



You are the Farmer

Audience: Principles of Agriculture, Food, & Natural Resources; Mathematical Applications in Agriculture, Food, & Natural Resources

Activity Length: 45-50 minutes OR two 50-minute periods if research is not done as a homework assignment

TEKS:

Principles of Agriculture, Food, & Natural Resources

1.B. Apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in agriculture, food, and natural resources

1.E. Identify careers in agriculture, food, and natural resources with required aptitudes in science, technology, engineering, mathematics, language arts, and social studies

8. The student applies problem-solving, mathematical, and organizational skills in order to maintain financial and logistical records

Mathematical Applications in Agriculture, Food, & Natural Resources

1.F. Research career topics using technology such as the Internet

2.A. Apply mathematics to problems arising in everyday life, society, and the workplace

4.A. Add, subtract, multiply, and divide whole numbers, fractions, and decimals in calculations related to agriculture, food, and natural resources

Objectives:

- The student will understand that farming is a business which requires many different math computations.
- The student will perform basic and multi-step math operations in calculating the expenses of farming.
- The student will understand that there are many occupations related to agriculture besides actual production of food and fiber.

Introduction:

Operating a farm is a multi-faceted business. Like any business, farmers must purchase supplies and services and sell products. Farmers need a good understanding of agri-business and economics to make a profit. They work with many individuals and companies to supply the needs of their farm and sell their products. Farmers must know how to keep an organized budget, compare prices, and make wise financial decisions.

Farmers use math in many of their day-to-day operations. For example, farmers use math to determine the amount of seed they need to plant their crop and how much it will cost. They also need math to purchase equipment and make payments. Math is important for determining taxes and insurance. It also helps farmers keep track of how much their livestock weighs, how much milk their cows produce, their crop yields per acre, etc.



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Students will learn that there is much more involved in farming than simply raising a few animals or planting some crops. By reading and completing the following problems, teachers can reinforce basic math operations, while showing students some examples of how math is used in agriculture.

Additionally, students will learn that there are many careers in agriculture that they might not be aware of. Agriculture is everywhere and many people make their living in an agriculture-related career. This activity can be used to help students understand how various agricultural careers might be more prevalent in different regions.

Materials Needed:

“Ag Careers Are Everywhere” worksheet

“You Are the Farmer” worksheet



Activity Outline:

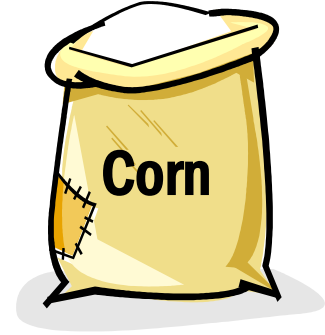
1. Initiate a discussion with your students about agriculture occupations that require math. Have them name the occupations. The class should discuss how math is present in agriculture based on prior topics studied in the course.
2. Make a list of the agriculturally related occupations that require math on the board. Once the class completes a list, have students view the “Ag Careers Are Everywhere” handout. This handout will likely include some agriculture-related careers that are not listed on the board.
3. Once the students know some agricultural occupations that require math, have them complete the worksheet “You Are the Farmer.” The worksheet will give the students a better idea of the expenses a farmer incurs just to plant a crop in the field. When the students are done with the worksheet, go over the answers so they understand them. Discuss how a farmer needs to know math to run his or her business. You can take this opportunity to talk about simple and complex math and how both are necessary for farmers to make accurate and sustainable decisions based on what their plants and animals need.
4. Once students complete the worksheet, have students pair up and write TWO of their own math problems that could potentially arise for a farmer, rancher, or other ag-related job. Encourage students to think critically to develop questions that are more difficult than the ones they just solved.
5. Extension Activity: Have students select one occupation from the “Ag Careers Are Everywhere” handout and research the career to find out
 - a. Where geographically they might be able to do that job
 - b. Required and recommended education
 - c. Salary/Pay
 - d. Opportunity for Advancement
 - e. Why people enjoy the career option
 - f. And any additional information that can be found
6. After completing research, students should create an engaging presentation as if they are a recruiter giving a presentation about the career opportunity to students at a local college.



You are the Farmer

You are a farmer in Texas who grows soybeans, wheat, and corn. This year you make the decision to plant corn on your farm. Use the following information to complete the activity. You will have to round some answers to the nearest whole dollar and full container.

- *Seed corn \$70 per acre.
- *Fertilizer costs \$95 per acre.
- *Fuel, lube, and labor cost \$50 per acre.
- *Herbicide costs \$345 for a 60-ounce container that treats 40 acres.
- *Insecticide costs an additional \$20 per acre.
- *Your farm is in Texas and the average size is 523 acres.



How much will it cost to plant seed corn on your farm? _____

Corn rootworms have been a problem in the past. They eat the roots and cause the corn to die. You decide to purchase seed with insecticide, controlling rootworms. How much will this cost? _____ What will this increase your seed cost to? _____

You need to purchase a new tractor and planter. The bank will loan you the money to buy the equipment, but you are required to make payments of \$18,500 every year for seven years. In addition, you have payments on previous purchases of \$5,500 per year. What is your total annual equipment cost for one year? _____

You need to put fertilizer on your corn crop. How much will this cost? _____

Weeds are starting to grow in your corn field. You need to apply an herbicide. How many containers will you need? _____ How much will it cost to control weeds? _____

You cash lease your farmland for \$50 per acre. What is the total rent for your farm? _____

What is the total cost for fuel, lube, and labor? _____

Your corn crop is great! You harvest 130 bushels per acre. What is the total number of bushels of corn harvested? _____ There are 56 pounds in one bushel. How many pounds of corn did you harvest? _____

You received \$3.75 per bushel for your corn. How much did you get for your crop? _____

How much were your expenses for raising corn? _____

How much profit did you make from your corn crop? _____



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You Are the Farmer
KEY

How much will it cost to plant seed corn on your farm? 36,610

Corn rootworms have been a problem in the past, eating the roots, causing the corn to die. You decide to purchase seed with insecticide, controlling rootworms. How much will this cost? 10,460 What will this increase your seed cost to? 47,070

You need to purchase a new tractor and planter. The bank will loan you the money to buy the equipment, but you are required to make payments of \$18,500 every year for seven years. In addition, you have payments on previous purchases of \$5,500 per year. What is your total annual equipment cost for one year? 24,000

You need to put fertilizer on your corn crop. How much will this cost? 49,685

Weeds are starting to grow in your corn field. You need to apply a herbicide. How many containers will you need? 14 How much will it cost to control weeds? 4,830

You cash lease your farm land for \$50 per acre. What is the total rent for your farm? 26,150

What is the total cost for fuel, lube and labor? 26,150

Your corn crop is great! You harvest 130 bushels per acre. What is the total number of bushels of corn harvested? 67,990 There are 56 pounds in one bushel. How many pounds of corn did you harvest? 1,214

You received \$3.75 per bushel for your corn. How much did you get for your crop? 254,963

How much were your expenses for raising corn? 177,885

How much profit did you make from your corn crop? 77,078



Ag Careers Are Everywhere!

Agriculture is the art and science of growing food and clothing. You don't have to come from a farm to have an occupation in agriculture. Any occupation that involves growing, harvesting, raising, transporting, processing, making, selling, trading or researching of food and/or fiber (for clothing) are agricultural occupations. When you stop and think about it, agriculture is all around us! Take a look at the list of agricultural occupations below. Most agricultural occupations require math, but the ones listed here are the most prevalent.

<p><u>Agricultural Production Specialists</u></p> <ul style="list-style-type: none"> • Aquaculturalist • Greenhouse Manager • Rancher • Fruit and Vegetable Grower • Farm Manager • Specialty Animal Producer • Grain and/or Livestock Farmer • Turf Producer 	<p><u>Managers and Financial Specialists</u></p> <ul style="list-style-type: none"> • Accountant • Retail Manager • Policy Analyst • Consultant • Banker • Wholesale Manager • Food Service Manager • Economist • Insurance Agency Manager • Computer Systems Analyst
<p><u>Marketing, Merchandising, and Sales Rep</u></p> <ul style="list-style-type: none"> • Grain Merchandiser • Market Analyst • Restaurant Manager • Insurance Agent • Commodity Broker • Sales Representative • Export Sales Manager • Landscape Contractor • Advertising Manager 	<p><u>Scientists, Engineers, & Related Specialists</u></p> <ul style="list-style-type: none"> • Agronomist • Animal Scientist • Agricultural Engineer • Research Technician • Environmental Scientist • Water Quality Specialist • Landscape Architect • Plant Scientist • Food Scientist
<p><u>Communication & Education</u></p> <ul style="list-style-type: none"> • Information Specialist • Computer Software Designer • Agricultural/Horticultural Teacher • Radio/Television Broadcaster 	<p><u>Social Services Professionals</u></p> <ul style="list-style-type: none"> • Dietitian • Food Inspector • Regulatory Agent • Outdoor Recreation Specialist