Oh, Christmas Tree

Grades 3-5

English Language Arts, Math, Science

Objectives

Students will sequence facts based on the history of Christmas trees. Students will compare evergreen and deciduous trees and construct a model of an evergreen tree and label its parts.

Vocabulary

evergreen—having leaves that stay green all year long
native—produced or existing naturally in a particular region
pagan—worship of many gods, goddesses, the earth or nature
solstice—one of the two times per year when the sun is the farthest north or south of the equator

Background

According to history, **evergreen** trees and boughs were an important part of winter celebrations for centuries. Ancient Egyptians, Vikings and Celts all used evergreen trees and wreaths to observe the Winter **Solstice** as early as the 8th century A.D.

Although the first written record of a decorated tree comes from Latvia in 1510, local historians agree that the merchants' guild decorated a tree (and then burned it) they do not believe the celebration was related to Christmas.

Historical records indicate that a Christmas tree was displayed in Strasbourg Cathedral in 1539. The practice became so popular that 15 years later one German city banned cutting trees for Christmas. As German families settled in other countries, the Christmas tree tradition went with them. German immigrants also brought the tradition to the North America. German settlements in Pennsylvania had community trees as early as 1747.

President Franklin Pierce set up a the first Christmas Tree in the White House in 1856. Newspapers and magazines spread Christmas tree customs throughout the country.

Until the mid-1800's, many Americans saw Christmas trees as **pagan** symbols. Governors and ministers spoke against the "heathen traditions of Christmas carols, decorated trees" and other non-religious celebrations of December 25th. People were fined for hanging decorations. German and Irish immigrants gradually overcame these restrictions and Christmas decorations became more common by the mid-1800's.

Although most families got their trees from neighboring forests until the mid 1900's, in 1851, Mark Carr cut trees in New York's Catskill Mountains, loaded them on two oxen-drawn sleds and sold them on the streets of New York City. This was the first known Christmas tree lot. In the following years, Christmas tree sales became big business. Trees came from as far away as Maine and were sold almost immediately.

The first Christmas tree farm in the United States was established in 1901. W.V McGalliard planted 25,000 Norway Spruce trees on his farm in New Jersey. Until that time, Christmas trees were **native** trees cut from nearby forests. He sold the trees seven years later for $1.00 per tree. Today there are Christmas tree farms in every U.S. state. One acre of Christmas trees can produce enough oxygen for 18 people.

In Europe and the United States, government leaders became concerned about the number of trees being cut for use as Christmas trees. There are legends that President Theodore Roosevelt was so concerned he tried to ban Christmas trees in the White House. Further research indicates that Roosevelt's family had never celebrated Christmas with a tree. There are accounts of the youngest children cutting down a tree on the White House grounds and decorating it as a surprise for the family.

Environmental concerns in the US and Europe created a demand for artificial Christmas trees. The first artificial trees in Europe were made with goose feathers that had been painted green and attached to wire branches. In the U.S., the first artificial tree was made in 1930 by the Addis Brush Company. Using the equipment that manufactured toilet brushes, they made the bristles green. The first aluminum trees were manufactured in Chicago in 1958. Today most artificial trees are made from PVC (polyvinyl chloride) and are manufactured in China and shipped to the U.S.

Today most Christmas trees are grown on dedicated, well managed Christmas tree farms. Across the U.S., 350,000 Christmas trees are grown on 15,000 farms. Deforestation is not longer a concern. About 93 percent of those who use "real" Christmas trees recycle their tree in community recycling programs, their garden or their backyard.

Additional Reading

Palmer, Robert W. and Donna L Palmer, *Ben and Molly's Christmas Tree Farm: A Christmas Tree Story*, Self-published, 2018

Purmell, Ann, *Christmas Tree Farm*, Holiday House, 2006.

Ray, Mary Lyn, *Christmas Farm*, Clarion, 2013

Winter, Jeanette, *The Christmas Tree Ship*, Guest Cottage, 2002.

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https://web.extension.illinois.edu/trees/facts.cfm
https://realchristmastrees.org/education/history-of-christmas-trees/
https://www.nationalgeographic.com/travel/article/christmas-tree-customs
https://www.christmastreeassociation.org/
http://www.dasnr.okstate.edu/Members/sean-hubbard-40okstate.edu/christmas-trees-in-oklahoma

REV:11/2021
2021 ELA Standards

Activity 1: All About Christmas Trees, (English Language Arts) 1-2 50 minute class periods

Students will learn the history of using evergreen trees to celebrate Christmas and other winter holidays, learn how artificial trees became popular and express opinions about real about real and artificial trees.

Oklahoma Academic Standards

Activity 1: All About Christmas Trees (English Language Arts)

3.2.R.3 4.2.R.3 5.2.R.3	Students will summarize and sequence the important events of a story.
3.4.R.5 4.4.R.5 5.4.R.5	Students will acquire new grade-level vocabulary, relate new words to prior knowledge, and apply vocabulary in various contexts.

Materials:

- Activity 1 Worksheet 1 **"Frayer Model"**
- Activity 1 Reading Page 1 **"History of Christmas Trees"**
- Activity 1 Worksheet 2 **"Christmas Tree Timeline"**

Procedures

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 history of Christmas trees.
   —Divide students into groups and assign each group one of the vocabulary words. Each group will complete Activity 1 Worksheet 1 **"Frayer Model"** for their assigned word.
3. Provide students with copies Activity 1 Reading Page 1 **"History of Christmas Trees"**.
   —Students will use Activity 1 Worksheet 2 **"Christmas Tree Timeline**" to sequence the history of the Christmas tree.

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Activity 1 Worksheet 1: Frayer Model

Name: _____ Date: _____

Definition	Facts or Characteristics
Examples	**Non-examples**

Name: _____ Date: _____

Evergreen trees are part of many winter holidays. They were used to celebrate the Winter Solstice as early as 700 A.D.

Several countries claim the first Christmas tree. Business owners decorated a tree in Latvia in the early 1500's. However, the tree was not related to Christmas. A decorated tree was displayed on Christmas in a German Cathedral in 1539. Historians believe it was the first Christmas tree.

German settlers brought the tradition of decorating trees to North America. The first community Christmas trees were seen in Pennsylvania in 1747.

The Puritans believed decorated trees should not be used. Governors and ministers did not approve of any non-religious celebrations of Christmas. People were punished for hanging decorations. Attitudes gradually changed. Christmas decorations became common by the mid-1800's.

Mark Carr cut and sold trees in New York City in 1851. This was the first Christmas tree lot. The first Christmas tree farm was planted in New Jersey. W.V McGalliard planted 25,000 Norway Spruce trees in 1901. This was the first Christmas tree farm. Today Christmas trees are grown in every state. Christmas trees are good for the environment. One acre of trees provide oxygen for 18 people.

Christmas trees became very popular. In the early 1900's, people worried about cutting too many trees. They wanted artificial trees. In Europe, the trees were made from goose feathers. The first trees In the U.S. were made in 1930 by Addis Brush Company. Shiny aluminum trees were first produced in 1958. Since 1980, most artificial trees have been made in China from a plastic called PVC (polyvinyl chloride).

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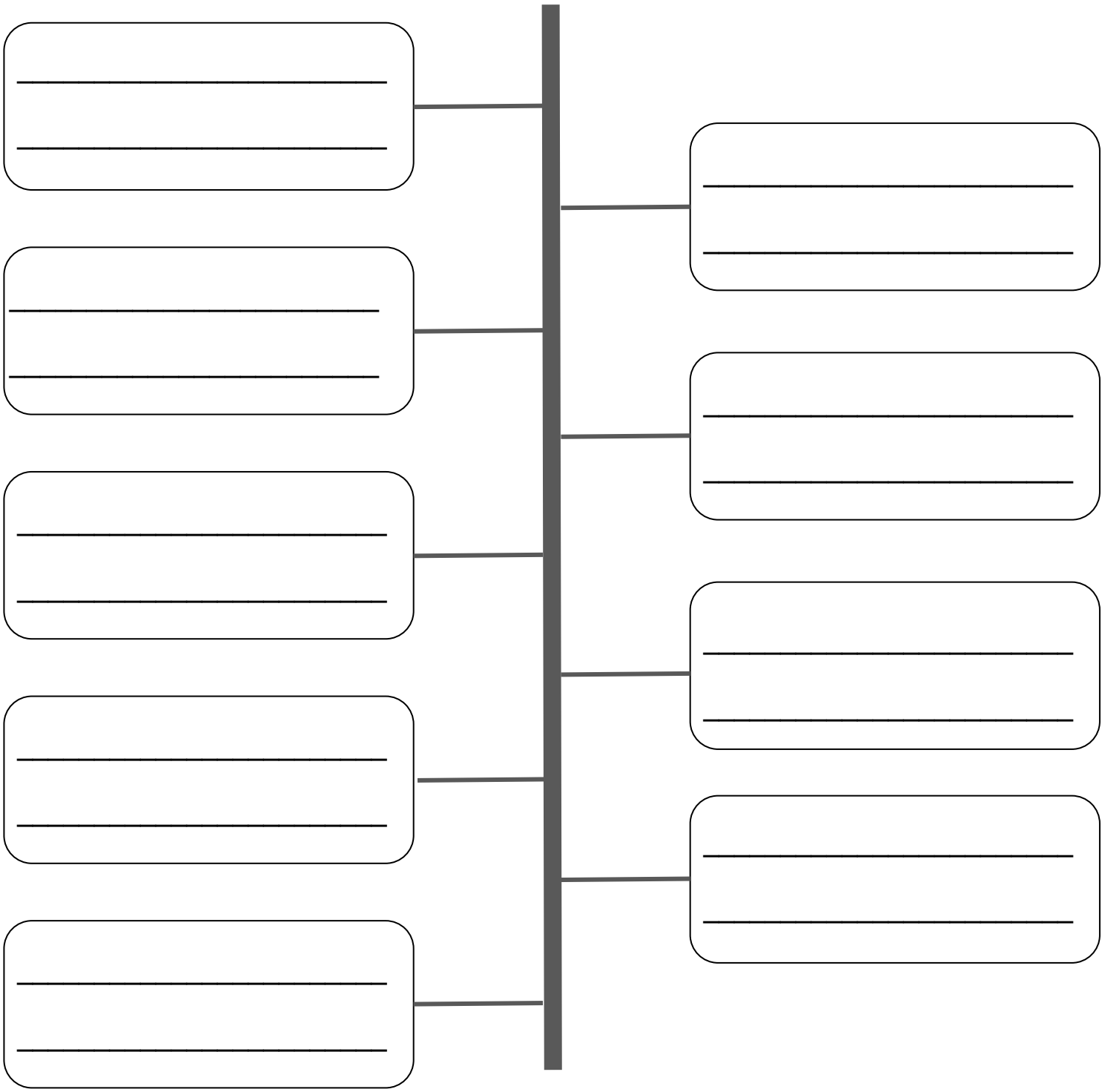
Activity 1 Worksheet 2: Christmas Tree Timeline

Name: _____ Date: _____

Write years from the **"History of Christmas Trees"** reading page on the short lines. Use the box beside the line to write what happened in that year.



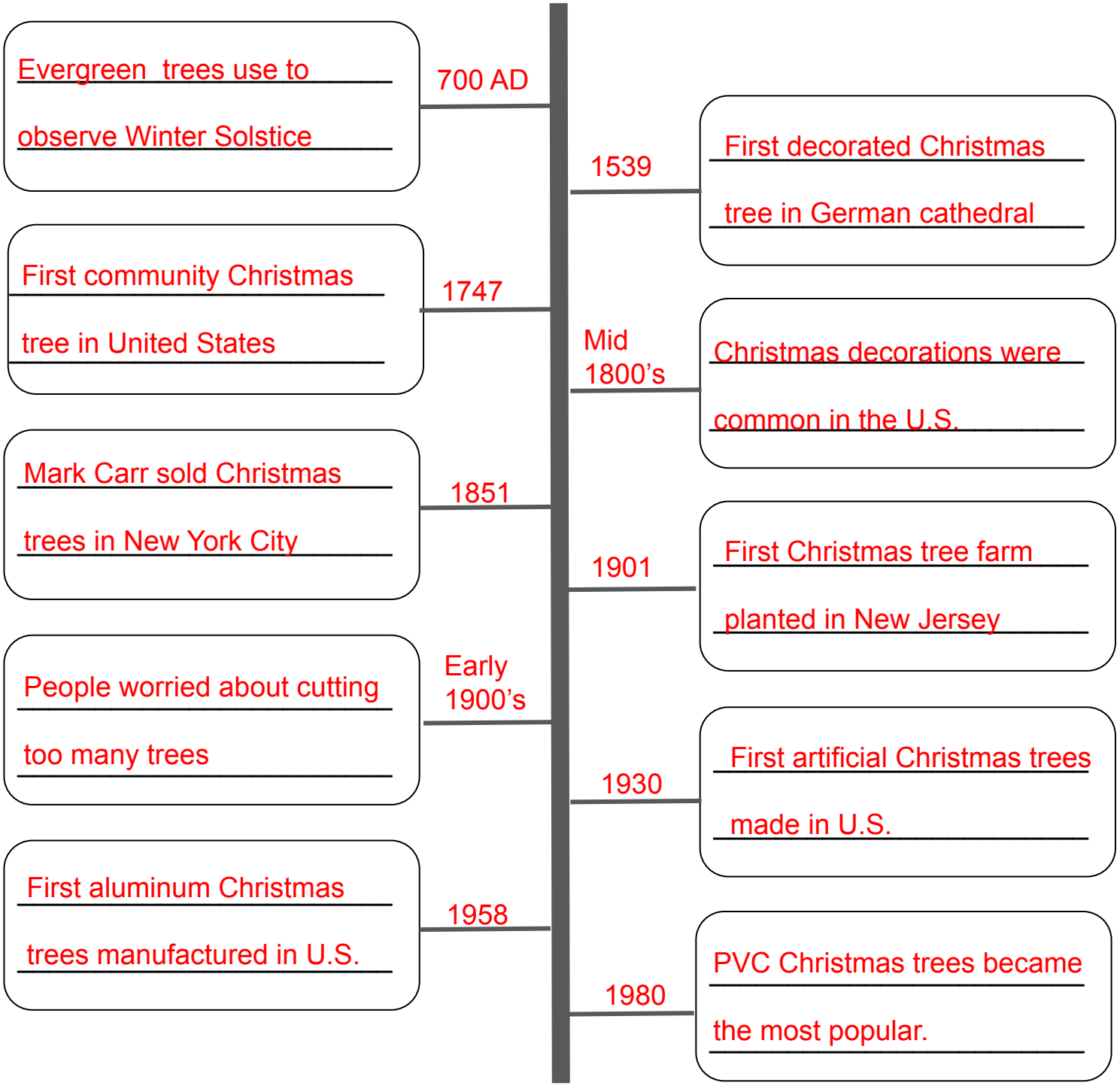
Oh, Christmas Tree

Activity 1 Worksheet 2: Christmas Tree Timeline

ANSWER KEY

Name: _____ Date: _____

Write years from the **"History of Christmas Trees"** reading page on the short lines. Use the box beside the line to write what happened in that year.



Activity 2: Christmas Tree Math, (Math) 1 50 minute class period

Students will use Christmas trees and Christmas tree farming examples to solve real world problems.

Oklahoma Academic Standards

Activity 2: Christmas Tree Math (Subject)

3.N.2.1	Represent multiplication facts by using a variety of approaches, such as repeated addition, equal-sized groups, arrays, area models, equal jumps on a number line and skip counting.
3.N.2.7	Recognize the relationship between multiplication and division to represent and solve real-world problems.
4.A.2.2	Solve for unknowns in problems by solving open sentences (equations) and other problems involving addition, subtraction, multiplication, or division with whole numbers. Use real-world situations to represent number sentences and vice versa.
4.D.1.2	Use tables, bar graphs, timelines, and Venn diagrams to display data sets. The data may include benchmark fractions or decimals (¼, ⅓, ½, ⅔, ¾, 0.25, 0.50, 0.75).
5.A.2.3	Evaluate expressions involving variables when values for the variables are given.

Materials:

- Activity 2 Worksheet 1 **"Christmas Tree Array"**
- Activity 2 Worksheet 2 **"Christmas Tree Farming"**
- Long measuring tape
- Masking tape, marking flags or wooden stakes or skewers

Procedures

1. Conduct a classroom poll to determine what, if any, kind of tree is used in their winter celebrations. Prepare a classroom bar graph with a column for natural trees, a column for artificial trees, a column for no trees and a column for other.
   —Students will draw bar graphs to represent the data they have collected.
2. Have students complete one of the worksheets included with the lesson:
   —Activity 2 Worksheet 1 **"Christmas Tree Array".**
   —Students will learn more about the financial challenges of Christmas tree farming by completing Activity 2 Worksheet 2 **"Christmas Tree Farming".**
   —To help students visualize spacing, measure 6 x 6 spacing outside or in a large area like a gym. Mark each spot with tape (or use a flag or stake if outside). Have students stand on each spot. Have ¼ of the students leave the area to represent the trees that died.

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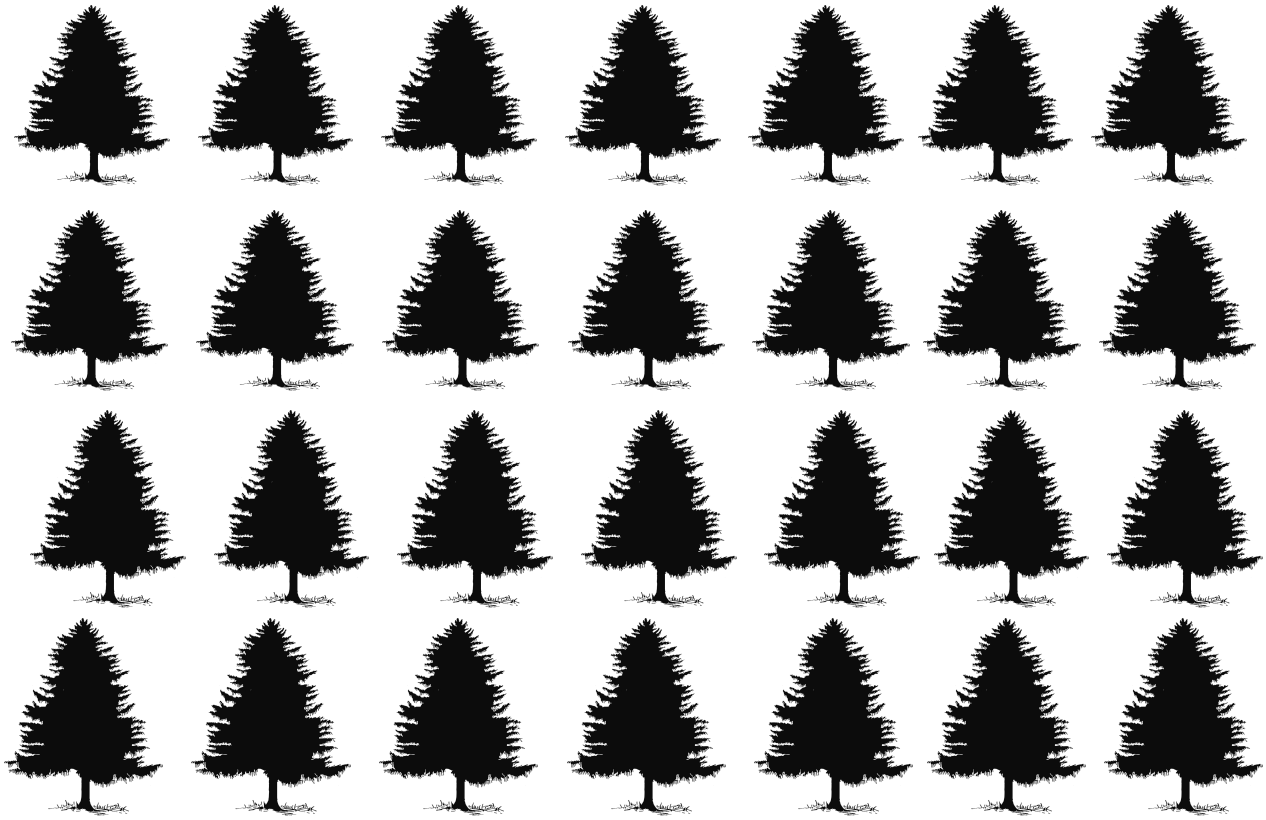
Activity 2 Worksheet 1: Christmas Tree Array

Name: _____ Date: _____



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

1. 7 + 7 + 7 + 7 = _____
2. 4 groups of 7 Christmas trees = _____
3. 4 sevens = _____
4. 4 x 7 = _____
5. Circle six random trees in the array. These trees died. How many trees are left?

   _____ - 6 = _____
6. The remaining trees are sold for $75.00 each. What is the value of the trees that died?

   _____ x _____ = _____

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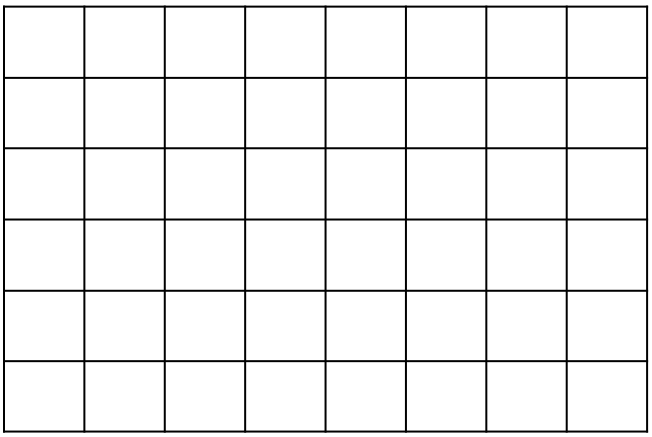
Activity 2 Worksheet 2: Christmas Tree Farming

Name: _____ Date: _____

Write mathematical expressions based on the word problems below.
Solve the problems. Each square in the grid below represents one 6 foot square.

1. Farmer Green planted 8 rows of trees in 6 foot squares. Each row is 36 feet long. How many trees can he expect to harvest when the trees are mature?



2. Farmer Green lost ¼ of the trees to disease in the third year. How many trees will the farmer need to replant?

3. If all of the remaining trees survive, how many will be available to sell when the trees are mature?

4. If Farmer Green charges $60.00 per tree for mature trees, how much will he earn per square foot?

5. When trees are 4-5 feet tall, they are are shaped by shearing. If it takes 20 hours per acre how long would it take Farmer Green to shear 5 acres of trees?

6. If Farmer Green hires 3 workers to shear the trees, and they each shear an equal number of trees, how long will it take to complete the task?

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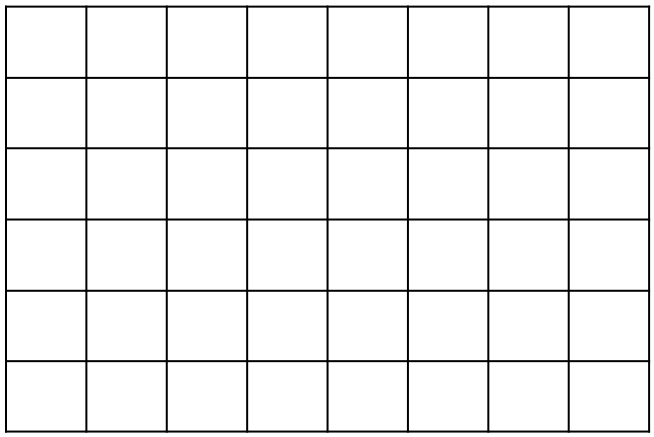
Activity 2 Worksheet 2: Christmas Tree Farming

ANSWER KEY

Name: _____ Date: _____

Write mathematical expressions based on the word problems below.
Solve the problems. Each square in the grid below represents one 6 foot square.



1. Farmer Green planted 8 rows of trees in 6 foot squares. Each row is 36 feet long. How many trees can he expect to harvest when the trees are mature?

   8 rows x 6 trees per row = 48 trees
   If all trees live, farmer Green would harvest 48 trees.

2. Farmer Green lost ¼ of the trees to disease in the third year. How many trees will the farmer need to replant?

   ¼ 48 = 48 ÷ 4 = 12

3. If all of the remaining trees survive, how many will be available to sell when the trees are mature?

   48 - 12 = 36

4. If Farmer Green charges $60.00 per tree for mature trees, how much will he earn per square foot?

   $60 x 36 trees = $2,160 48 feet x 36 feet = 1,720 square feet
   $2160 ÷ 1720 sq. ft. = $1.26 per square foot

5. When trees are 4-5 feet tall, they are are shaped by shearing. If it takes 20 hours per acre how long would it take Farmer Green to shear 5 acres of trees?

   20 hours x 5 acres = 100 hours

6. If Farmer Green hires 3 workers to shear the trees, and they each shear an equal number of trees, how long will it take to complete the task?

   100 hours ÷ 3 workers = 33.33 hours

Activity 3: Coniferous or Deciduous, (Science) 1-2 50 minute class periods

Students will discuss the difference between coniferous and deciduous trees and create models of an evergreen tree.

Oklahoma Academic Standards

Activity 3: Coniferous or Deciduous (Science)

3.LS1.1 4.LS1.1	Develop and use models to describe that organisms have unique and diverse life cycles but all have a common pattern of birth, growth, reproduction, and death.
4.LS.1.1	Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.
5.LS1.1	Support an argument that plants get the materials they need for growth chiefly from air and water.

Materials:

- Activity 3 Reading Page 1 **"Christmas Tree Farms"**
- Activity 3 Worksheet 1 **"How to Grow a Christmas Tree"**
- Craft materials to create tree models (stick for the trunk, leaves, twine for the roots, etc.)

Procedures

1. Students will read Activity 3 Reading Page 1 **"Christmas Tree Farms"**.
   —Have students complete Activity 3 Worksheet 1 **"How to Grow a Christmas Tree"**. Alternately, use the information from the worksheet to lead a discussion about Christmas tree farms.
2. Coniferous evergreen trees and foliage have played a role in winter celebrations throughout history. Since this holiday was a celebration of life, trees that stayed green during the long winters in northern Europe took on special significance.
3. Students will work in groups and use online or library resources to research the differences between coniferous evergreen and deciduous trees. Key points might include:
   - Deciduous trees usually have leaves that change color in the fall. As days get shorter, the chlorophyll no longer masks the underlying color in the leaf.
   - These trees need lots of water and sunlight for photosynthesis. As days get shorter, they drop their leaves and the trees go dormant to conserve energy during the winter.
   - The roots continue to grow in the winter and buds form for the next year's leaves.
   - They bloom and fertilized flowers produce seeds. Some flowers develop edible fruit. Examples are apples, pears, peaches, cherries, plums, pecans, walnuts, etc.
   - Most deciduous trees have a large trunk and and extensive lateral root system just under the soil's surface to support the large canopy. Roots extend past the edge of the branches to soak up rain the drips from the leaves and branches.

Continued procedures:

- ❖ Evergreen trees stay green all year. They do not drop their leaves.
- ❖ Most (but not all) evergreen trees have needles rather than leaves.
- ❖ Fir and spruce are the most popular Christmas tree varieties. They are better suited to the northern U.S. Oklahoma's summers are too hot for many traditional Christmas tree varieties. Most Oklahoma farms grow Virginia and Scotch pine.
- ❖ Most evergreen trees are coniferous. That simply means their seeds are found in cones rather than flowers. The cones form in the spring then open and release their seeds in the fall and winter.
- ❖ A few trees (like bald cypress) are deciduous conifers. They drop their needles, but their seeds come from cones rather than flowers.
- ❖ Tropical evergreen trees (like Magnolia) that grow in the southern U.S. Although they are evergreen, they reproduce via flowers rather than cones. They grow in areas with longer winter days and warmer winter temperatures.
- ❖ Conifers have a taproot system combined with lateral roots to increase water absorption.

—Students will make simple charts to compare and contrast coniferous and deciduous trees.
—Students will display and describe their findings for the class.

2. 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:
   - ➔ taproot
   - ➔ shallow root
   - ➔ trunk
   - ➔ branch
   - ➔ bark
   - ➔ foliage

—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 the role it plays in the survival and growth of the tree.

3. As a long term project, try growing a conifer from seed. In Oklahoma, that will probably be a Virginia or Scotch pine.
   - Cones mature and open up in the fall. If you have a Christmas tree farm in your area, contact the owners and ask them to harvest a cone as it begins to open.
   - Peel back the scales on the cones and carefully remove the seeds. Conifer seeds have "wings" that transport seeds via wind and animals. Remove the wings by rubbing between your fingers.
   - Many tree seeds need 4 - 8 weeks of exposure to cold temperatures to germinate. Place seeds in a zip-top bag with a wet paper towel for at least 4 and up to 8 weeks. The germination rate continues to increase until 8 weeks.
   - Prepare small pots with soilless potting media used for growing fruit and vegetable transplants. Saturate the media with water.
   - Plant 2-3 seeds about ¼ inch deep in each pot. Keep the soil moist until the seeds germinate and you see a small plant.
   - When the tree is several inches tall, it is ready to transplant to a larger pot or outdoor location. Before transplanting, reduce the amount of water and put the pot outside several hours a day to aclimitize to the environment.

Name: _____ Date: _____

Have you ever cut your own Christmas tree? Did you cut a tree from the woods near your home. You might have gone to a special type of farm. Some farms grow Christmas trees instead of wheat or cotton.

Oklahoma has about 30 Christmas tree farms. Many farms let you pick out and cut your own tree. Trees bought direct from farms are very fresh. They will last longer in your home than trees bought from stores or lots.

The Eastern red cedar is Oklahoma's only native evergreen tree. A tree from the woods is probably this type. It dries out fast after it is cut and becomes a fire hazard. The first Christmas tree farms in Oklahoma grew Scots (or Scotch) pine trees. Today many Oklahoma farms grow Virginia pine, White pine, Arizona cypress or Leyland cypress trees. Most fir and spruce trees are grown on Christmas tree farms in northern states.

Seedlings are planted in late winter. The rows are six feet apart. The trees are spaced six feet apart in the rows. This is called six by six spacing. Using this method, 1,200 trees can be planted on one acre of land. Some growers start new trees in partially harvested fields each year. Only about half of the trees planted become marketable Christmas trees.

After trees are planted, farmers must control weeds, insects and plant diseases. As trees grow, they must be shaped. Trees do not grow into a "Christmas tree" shape without help. Young trees are pruned to remove unwanted wood. Most trees need some shaping each year. Some trees are ready to harvest in five years. Other trees need as much as 10 years to reach a height of six to eight feet.

The first Christmas tree farm was planted in 1901.
In 1901 W.V McGalliard planted 25,000 Norway Spruce trees.

Today there are Christmas tree farms in every state.

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Activity 3 Worksheet 1: How to Grow a Christmas Tree

Name: _____ Date: _____

Fill in the blanks.

1. There are about _____ Christmas tree farms in Oklahoma.
2. The _____ _____ _____ is Oklahoma's only native evergreen tree.
3. The Eastern Red Cedar dries out fast and becomes a _____ _____.
4. Name two Christmas tree varieties planted today in Oklahoma

   _____

   _____
5. Most _____ and _____ Christmas trees are grown in states other than Oklahoma.
6. Christmas trees are planted in rows that are six feet apart. Trees are spaced six feet apart in the rows. This is called _____ _____ _____ spacing.
7. Only about _____ of the trees planted grow into Christmas Trees that can be sold.
8. Christmas tree farmers must control _____, _____ and _____ _____ every year.
9. Trees must be _____ to grow into a "Christmas Tree" shape.
10. It takes _____ to _____ years for a tree to be "Christmas Tree" size.

Oh, Christmas Tree

Activity 3 Worksheet 1: How to Grow a Christmas Tree

ANSWER KEY

Name: _____ Date: _____

Fill in the blanks.

1. There are about 30 Christmas tree farms in Oklahoma.
2. The Eastern Red Cedar is Oklahoma's only native evergreen tree.
3. The Eastern Red Cedar dries out fast and becomes a fire hazard.
4. Name two Christmas tree varieties planted today in Oklahoma

   Virginia pine, White pine,

   Arizona cypress or Leyland cypress
5. Most fir and spruce Christmas trees are grown in states other than Oklahoma.
6. Christmas trees are planted in rows that are six feet apart. Trees are spaced six feet apart in the rows. This is called six by six spacing.
7. Only about half of the trees planted grow into Christmas Trees that can be sold.
8. Christmas tree farmers must control weeds, insects and plant diseases every year.
9. Trees must be pruned to grow into a "Christmas Tree" shape.
10. It takes five to ten years for a tree to be "Christmas Tree" size.