Oh, Christmas Tree!

Objective
Students will read about Christmas tree farming and early Christmas tree customs. Students will develop timelines based on the reading about the history of Christmas trees. Students will write narratives about their own family holiday customs. Students will complete array and/or pre-algebra problems based on Christmas tree farming. Students will construct a Christmas tree and label its parts. Students will locate Oklahoma Christmas tree farms on a map of Oklahoma.

Background
Oklahoma has approximately 30 Christmas tree farms. Most of them are classified as “choose-and-cut” operations. That means customers select trees directly from the farm and either cut them themselves or have someone cut it for them. Trees purchased from “choose and cut” lots are fresher than those bought from lots or stores, so they last longer.

Management of a Christmas tree farm includes weed control, insect and disease control, and tree shaping. It can take 5 or 6 years to grow a tree to the preferred height of 6-8 feet.

Although Christmas trees can be grown on a variety of sites, the better the site the more efficient the operation and the faster the production of marketable trees. Location in relation to the market is also important. The closer a farm to a large population area, the more successful the farm will be.

Level to rolling land is best suited for Christmas tree production since it will most easily accommodate equipment used for site preparation, planting, and weed control. The site should be protected from the wind, since our Oklahoma wind can deform, break, or dry out trees. The ideal soil is a deep, slightly acidic, loamy soil with good drainage.

The species best suited for Oklahoma conditions are Virginia pine, Scotch pine and Austrian pine. Eastern red cedar grows naturally in Oklahoma, and some people harvest field-grown trees for use as Christmas trees.

Bare root seedlings are planted December to March. Seedlings are planted in straight rows. A spacing of six by six is usually the closest for a tree that will grow to an average height of six feet. This spacing allows 1,200 trees per acre. Some growers start new trees in partially harvested fields each year.

It is estimated that only 50 percent of the trees planted ever make it to market, mostly because of improper handling and storage of seedlings and improper planting techniques.

Trees do not grow into the conical shape of a Christmas tree without help. Shearing or “shaping” is one of the most time-consuming parts of the production process. Shearing helps create a single main stem, balanced symmetrical form, full and compact foliage and proper taper.

www.agclassroom.org/ok
These are all considered in the USDA grading system. A green colorant is used on some species, such as Virginia pine, which tends to turn yellow during the winter months.

The three basic ways Christmas trees are sold include choose and cut, retail and wholesale. Choose and cut is the most popular technique among Oklahoma growers. This requires planting near a populated area so the buyer can travel to the farm to select a tree. The tree is then cut down and prepared so the customer can transport it home fresh. Under the choose and cut method, trees not sold can be left to grow another season.

In the US, approximately 25-30 million real Christmas trees are sold each year. Almost all of these come from Christmas tree farms or plantations. Among the important Christmas tree-producing areas in the US are Wisconsin, North Carolina, Pennsylvania and the Pacific Northwest. The most common types of trees grown are fir, pine, spruce, and cypress.


Materials needed
- natural materials for constructing a model of a Christmas tree—sticks, leaves, twine, etc.
- newspaper
- paper towels
- flour
- water
- feathers
- medium-sized bowls
- straight or safety pins
- green plastic cups

English Language Arts
1. Ask students to name a few things that farmers produce. Students will raise their hands and name a few items. Once students are actively thinking about what farmers produce, tell them they are going to play a guessing game. Tell students that in some places farmers use helicopters to harvest their products. What is it? Offer the following clues.
   - It is harvested once a year.
   - It is not a food crop.
   - It is not produced by animals.
   - It takes 4-15 years to grow.
   - It has needles instead of leaves. (It’s leaves are called needles.)
   - It is primarily green and cone-shaped.
   - It is most associated with the Christmas holiday.
2. Read and discuss background and vocabulary about the production of Christmas trees in Oklahoma.
3. Provide students with copies of the Reading Page about the history of Christmas trees.

www.agclassroom.org/ok
—Students will develop timelines of the history of the Christmas tree, based on the reading.
—Students will answer the following questions about the reading individually or in group discussion:
  • What is the central idea of the reading? What are the supporting details?
  • What was most responsible for spreading the popularity of Christmas trees? (newspapers and women’s magazines like *Ladies Home Journal* and *Godey’s Lady’s Book*)
  • Artificial Christmas trees became popular in the US after what? (advertisement in Sears Roebuck catalog)
4. Students will write reflective papers about family traditions associated with winter holidays, including special holiday foods. Writing Prompt: “It wouldn’t be the holidays at my house without__________.”
5. Students will share family holiday recipes and develop a holiday cookbook.
6. Invite a Christmas tree farmer to your class to talk to students about his/her operation.
   —Students will write questions and submit them to you ahead of time.
   —Students will write reports about the visit.
7. Some people like to use real trees at Christmas time and some people like to use artificial trees. Some argue that real trees are better for the environment, while others argue the opposite.
   —Divide the class into two sides—”Real” and “Artificial.”
   —Students will use online or library resources to research and argue for his/her side. Topics for consideration should include the time it takes to grow a real tree and/or the amount of resources needed to manufacture an artificial tree, impact on the local economy, etc. Students will use a variety of credible sources and prepare a bibliography to cite their sources. Students will present their research to the class.

Math
1. Hand out copies of the math work sheets included with this lesson. Students will complete the worksheets.
2. Conduct a classroom poll to determine what, if any, kind of tree is used in the winter celebrations. Prepare a classroom bar graph with a column for real trees, a column for artificial trees, a column for no trees and a column for other.
   —Students will conduct a schoolwide poll to find which kind of tree is most popular.
   —Students will draw bar graphs to represent the data they have collected.

Science
1. Students will work in groups or individually to build Christmas trees from green plastic cups.
   —Students will decide as a class how many cups each group should get.
   —The activity may be timed challenge.

Vocabulary (Cont.)
*polyvinyl chloride* (PVC) — the third-most widely produced polymer, after polyethylene and polypropylene. PVC comes in two basic forms: rigid and flexible.
*Sears Roebuck* — an American multinational department store chain headquartered in Illinois, known historically for its catalogue which offered a wide variety of products to rural customers beginning in 1888
*shear* — to cut branches to shape a tree or bush
*solstice* — the point in the apparent path of the sun at which the sun is farthest north or south of the equator
*subject* — a person who is under the rule of royalty
*symmetrical* — close agreement in size, shape, and relative position of parts on opposite sides of a dividing line or plane or around a central point
*synthetic* — produced artificially
*taper* — a gradual decrease
*tradition* — a continuing pattern of culture beliefs or practices
*visca* — an artificial straw made by spinning viscose in a flat filament capable of being braided, woven, or knitted and used especially for women’s hats
Ag Career: Christmas Tree Farmer

**JOB DESCRIPTION:** Christmas tree farmers take charge of all aspects of production, beginning with the planting of their crop. Farmers use farm machinery and supplies such as fertilizer to maximize the output of their product. After the crop grows to readiness, they harvest what they sow in preparation for sale. Farmers undertake a variety of business duties to ensure the economic viability of their enterprise. They keep a close eye on market conditions, monitor employees and deal with financial issues such as taxes and profitability.

**SKILLS:** The majority of a Christmas tree farmer’s work takes place outdoors during warm growing seasons but also takes place during periods of cold. Working with Christmas trees requires significant physical exertion when cutting, pruning, weeding, lifting and dragging trees. Because of the danger of working with heavy machinery and crops, workers must be alert while on the job. Farmers work long hours including weekend and holidays, especially when crop conditions demand extra attention.

**PREPARATION:** College courses in agricultural science and economics, agronomy, plant disease and farm management. Experience working with more experienced tree farmers.

---

At the end, students will determine which activity worked best and discuss why some didn’t work as well.

2. Students will work in groups and use online or library resources to research the differences between evergreen and deciduous trees.
—Students will make simple charts to compare and contrast the different kinds of trees.
—Students will display and describe their findings for the class.

3. Discuss the internal and external structures of a tree.
—Students will gather materials (stick for the trunk, leaves, twine for the roots, etc.) to construct Christmas trees with the following parts:

<table>
<thead>
<tr>
<th>part</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>taproot</td>
<td>shallow root</td>
</tr>
<tr>
<td>trunk</td>
<td>branch</td>
</tr>
<tr>
<td>bark</td>
<td>foliage</td>
</tr>
</tbody>
</table>

—Students will label the parts of the tree.
—After constructing and labeling their trees, students will research each part and write a paragraph for each part explaining its function. the role it plays in the survival and growth of the tree.

**Social Studies**

1. The following is a list of Christmas tree farms in Oklahoma, with their locations. On a road map of Oklahoma, students will locate the town and pin the location. Students will calculate the number of miles from each farm to your town. Which one is closest? Which one is farthest away? Is there one part of the state where more Christmas tree farms are located? Is the farm near a large population center? What is the population center?

Santa’s Forest Tree Farm, Ponca City
Four Daughters Tree Farm, Norman
Owasso Christmas Tree & Berry Farm, Owasso
Coffee Creek Christmas Tree Farm, Arcadia
Canadian Valley Tree Farm, Noble
Pleasant Valley Farms, Sand Springs, OK
Martinbird Tree Farm, Tuttle, OK
Red Barn Christmas Tree Farm, McAlester
JANDA Bend Christmas Trees, Stillwell
TG Farms, Newcastle, OK
Sorghum Mill Christmas Trees & Blackberry Farm, Edmond

**Visual Art**

1. The first artificial Christmas trees were feather trees. Students will make their own feather trees as follows.
—Ball and twist multiple sheets of newspaper into a 4- by 8-inch cone. Shape the cone so the base is flat and 4 inches wide.
—Wrap the entire cone in packing tape.

---

www.agclassroom.org/ok
Set the cone on its 4-inch base so the triangular point is aiming up.

Boil 2 cups water and 2 cups flour into a pot for three minutes to create a papier-mâché mix. Allow five minutes for the mix to cool. Pour the mix into a medium size bowl.

Rip paper towels into multiple 1-by-4-inch strips.

Dip one strip into the papier-mâché mix. Press the strip into the body of the cone. Continue until the entire cone is covered in two layers of paper towel. Allow three hours for the cone to dry.

Coat the cone in brown acrylic paint to emulate the look of a real tree trunk. Allow an additional two hours for the cone to dry.

Set multiple goose feathers nearby on a flat work surface. Purchase goose feathers at your local craft or feather supply store.

Poke horizontal rings of holes through the surface of the cone with a straight or safety pin. Move the pin in a circular motion to widen each hole. Continue until horizontal rings of holes extend all the way up the cone.

Stick goose feather stems through each hole. Adjust each feather so the underside is facing up — the curved side is facing down. Continue until the entire trunk is filled with feather-like leaves.

Extra Reading
Purcell, Ann, Christmas Tree Farm, Holiday House, 2006.
The practice of decorating an evergreen tree to brighten winter celebrations comes from many lands and cultures. Evergreen trees do not lose their needles in the fall. The needles drop off a little at a time. Although the trees remain green, they do not grow in winter. Plants that remain green in the winter remind us that spring will return, and once again the land will be lush and productive.

In the 8th Century, AD, a Christian monk named Boniface was in the land we now know as Germany, teaching the people about his religion. The natives worshipped a huge oak tree, which they decorated for the winter solstice. Since this practice was contrary to Christian teachings, Boniface cut down the tree. A fir tree grew in its place. Christian converts began to view the fir tree as God’s tree, and by the 12th century, fir trees could be seen displayed in homes during the winter months. The practice continued and spread throughout the land, becoming the Christmas tree we know today.

The German Prince Albert introduced the Christmas tree to England after his marriage to Queen Victoria in 1840. In 1846, the royal couple was shown in the Illustrated London News standing with their children around a Christmas tree. Victoria was very popular with her subjects, and what was done at court immediately became fashionable—not only in Britain, but with fashion-conscious East Coast Americans as well.

In the US, German immigrants who settled in Pennsylvania had community trees as early as 1747. Not until the mid-nineteenth century did Christmas trees start appearing in homes with no known German connection. President Franklin Pierce set up a “German tree” in the White House in 1856. Newspapers and women’s magazines like Ladies Home Journal and Godey’s Lady’s Book spread the Christmas tree custom to all ethnic groups and economic classes.

In 1851, a man named Mark Carr loaded cut trees from the Catskill Mountains onto two oxen-drawn sleds and carried them down to sell on the streets of New York City. This was the first known Christmas tree lot.

The first Christmas tree farm was started in 1901, when W.V. McGalliard planted 25,000 Norway spruce on his farm in New Jersey. He sold the trees seven years later for $1 each.

The first artificial Christmas trees were developed in Germany during the 19th century, in response to deforestation in that country. Artificial “trees” were made using goose feathers. Goose feathers were plentiful, and these feather trees provided an alternative to cutting live trees. Metal wire or sticks were covered with goose, turkey, ostrich or swan feathers. The feather sticks were drilled into a larger one to resemble the branches on a tree. The feathers were often dyed green to imitate pine needles.

The practice of using artificial trees did not take off in the US until Sears Roebuck first advertised artificial trees for sale in their 1913 catalogs. After World War II, in the 1950s, feather trees were replaced by artificial Christmas trees made of synthetic substances, like visca and aluminum. Most artificial trees today are made of polyvinyl chloride (PVC) and are manufactured in China.
Write mathematical expressions based on the following word problems. Solve the problems.

1. Farmer Green planted 9 rows of trees in 8 foot squares. Each row is 20 feet long. How many trees can he expect to have for sale in 5-6 years, when the trees are grown?

2. Farmer Green lost 1/4 of his trees to drought in the third year. How many trees did he have left? If all the remaining trees survive, how many will he have to sell in 5-6 years? If he charges $60 per tree for the trees that remain, how much will he earn per square foot?

3. In the following year Farmer Green planted another 7 rows of trees in 6-foot centers. Each row is 15 feet long. How many trees can he expect to have for sale in 5-6 years, when the trees are grown?

4. When trees reach chest high and above, shearing can take up to 20 hours or more per acre. If Farmer Green has 5 acres of trees planted, how long will it take him to shear all his trees. If he hires three helpers to do the shearing, how long will it take each of them, if they each shear an equal number of trees.
Oh, Christmas Tree: Arrays

Farmer Green planted Christmas trees in the array shown above. Fill in the blanks to make true statements.

1. 4 groups of 7 Christmas trees = _______________________  
   4 sevens = _______________  
   4 x 7 = _______________  

2. 7 + 7 + 7 + 7 = _______________________  
   4 groups of 7 = _______________  
   4 x 7 = _______________  

3. On a separate piece of paper, draw a Christmas tree lot to show 6 x 6 = 36

4. Draw a picture of Christmas trees to show 3 + 3 + 3 = 9. Then write a multiplication sentence to represent the picture.

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.