

# Next Year's Seeds

## Utah Math Core Standards



### Materials

- ◆ 1-2 pounds of sunflower, peanut, or pistachios, or pine nuts in the shell (check for peanut allergies)
- ◆ Paper cups for each group of four students (5-7)
- ◆ Copied set of the situation playing cards for each group of four
- ◆ Calculator for each group (optional)

### Background

Being able to compute in a variety of ways is a life skill and part of the National and State Standards for mathematics. How many times a day are we asked, or do we ask, “How much?” “How big?” “How far?” Fortunately, it’s easy to incorporate the math standards of computation into daily curriculum. This lesson provides students with an opportunity to practice addition, subtraction, multiplication and division with both whole numbers and fractions.

According to Wikipedia (online Free Encyclopedia), “In mathematics, a fraction is a way of expressing a quantity based on an amount that is divided into a number of equal-sized parts. For example, each part of a pie split into four equal parts is called a quarter (and represented numerically as  $\frac{1}{4}$ ); two quarters is half the cake, and eight quarters would make two pies. Mathematically, a fraction is a quotient (end result of a division problem) of numbers, like  $\frac{3}{4}$ . In the pie example shown, a quarter is represented numerically as  $\frac{1}{4}$ ; the bottom number, called the denominator, is the total number of equal parts making up the pie as a whole; and the top number, called the numerator, is the number of these parts we have. For example, the fraction  $\frac{3}{4}$  represents three quarters. The numerator and denominator may be separated by a slanting line, or may be written above and below a horizontal line.

Fifth grade is where the comprehension of fractions becomes very important and where the integration of computation is truly measured. Students should be able to “identify relationships among whole numbers, fractions, decimals, and percents,” “solve problems using the four operations with whole numbers, decimals, and fractions,” and “model and illustrate meanings of operations and describe how they relate. Fifth graders should be able to represent mixed numbers and improper fractions in various ways (e.g., rulers, objects, number lines, symbols), rename whole numbers as fractions with different denominators (e.g.,  $5 = \frac{5}{1}$ ,  $3 = \frac{6}{2}$ ,  $1 = \frac{7}{7}$ ), and model and calculate equivalent forms of a fraction and describe the process used.

Sixth graders practice the skills learned in fifth grade and build upon these skills with more complicated problems. Students need to be able to write a fraction or ratio in simplest form, name equivalent forms for fractions (halves, thirds, fourths, fifths, tenths), ratios, percents, and decimals, including repeating or terminating decimals, and relate percents less than 1% or greater than 100% to equivalent fractions, decimals, whole numbers, and mixed numbers. Farmers and gardeners use math to plan ahead. Every time they earn

**Time:** 30 minutes

**Grade Level:** 6

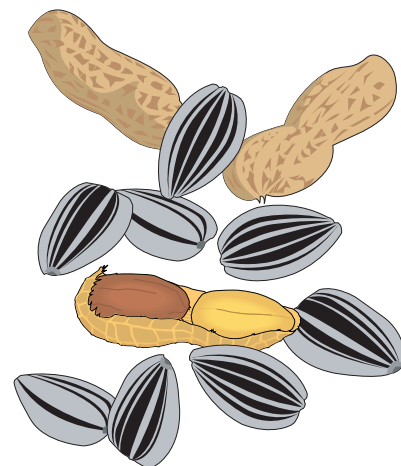
### Social Studies, Standard 1

Students will understand how ancient civilizations developed and how they contributed to the current state of the world.

#### Objective 4

Analyze how the earliest civilizations created technologies and systems to meet community and personal needs.

- Identify a current issue facing the world and propose a role the United States could play in being part of the solution (e.g. genocide, child labor, civil rights, education, public health, environmental protections, suffrage, economic disparities).



money from the crops or livestock they produce, they have to put part of it back into the business. Some of the money goes to repairing or replacing equipment. Some of it goes to buy new equipment to improve next year's crop. Some of the money buys fertilizer or seed.

Our country's first farmers didn't sell their crops for money. Without advanced technology to help them, they were able to raise little more than what they needed to feed their families. If there was any left over they bartered with other farmers to get crops or livestock they didn't raise themselves. In addition, a portion of every crop had to be set aside as seed so they could grow a new crop in the coming year. No matter how low the food supply got during the winter, they knew they had to stay out of the wheat, corn, barley or other seeds they had set aside to plant.

Many immigrants carried seeds with them in pouches so they could get a good start in the New World. Seeds were not available like they are today, sold in colorful paper packages at the local grocery store. Even if they had been, there was little money available for buying them. Instead, early American farmers bartered with the Indians or other farmers to get what they needed. Sometimes they used catalogs to order seeds from England. Over the winter seeds had to be stored in a cool, dry place, possibly in a cellar or in a sealed container buried underground. Careful farmers saved twice as much seed as they would need for the next year's crop, just in case there was a crop failure.

If your students have ever earned money for tasks or chores, they probably know that you can't spend all you earn. Some of the money has to be set aside for purchases that will need to be made in the future. This lesson plan uses social studies content and science concepts to practice and review math skills outlined in the objectives.

### Activity Procedures

1. Using the situation cards, review with the students the action that should be taken for each card. Demonstrate with examples the calculations that should be made for each situation. (Note: there are five "good cards" and five "bad cards." Because two cards will be randomly removed and the remaining eight cards shuffled, each group will make different calculations.)
2. Divide the class into groups of four or five and provide each group a cup, and a set of situation playing cards.
3. Ask each group to sit in a circle.
4. One person from each group should count the group members and then get four times that many seeds from the bag/bowl of seeds you have placed in a central location. These seeds should be placed into the group cup.
5. Explain that the seeds in the cup represent the year's harvest. Instruct each group to pass the cup around so each member can take two seeds to eat (or give it to someone else or discard). The seeds that remain in the cup represent the seeds needed to raise next year's crop.
6. Each group should randomly remove two cards from its stack and set aside.
7. Taking turns, each person in the group draws a situation card from the pile and follow the card instructions. As each group

### Strategies for Teaching Math Facts on the Web

[www.multiplication.com](http://www.multiplication.com)

[math.about.com/bltricks.htm](http://math.about.com/bltricks.htm)

[www.teach-at-home.com/ITaylor2.asp](http://www.teach-at-home.com/ITaylor2.asp)

member draws a card the entire group needs to make sure the calculations are made correctly; it will be the difference between a farm's survival or bankruptcy (failure). Numbers should be rounded off to the closest whole number, if necessary.

8. Before continuing with instructions from another card, have the group pass the cup around again so each player can get another seed to eat. When there are not enough seeds left for every group member to have one, that group must drop out of the game.
9. After the group has drawn all eight cards (two were removed), each group member should eat one more seed.
10. The group with the highest number of seeds remaining has made the greatest profit, and will survive another year!

### **Additional Activities, What's Next?**

1. Discuss the relationship between percentages, fractions and decimals. Where might students use each type of number?
2. Repeat the game three times so that each group has a good chance of bringing in a harvest.
3. Play the game two times with the calculator and then one time without to enhance mind math.
4. Have students make their own situation cards and repeat the game.
5. Play the game again, but have each group keep records of its gains and losses and create graphs to illustrate them.
6. Discuss the expression "seed money" in terms of what they have learned about early farmers saving seeds for the coming year.
7. Discuss the value of having markets where seeds can be sold in exchange for dollars to buy other items.
8. Have students discuss the saying "A penny saved is a penny earned" in relation to what they learned from the above activity.
9. Use a store advertisement to calculate prices based upon percentages marked down.

# Next Year's Seeds Situation Cards

Your tractor broke down in the middle of harvest. Give up  $\frac{1}{5}$  (.2 or 20%) of the seeds in your cup. (If necessary, round to the nearest whole seed.)



You need to purchase a new planter or seed drill. Give up  $\frac{3}{4}$  (.75 or 75%) of the seeds in your cup. (If necessary, round to the nearest whole seed.)



Freezing destroys some of the crop in another part of the country and causes the price of your seed crop to go up. Multiply the number of seeds in your cup by two and add them to your cup. (If necessary, round to the nearest whole seed.)



Your new irrigation system increases your crop yield by 20%. Increase the number of seeds in your cup by 20% (.20).



A fungus has destroyed half your supply of seeds. Give up half the seeds in your cup.



Your new equipment allows you to plant 10% more. Increase the number of seeds in your cup by 10% (.10).



Weather conditions are just right for your crop. You have enough left over to sell. Multiply the number of seeds in your cup by 1.5, and add that number to your cup.



Your neighbor offers to lease you his field for the season. Multiply the number of seeds you have in your cup by 1.75 and add that number to your cup.



Your best employee goes away to college and you have to train someone new. Give up  $\frac{1}{10}$  (.1 or 10%) of the seeds in your cup.



The price of gasoline goes up. Multiply the number of seeds in your cup by 5% (.05) and subtract that number of seeds from your cup.

