Our Family's Peach Farm: Math Lesson

Grade Level/Age Range

3rd – 5th grade, 8-10 years old

Time

45 minutes

Purpose

To create an understanding of how Georgia peach farmers utilize math when operating their farms.

Georgia Standards of Excellence

3rd Grade

- **MGSE3.OA.3** - Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, by using drawings and equations with a symbol for the unknown number to represent the problem.
- **MGSE3.OA.8 -** Solve two-step word problems using the four operations.

4th grade

- **MGSE4.OA.3-** Solve multistep word problems with whole numbers and having whole-number answers using four operation, including problems in which remainders must be interpreted. Represent these problems using equations with a symbol or letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.
- **MGSE4.NBT.5** - Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
- **MGSE4.NBT.6** - Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division.
- **MGSE4.MD.2** - Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit.

Our Family's Peach Farm: Math Lesson

<u>5th grade</u>

- **MGSE.5NF.2**- Solve word problems involving addition and subtraction of fractions, including cases of unlike denominators (by using visual fraction models or equations to represent the problem). Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

Materials

- *My Family's Peach Farm*
- *My Family's Peach Farm* Math Worksheet
- *My Family's Peach Farm* Math PowerPoint

Resources

- Georgia Farm Bureau: https://www.gfb.org/
- Georgia Peach Council: https://gapeaches.org/

Vocabulary

Drip Tape- used for irrigation to allow water to drip slowly to the roots of the plants, either from above the soil surface or buried below the surface.

Harvesting- the process or period of gathering in crops.

Irrigation- the supply of water to land or crops to help plants grow.

Nutritional- includes everything in your food, such as vitamins, protein, fat and more. It's important to eat a variety of foods, including fruits and vegetables, dairy products and grains so that you have what you need to grow and be healthy.

Orchard- a piece of land planted with fruit trees.

Prune- to trim a tree by cutting away dead or overgrown branches to let in more sun and increase fruitfulness and growth.

Ripening- the process of being full-grown and ready to eat.

Our Family's Peach Farm: Math Lesson

Background

Peach farms play a vital role in the community, providing many stores with a variety of peaches and employing those in the surrounding community. Georgia grows 130 million pounds of peaches per year. Math is consistently being used by peach farmers. For example. Famers need to determine how many acres they have and how much water they need to irrigate those acres. Eventually farmers will need to determine how many peaches they will harvest (yield) to ensure they make enough money to support their farm and family.

Procedures

1. Read *My Family's Peach Farm* to the students or have them read to themselves. Provide time for them to review all information and make observations.

2. Lead discussion with the students about the following:
   a) Was there any information which was surprising and/or new to them?
   b) Were there any numbers they remember seeing in the book? What did those numbers represent?
      I. 130 years: how long the family has been growing peaches, p3
      II. 1,800 acres: how many acres the family peach farm has, p3
      III. 130 million pounds: Number of peaches Georgia grows per year, p3
      IV. 32°- 45° degrees Fahrenheit: the chill temperatures peaches need to grow, p6
      V. 600 to 1,000: the number of chill hours peach trees need, p6
      VI. 12-15: the average life span of a peach tree, p8
      VII. 10 gallons: amount of water used per acre, per minute, p9
      VIII. 1 acre: the size of one football field, p9
      IX. 80 sixteen ounce bottles: how much water 10 gallons is equal to, p9
      X. 4,000 years ago: when China began growing peaches, p10
      XI. 30 minutes: how long peaches are put in a cold water bath, p16
      XII. 136: number of peaches per acre, p24
      XIII. 400: number of peaches produced per tree, p24
      XIV. 75: number of wagons filled each day, p24
      XV. 120: number of buckets in a wagon, p24
      XVI. 80: number of peaches in a bucket, p24
      XVII. 1/2 pound: the average weight of a single peach, p24
   c) How do they think farmers use math?

3. Explain that a peach farmer uses math in many ways: to figure out how many trees (seeds) to plant, to estimate how many peaches they will harvest, to know how much water to give their crops.

4. Provide the *My Family's Peach Farm* Math worksheet for each student or student group to complete.

5. Answer keys

    3rd grade worksheet
    - Question 1: 50 gallons (5 * 10)
    - Question 2: 480 buckets (120+120+120+120)
    - Question 3: 1,200 peaches for three trees (400 + 400 + 400); 975 peaches after pests (1,200-225)
    - Question 4: 72 wagons (two steps: 24/4=6; 6*12 = 72)
    - Question 5: 21 peach cobblers (two steps: 14 * 6 = 84; 84/4 = 21)

    4th grade worksheet

    - Question 1: 816 seedlings (6 * 136)
    - Question 2: 270 gallons (27 * 10); 1,350 gallons (270 * 5)
    - Question 3: 80 peaches (400/5)
    - Question 4: 24 baskets ($60/$2.50); 144 peaches (24 * 6)

    5th grade worksheet

    - Question 1: 1,088 seedlings (8 *136)
    - Question 2: 2,400 gallons (two steps: 8 * 10 = 80; 80 * 30 = 2,400)
    - Question 3: 720 buckets (6 * 120)
    - Question 4: 57,600 peaches (two steps: 120 * 80 = 9,600; 9,600 * 6 = 57,600)
    - BONUS: 144 trees (57,600/400)

Other Reading Connections

- *The Math Chef: Over 60 Math Activities and Recipes for Kids* by Karen Eich Drummond and Tina Cash-Walsh
  This book demonstrates how cooking and math go hand in hand. All activities and recipes are kid-tested and require only common ingredients and kitchen utensils.
- *Once Upon a Dime* by Nancy Kelly Allen
  This book follows the adventures of a farmer who can grow money by using different kinds of fertilizer!

Did You Know? (Fun Facts)

- The U.S. Department of Agriculture ranks Georgia as one of the top four peach-producing states along with California, South Carolina and New Jersey.
- Most of the peaches sold in Georgia are sold fresh.
- Georgia's peaches mainly grow in Crawford, Taylor, Macon and Peach counties.
- There are two primary commercial peach-growing regions in Georgia:
  - The central region which yields ~1.6 million peach trees (Crawford, Macon, Peach, and Taylor Counties),
  - The southern region which yields ~30 million pounds of peaches (Brooks and Pierce Counties).
  - In total each year Georgia produces over 130 million pounds of peaches!

Extensions

- Garden
  - Use the school garden or grow a small potted garden in your classroom.
  - Have your students count the total number of each fruit or vegetable plant and have them estimate the number of fruit/vegetables that each plant will produce. Example: 10 tomato plants, each plant will grow 3 tomatoes.
  - With the class, use this data to estimate the garden's yield (final estimated amount of food produced).
  - Is there a recipe your class would like to try using the garden plants? How much will they need to feed the class or even the whole school? Will the garden produce enough?
  - Check the garden every week to see the progress. When ready, start harvesting so your class can enjoy the 'fruits' of their labor!
- Have students record how their families use math every day for a week outside of school. Review what math was used and how it impacted them.

Sources

Falkenberg-Hull, E. (May 2020). 10 things you probably didn't know about Georgia peaches. In Explore Georgia. Retrieved June 2020 from https://www.exploregeorgia.org/things-to-do/blog/10-things-you-probably-didnt-know-about-georgia-peaches.

Galileo. Georgia*Info*. (n.d.). *Peaches*. Retrieved November 1, 2019, from https://georgiainfo.galileo.usg.edu/topics/economy/article/peaches