma/index.php
- <http://www.oklahomaagritourism.com/>

Top Ag Commodities

Farm Statistics

of farms _____

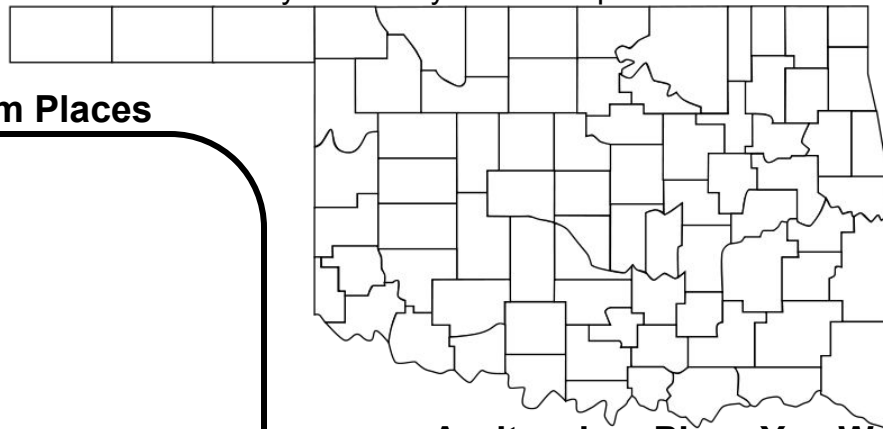
Average farm size _____ acres

Highest ranked crop:

Highest ranked animal product:

My County

Color your county on the map below



Agritourism Places

Agritourism Place You Want to Visit

Ag in My Community

Activity 1 Worksheet 3: Ag in My County



Name: _____ Date: _____

Use the websites below to find information about your county to complete this worksheet.

Draw or write your answers.

- https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Oklahoma/index.php
- <http://www.oklahomaagritourism.com/>

Top Ag Commodities

On page 2 of the county profile, the top crops are listed in the lower right hand corner, along with a livestock inventory.

Farm Statistics

of farms _____

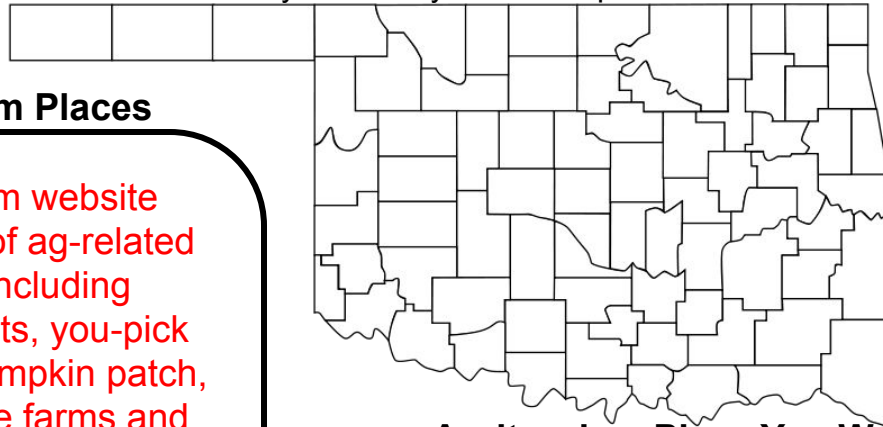
Average farm size _____ acres

Highest ranked crop:

Highest ranked animal product:

My County

Color your county on the map below



Agritourism Places

The Agritourism website lists a variety of ag-related opportunities including farmers markets, you-pick operations, pumpkin patch, Christmas Tree farms and other businesses that bring visitors to your community. If your community is small, look for nearby opportunities. Clicking on the "Regions" tab, then find your county.

Agritourism Place You Want to Visit

Ag in My Community

Activity 2

Grades 3-5 Teacher Resources and Standards

Activity 2: My Natural Resources, (Science) 1-2 50 minute class periods

Students will sample soil from the area and conduct experiments to identify soil types. Students will construct a simple rain gauge to measure rainfall and compare their results with official totals.

Oklahoma Academic Standards

Activity 2: My Natural Resources (Science)

- 3.LS4.3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.
- 5.ESS3.1 Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environments

Materials:

- Activity 2 Worksheet 1 “**Sand, Silt or Clay**”
- Activity 2 Worksheet 2 “**Measuring Rainfall**”
- soil samples from your area
- quart jars with lids (one for each soil sample)
- magnifying glasses
- ph testing kits supplies
- plastic soda bottle (2 Liter heavy plastic is best)
- scissors
- ruler
- permanent marker
- pebbles or marbles and sand

Procedures

1. Students will gather soil samples from the school yard or from their own yards or fields. If your community has diversity in its terrain, try to get a sample near a river or stream, from a rocky hill, from a field used for annual crops like corn, cotton or wheat, from a wooded or “natural” area where soil is not disturbed and from a garden or flower bed.
 - Label each sample with the type of area it came from. If your school district has a large area, plot the samples on a map of the school district.
 - Examine the soils with a magnifying glass and sort them according to color.
 - Moisten a small sample of each soil to determine if they are clay (slippery) or sand (gritty).
 - Use soil testing kits (available from garden centers) to test ph levels in the soil samples.
 - Conduct the experiment on Worksheet 1 “**Sand, Silt or Clay**” to determine how much sand, silt and clay is in each soil sample.
2. Students will make rain gauges from plastic bottles as instructed in Worksheet 2 “**Measuring Rainfall**” and:
 - Track rainfall for the school year.
 - Graph rainfall month by month.
 - Compare school rainfall totals with official rainfall totals from Oklahoma Mesonet

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Activity 2 Worksheet 1: Sand, Silt or Clay



Name: _____ Date: _____

Soil is a mixture of sand, silt and clay. This activity will help you figure out how much of each substance is in your soil.

Farmers, gardeners, landscapers and homeowners test their soil before the growing season so they will know how much and what type of fertilizer to apply to help their crops, gardens or lawns grow. By knowing what nutrients are needed, individuals can apply only what is needed. For this experiment, our sampling method will be similar, but we will conduct our own tests.

How to take a soil sample:

1. Use a shovel, garden trowel or soil probe (can be borrowed from the OSU Extension Office) to get a sample that is at least 8-10 inches deep.
2. If using a shovel, make 3 cuts into the soil in the shape of a triangle and lift the sample out of the ground. You may see a color change or layers. If so, be sure to get some of the soil from each layer. You need enough soil to fill up a zip-top sandwich bag.
3. If using a soil probe, get samples from several different locations in the yard, garden, field or other area and mix them together.

Soil Texture Experiment



1. Fill a quart jar half full of soil
2. Wet the soil to a mud consistency and tap the jar to settle the soil.
3. Mark the level of soil on the jar with a permanent marker
4. Add water to the top of the jar and shake the soil water mix until the soil is all mixed up in the water
5. Put the jar on a table and let the soil settle out for 1 minute
6. Mark the level of soil that has settled on the jar. Sand is the heaviest part of the soil, so it settles first. Label this line "sand".
7. Set the jar(s) on a table and wait at least 6 and up to 24 hours and then mark the levels of the soil in the jar. You should be able to see 3 total layers of soil.

8. The difference between the bottom mark, which is the *sand*, and the second mark from the bottom of the jar is the *silt* portion of the soil.
9. The top layer (above the silt) is the *clay*.

Most soils in Oklahoma are a mixture of these three types:

- Sand - large coarse particles that help keep soil from packing together. Soil with too much sand dries out quickly.
- Silt - smaller particles that are usually found in areas that have flooded and dried out again (like near a creek or river that floods). Water moves more slowly through silt than sand and it holds water longer.
- Clay - very tiny particles that fit together so tightly that it is hard for water to flow through. Water tends to stand on the surface of clay soil and then become very hard when it dries out.



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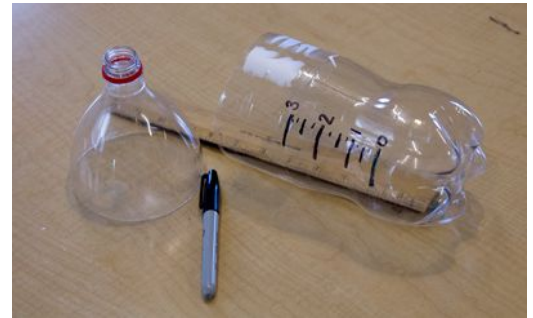
Activity 2 Worksheet 2: Measuring Rainfall



Name: _____ Date: _____

What You Need

- Water bottle (preferably 2L)
- Scissors
- Ruler
- Permanent Marker
- Pebbles or marbles and sand



What To Do

1. Cut the top section off a clear bottle as shown. Use a ruler to mark in $\frac{1}{4}$ inch measuring increments starting about 2" from the bottom of bottle.
2. Pour gravel or pebbles into the base of the bottle for weight. Then add sand up to the "0" line. This gives you a flat base to start measuring rainfall, as opposed to the lumpy bottom of a bottle
3. Add water until you can just see it at the top of the sand. This calibrates the gauge at "0".
4. Put the top inside the water bottle and upside down, to help funnel rain into the gauge.
5. Place the rain gauge on a flat surface outside away from trees or buildings and wait for the next rain.
6. Check the forecast. On a day that rain is in the forecast, check the water level to be sure it has not evaporated below the "0" line. Refill to that line if needed.



Check Your Gauge

Check the accuracy of your rain gauge by comparing your rainfall total with official sources. One good source is the Oklahoma Mesonet. There are Mesonet weather stations located in every county in Oklahoma. Go to the Mesonet website <http://www.mesonet.org/index.php/weather/local/> and enter your city or zip code in the search box to find the closest Mesonet station. Once you select a location the site will display weather for that station. In addition to rainfall, you can check other things like soil temperature and soil moisture which are important to Oklahoma agriculture.

