

Applied Math Activities

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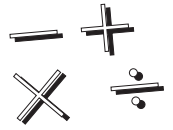
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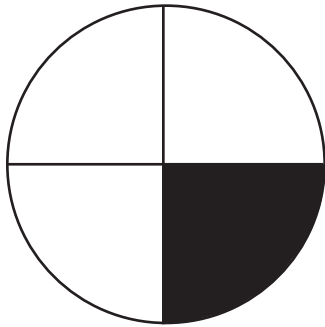
Math Skill Sheet A



Understanding Fractions

Vocabulary: numerator, denominator, equivalent fractions

Using fractions is an important skill to master, especially when you work with recipes. Here is a quick review of how fractions work.



Fractions can be used to indicate part of a whole. For example, suppose a pie has been cut into four pieces. One piece has been eaten and three are left. You can express this as a fraction:

One-fourth ($\frac{1}{4}$) of the pie has been eaten.

Three-fourths ($\frac{3}{4}$) of the pie is left.

The number at the top of a fraction is called the *numerator*. \longrightarrow

The number at the bottom is called the *denominator*. \longrightarrow

$\frac{3}{4}$

\longleftarrow A bar separates the numerator from the denominator.

Equivalent fractions have the same value as one another. To change a fraction to an equivalent, you multiply or divide both the numerator and denominator by the same number. For instance, an equivalent fraction for $\frac{2}{3}$ could be $\frac{6}{9}$.

$$\frac{2}{3}$$

$\rightarrow 2 \times 3 = 6 \rightarrow$

$\rightarrow 3 \times 3 = 9 \rightarrow$

$$\frac{6}{9}$$

Here are more fraction facts:

- Fractions can also be used to express the same idea as dividing two whole numbers.

$$\frac{5}{2} \rightarrow \text{means the same thing as } \rightarrow 5 \div 2$$

- When the numerator is smaller than the denominator, the fraction is less than 1.
- When the numerator and denominator are the same (but not 0), the fraction is equal to 1.

$$\frac{3}{3} = 1 \quad \frac{25}{25} = 1$$

- When the numerator is larger than the denominator, the fraction is greater than 1.
- To write any whole number as a fraction, put the number over the denominator 1.

$$\frac{2}{1} = 2 \quad \frac{5}{1} = 5$$

Math Skill Sheet A: Understanding Fractions (continued)

Practice Your Skills

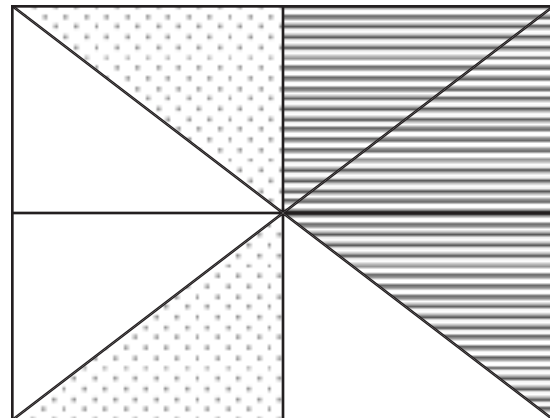
1. Express the shaded part of the figure to the right as a fraction. _____
2. Express the non-shaded part of the figure to the right as a fraction. _____
3. Suppose there are six people in your family. One is a vegetarian.
Express the number of people who are vegetarians as a fraction. _____



4. Write an equivalent fraction for each of the following:

- a. $\frac{2}{5}$ _____
- b. $\frac{4}{7}$ _____
- c. $\frac{1}{3}$ _____
- d. $\frac{3}{6}$ _____
- e. $\frac{8}{9}$ _____

5. What part of the shape to the right is shaded with lines? Write the equivalent fraction in the following space.

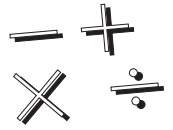


6. What part is NOT shaded? Write an equivalent fraction for the non-shaded part in the following space.

7. What part is shaded with dots? Write an equivalent fraction in the following space.

8. There are 12 pieces in a pizza. Four pieces have mushrooms, 2 pieces have green pepper, 3 have hamburger, and 3 have pepperoni.

- a. What fraction of the pizza has mushrooms on it? _____
- b. What fraction of the pizza has meat on it? _____
- c. If 6 people want to eat equal portions of the whole pizza, how many pieces does each person eat?

Math Skill Sheet B**Reducing Fractions****Vocabulary:** reduce, lowest terms

To *reduce*, or simplify, a fraction, you divide both the numerator and denominator by the same number. The simplified fraction has the same value as the original. For example, you could reduce $\frac{6}{12}$ by dividing both the numerator and denominator by 3:

$$\begin{array}{l} 6 \div 3 = 2 \\ 12 \div 3 = 4 \end{array} \quad \text{SO . . .} \quad \frac{6}{12} = \frac{2}{4}$$

However, notice that $\frac{2}{4}$ can still be reduced:

$$\begin{array}{l} 2 \div 2 = 1 \\ 4 \div 2 = 2 \end{array} \quad \text{SO . . .} \quad \frac{2}{4} = \frac{1}{2}$$

Still yet, in order to reduce the above fraction to its lowest terms, you could also divide both the numerator and denominator by 6. See the following example.

$$\begin{array}{l} 6 \div 6 = 1 \\ 12 \div 6 = 2 \end{array} \quad \text{SO . . .} \quad \frac{6}{12} = \frac{1}{2}$$

Now you have reduced $\frac{6}{12}$ until you cannot reduce it anymore. This is called reducing the fraction to its *lowest terms*.

When you want to reduce a fraction to its lowest terms, look for the largest number by which you can divide both the numerator and denominator. Here are more examples:

$$\frac{3}{9} \rightarrow \text{divide numerator and denominator by } 3 \rightarrow \frac{1}{3}$$

$$\frac{6}{8} \rightarrow \text{divide numerator and denominator by } 2 \rightarrow \frac{3}{4}$$

$$\frac{18}{27} \rightarrow \text{divide numerator and denominator by } 9 \rightarrow \frac{2}{3}$$

Practice Your Skills

1. Circle the fractions that are already in lowest terms:

$\frac{13}{39}$

$\frac{2}{5}$

$\frac{7}{8}$

$\frac{9}{18}$

Math Skill Sheet B: Reducing Fractions (continued)

2. For each fraction, find the largest number by which you can divide both numerator and denominator. Then reduce the fraction to its lowest terms. Show your work in the space provided.

a. $\frac{16}{24}$ Divide numerator and denominator by: _____ to get: _____

b. $\frac{12}{15}$ Divide numerator and denominator by: _____ to get: _____

c. $\frac{8}{10}$ Divide numerator and denominator by: _____ to get: _____

d. $\frac{12}{16}$ Divide numerator and denominator by: _____ to get: _____

e. $\frac{5}{25}$ Divide numerator and denominator by: _____ to get: _____

f. $\frac{14}{28}$ Divide numerator and denominator by: _____ to get: _____

g. $\frac{9}{3}$ Divide numerator and denominator by: _____ to get: _____

h. $\frac{12}{60}$ Divide numerator and denominator by: _____ to get: _____

i. $\frac{3}{18}$ Divide numerator and denominator by: _____ to get: _____

j. $\frac{12}{14}$ Divide numerator and denominator by: _____ to get: _____

k. $\frac{3}{33}$ Divide numerator and denominator by: _____ to get: _____

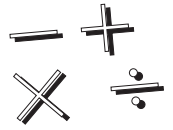
l. $\frac{4}{16}$ Divide numerator and denominator by: _____ to get: _____

m. $\frac{21}{28}$ Divide numerator and denominator by: _____ to get: _____

n. $\frac{6}{26}$ Divide numerator and denominator by: _____ to get: _____

Math Skill Sheet C

Mixed Numbers and Improper Fractions



Vocabulary: mixed number, improper fraction

A *mixed number* is a combination of a whole number and a fraction:

$$1\frac{1}{2} \quad 2\frac{3}{4}$$

A mixed number can also be written as an *improper fraction*. This is a fraction with a numerator larger than the denominator.

$$1\frac{1}{2} = \frac{3}{2}$$

When you work with fractions, it is helpful to know how to change a mixed number to an improper fraction and back. For example, if you increase or decrease the yield of a recipe, you may end up with an amount like $\frac{3}{2}$ cup flour. If you know that $\frac{3}{2} = 1\frac{1}{2}$, you will be able to measure the flour easily. On the other hand, sometimes you need to change a mixed number to an improper fraction so that you can multiply or divide more easily.

To change a mixed number to an improper fraction:

Step 1: Multiply the denominator by the whole number. Add the numerator.

$$1\frac{2}{3} \rightarrow (3 \times 1) + 2 = 5$$

Step 2: Write the result as the numerator of the new fraction. $1\frac{2}{3} = \frac{5}{3}$

Use the same denominator as before.

Step 3: Check to see if you can reduce the fraction

$$1\frac{2}{3} = \frac{5}{3}$$

To change an improper fraction to a mixed number:

Step 1: Rewrite the fraction as a division problem. $\frac{7}{3}$

$$\begin{array}{r} 2 \\ 3 \overline{)7} \\ \underline{-6} \\ 1 \end{array}$$

Step 2: Divide to get a whole number and a remainder.

Step 3: Write the whole number.

Use the remainder as the numerator.

$$\frac{7}{3} = 2\frac{1}{3}$$

Use the same denominator as before.

Math Skill Sheet C: Mixed Numbers and Improper Fractions (continued)**Practice Your Skills**

Write as an improper fraction:

1. $1\frac{3}{4}$ _____

2. $3\frac{1}{2}$ _____

3. $4\frac{5}{8}$ _____

4. $6\frac{2}{3}$ _____

5. $8\frac{7}{8}$ _____

6. $7\frac{5}{6}$ _____

7. $3\frac{1}{2}$ _____

8. $4\frac{3}{7}$ _____

9. $12\frac{1}{3}$ _____

10. $32\frac{1}{4}$ _____

11. $16\frac{2}{3}$ _____

12. $15\frac{1}{5}$ _____

13. $1\frac{8}{9}$ _____

14. $9\frac{6}{7}$ _____

15. $10\frac{4}{5}$ _____

Write as a mixed number:

16. $\frac{9}{4}$ _____

17. $\frac{8}{5}$ _____

18. $\frac{27}{8}$ _____

19. $\frac{32}{6}$ _____

20. $\frac{12}{5}$ _____

21. $\frac{11}{4}$ _____

22. $\frac{13}{5}$ _____

23. $\frac{16}{3}$ _____

24. $\frac{26}{8}$ _____

25. $\frac{18}{7}$ _____

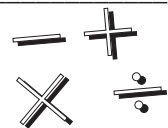
26. $\frac{21}{6}$ _____

27. $\frac{8}{3}$ _____

28. $\frac{46}{7}$ _____

29. $\frac{31}{4}$ _____

30. $\frac{20}{9}$ _____

Math Skill Sheet D**Multiplying Fractions**

As you work with measurements and recipes, you will sometimes need to multiply fractions. For example, a recipe may call for $\frac{1}{4}$ cup of tomato sauce. If you want to increase the yield of the recipe to make twice as many servings, you will have to multiply $\frac{1}{4}$ by 2 to get the new amount of tomato sauce. If you want to decrease the recipe to make only half as many servings, you will have to multiply $\frac{1}{4}$ by $\frac{1}{2}$ to get the new amount. Here is a review of the steps to follow when multiplying fractions.

To multiply a fraction by another fraction:

Step 1: Write out the problem.

$$\frac{1}{4} \times \frac{1}{2} =$$

Step 2: Multiply numerator times numerator.

$$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$

Step 3: Multiply denominator times denominator.

$$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$$

Step 4: If necessary, reduce the answer to its lowest terms. In this case, $\frac{1}{8}$ is already in its lowest terms, so you do not need to reduce.

To multiply a fraction by a whole number:

Step 1: Write out the problem. When you do, write the whole

$$\frac{1}{4} \times 2 \rightarrow \frac{1}{4} \times \frac{2}{1}$$

Step 2: Multiply numerator times numerator and denominator times denominator.

$$\frac{1}{4} \times \frac{2}{1} = \frac{2}{4}$$

Step 3: If necessary, reduce the answer to its lowest terms.

$$\frac{1}{4} \times \frac{2}{1} = \frac{2}{4} = \frac{1}{2}$$

Step 4: This can also be written as follows: $\left(\frac{1}{4}\right) \left(\frac{2}{1}\right) = \frac{1}{2}$

Practice Your Skills

Solve the following problems. Show your work in the space provided.

1. $\frac{3}{4} \times \frac{1}{3} =$

2. $\frac{1}{3} \times \frac{1}{2} =$

Continued on next page

Math Skill Sheet D: Multiplying Fractions (continued)

3. $\frac{1}{2} \times 4 =$

4. $\frac{2}{3} \times \frac{3}{4} =$

5. $\frac{1}{2} \times 3 =$

6. $\frac{1}{4} \times \frac{3}{8} =$

7. $\frac{2}{5} \times 6 =$

8. $\frac{3}{7} \times \frac{2}{3} =$

9. $\frac{4}{6} \times \frac{1}{4} =$

10. $\frac{5}{9} \times 2 =$

11. $\frac{6}{7} \times \frac{1}{5} =$

12. $\frac{7}{5} \times \frac{6}{7} =$

13. $\frac{8}{12} \times \frac{1}{3} =$

14. $\frac{9}{11} \times \frac{2}{4} =$

15. $\frac{10}{16} \times 4 =$

16. $3 \times \frac{2}{3} =$

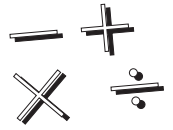
17. $\frac{7}{8} \times \frac{1}{7} =$

18. $\frac{3}{5} \times 3 =$

19. $\frac{12}{13} \times \frac{1}{6} =$

20. $\frac{8}{9} \times \frac{6}{3} =$

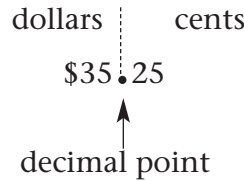
Math Skill Sheet E



Understanding Decimals

Vocabulary: decimal, place value

A *decimal* is a numeral that includes a decimal point. One common use for decimals is to express amounts of money. The decimal point separates the dollars from the cents, like this:



Writing amounts of money is not the only way decimals can be used. A decimal is just another way to express a fraction or a mixed number. For example, the fraction one-tenth can be written in decimal form as 0.1 (read as “zero point one”). The decimal 2.18 represents $2\frac{18}{100}$.

Decimals use *place value* to express fractions and mixed numbers. Place value means that the value of each digit in a numeral depends on its position. For example, the numeral 5,762.483 has seven digits. Each digit has a different place value. Note: after the decimal point “th” is added to the name of the numeral.



The digit 5 is in the thousands place, so it represents five thousand. The digit 8 is in the hundredths place, so it represents $\frac{8}{100}$.

Here are more basic facts about decimals:

- Digits to the left of the decimal point represent whole numbers. Digits to the right of the decimal point represent fractions.
- There can be any number of digits on each side of the decimal point. Each position has a value 10 times greater than the position to its right and 10 times smaller than the position to its left.
- Adding zeros to the right of the last digit in a decimal does not change its value:

$$0.2 = 0.20 = 0.200$$

You can think of these decimals in fraction form as:

$$\frac{2}{10} = \frac{20}{100} = \frac{200}{1000}$$

Math Skill Sheet E: Understanding Decimals (continued)

Practice Your Skills

1. Write as a numeral: Two dollars and twenty cents. _____

2. Write the following numerals out as words:

a. 8.37 _____

b. 10.18 _____

c. 6.56 _____

d. 5.06 _____

3. Write each of the following as a fraction:

a. 0.75 _____

b. 0.21 _____

c. 0.46 _____

d. 0.18 _____

e. 0.86 _____

4. Write each of the following as a decimal:

a. $\frac{68}{100}$ _____

b. $\frac{72}{100}$ _____

c. $\frac{54}{100}$ _____

d. $\frac{12}{100}$ _____

e. $\frac{34}{100}$ _____

5. Circle the digit in the hundredths place for each of the following:

a. 25.893

c. 296.871

b. 18.3284

d. 46.72983

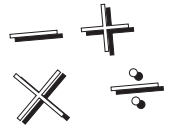
6. Circle the digit in the tenths place for each of the following:

a. 22.3284

b. 202.718

c. 64.38927

Math Skill Sheet F



Rounding Off Decimals

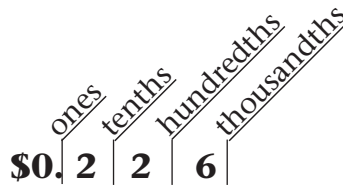
When you work with decimals, you need to know how to round them off. For example, suppose you want to know how much sales tax you will have to pay on an item. You could use a calculator to multiply the price of the item by the tax rate. If the price is \$3.78 and the tax rate is 6%:

$$\$3.78 \times .06 = \$0.226$$

But how much is \$0.226? It is more than 22 cents, but less than 23 cents. Since a penny is the smallest amount of money you can use, it is impossible to pay exactly \$0.226 tax. You will have to round off the amount.

Step 1: Decide how many decimal places you want to round off to.

Since you want to know the sales tax to the nearest cent, that means you will round off to the hundredths place.



Step 2: Look at the digit to the *right* of the decimal place to which you want to round off. Since you want to round to the hundredths place, look at the digit in the thousandths place.



Step 3: If the digit is *less than 5*, round down. If the digit is *5 or more*, round up.

Since 6 is more than 5, round up to \$0.23. You will pay 23 cents tax.

Here are more examples:

$$\$4.64\textcircled{0}37$$

Round down to \$4.64.

$$\$1.58\textcircled{5}$$

Round up to \$1.59.

$$\$0.92\textcircled{1}9$$

Round down to \$0.92.

Math Skill Sheet F: Rounding Off Decimals (continued)**Practice Your Skills**

Round each amount to the nearest cent. Put the answer in the blank.

1. \$4.929 _____ 2. \$0.874 _____ 3. \$1.4454 _____

4. \$3.6824 _____ 5. \$5.997 _____ 6. \$2.12671 _____

7. \$0.08926 _____ 8. \$1.86219 _____ 9. \$3.2261 _____

10. \$31.2762 _____ 11. \$9.98216 _____ 12. \$5.892 _____

13. \$15.3291 _____ 14. \$100.236 _____ 15. \$98.2228 _____

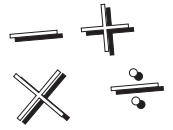
16. \$11.6295 _____ 17. \$22.9652 _____ 18. \$4.8271 _____

19. \$19.2551 _____ 20. \$45.486 _____ 21. \$33.420 _____

22. \$9.016 _____ 23. \$6.2981 _____ 24. \$7.005 _____

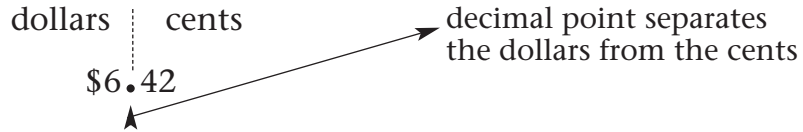
25. \$2.8787 _____

Math Skill Sheet G



Adding with Decimals

Adding numbers that contain decimal points is a useful skill. For example, it can come in very handy when you shop. As you select items, you can add up their prices. Doing this will help you make sure you don't spend more than you planned. Here is a quick review of how to add numbers that contain a decimal point, such as amounts of money.



Suppose you want to add the prices of the foods you are buying: \$6.42 for ground beef, \$.99 for onions, and \$2.75 for tomatoes.

Step 1: List the prices to be added. \$6.42
 Be sure to line up the decimal points. .99
+2.75

Step 2: Place a decimal point in the same position on the answer line. _____ → .

Step 3: Add the columns of numbers, starting at the right.
 $2 + 9 + 5 = 16$
 Write 6 on the answer line. Carry the 1 over to the center column of numbers.

$\begin{array}{r} 1 \\ \$6.42 \\ .99 \\ +2.75 \\ \hline .6 \end{array}$

Step 4: Add the center column.
 $1 + 4 + 9 + 7 = 21$
 Write 1 on the answer line. Carry the 2 over to the left column of numbers.

$\begin{array}{r} 21 \\ \$6.42 \\ .99 \\ +2.75 \\ \hline .16 \end{array}$

Step 5: Add the left column.
 $2 + 6 + 2 = 10$
 Write 10 in the answer space to the left of the decimal point.

$\begin{array}{r} 21 \\ \$6.42 \\ .99 \\ +2.75 \\ \hline 10.16 \end{array}$

The total for meat, onions, and tomatoes is \$10.16.

Practice Your Skills

Solve the following problems. Show your work in the space provided. Circle your answer.

- If you buy cereal for \$3.57 and milk for \$1.39, what is the total for these items?

Math Skill Sheet G: Adding with Decimals (continued)

2. Add the following prices: \$4.59, \$0.82, \$1.19, and \$2.80.

3. Tom went to the store to buy ice cream and toppings. The ice cream cost \$2.37, the chocolate syrup cost \$1.37 and the marshmallow crème cost \$0.99. How much was the total bill?

4. Add the following amounts together: \$2.40, \$3.98 and \$6.42.

5. Orange juice costs \$4.99 per gallon and cola costs \$0.99 for a 2-liter bottle. There is a \$0.10 deposit on the cola bottle. What is the total cost?

6. Kelley wanted to make some sandwiches. The bread cost \$1.29, the peanut butter cost \$1.99, the jelly cost \$1.79, and the bananas cost \$0.68. How much was the total cost of the sandwich ingredients?

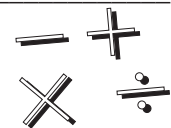
7. The cost of a spaghetti dinner for four people included \$0.69 for the pasta, \$1.89 for the sauce, \$2.86 for the cheese, \$2.99 for a bag of mixed green salad, \$3.49 for a bottle of Italian dressing, and \$2.63 for the bread. What was the total cost of the dinner?

8. Add the following amounts: $\$1.99 + \$1.99 + \$0.59 + \3.69 .

9. Add the costs for the following items: $\$5.82 + \$6.21 + \$2.49 + \0.15 . The tax for these items is \$1.8629. What is the total cost?

10. Lauren wanted to make brownies. She had \$8.50. The ingredients cost \$0.69, \$1.29, \$2.77, \$3.11, and \$0.59. Did she have enough money to buy the frosting that cost \$1.79?

Math Skill Sheet H



Subtracting with Decimals

Vocabulary: difference

Subtracting numbers that contain decimal points is a basic math skill. It can be useful when you shop. For example, you can subtract the cost of your groceries from the amount of money you have with you. The answer, or the *difference*, tells you how much money you will have left. Suppose the items you are buying at the grocery store total \$64.32. You have brought \$76.25 with you. You want to know how much you will have left after you pay for the groceries.

Step 1: List the amount of money you are starting with at the top.
List the amount you are taking away below.
Be sure to line up the decimal points.
Place a decimal point in the same position on the answer line.

$$\begin{array}{r} \$76.25 \\ -64.32 \\ \hline . \end{array}$$

Step 2: Subtract the columns of numbers, starting at the right:

$$5 - 2 = 3$$

Write 3 on the answer line.

$$\begin{array}{r} \$76.25 \\ -64.32 \\ \hline . 3 \end{array}$$

Step 3: Now look at the next column. Notice the top number is smaller than the bottom number. You will have to borrow from the ones place to give you more in the tenths place.

$$\begin{array}{r} \$76\textcircled{2}5 \\ -64.32 \\ \hline . 3 \end{array}$$

Step 4: Change the 6 in the ones place to a 5. Change the 2 in the tenths place to a 12.

6 ones and 2 tenths is the same as 5 ones and 12 tenths.

$$\begin{array}{r} \$7\overset{5}{\cancel{6}}\overset{1}{2}5 \\ -64.32 \\ \hline . 3 \end{array}$$

Step 5: Now you can subtract:

$$12 - 3 = 9$$

Write 9 on the answer line.

$$\begin{array}{r} \$7\overset{5}{\cancel{6}}\overset{1}{2}5 \\ -64.32 \\ \hline .93 \end{array}$$

Step 6: Continue to subtract the rest of the columns.

The difference between the amount you have to spend and the total amount of items is \$11.93.

$$\begin{array}{r} \$7\overset{5}{\cancel{6}}\overset{1}{2}5 \\ -64.32 \\ \hline 11.93 \end{array}$$

Practice Your Skills

Solve the following problems. Show your work in the space provided. Circle your answer.

1. You budgeted \$160.00 for groceries this week. You spent \$156.71. Find the difference.

Continued on next page

Math Skill Sheet H: Subtracting with Decimals (continued)

2. Your groceries total \$17.68. You hand the clerk a \$20 bill. How much change should the clerk give you?

3. Your groceries cost \$89.19. You pay for the groceries with a \$100 bill. How much change do you get back?

4. You earned \$25.00 from your babysitting job on a Saturday afternoon. Afterwards, you went to the mall with your friends and decided to have a snack. The large nachos and soda you ordered cost \$9.59. How much money will you get back?

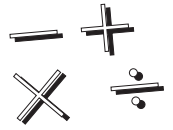
5. Al saved \$40.00 for a pizza party. The pizza cost was \$18.22. How much money did he have left? Al then decided to buy a dozen individual bottles of fruit juice for a cost of \$10.68. How much money did he take home after paying the bill for the pizza and fruit juice?

6. Lucinda's wages for selling food at the school concession stand were \$32.82. She needed to give her friend \$10.00 for helping her out when things got busy. How much did Lucinda actually earn?

7. Dinner at a casual-dining restaurant costs \$37.66. Anu had \$50.00. How much change did he get in return?

8. The school fundraiser earned \$400.23. The supplies for the fundraiser cost \$72.02. How much did the school actually make?

Math Skill Sheet I



Multiplying with Decimals

Numbers that contain decimal points can be multiplied just like whole numbers. The only difference is that when you finish multiplying, you need to find the right place for the decimal point in the answer.

The number of decimal places in the answer is the same as the total number of decimal places in the two numbers you are multiplying.

Suppose you want to buy 12 large packages of frozen vegetables. Each package costs \$1.69. To find the total cost of 12 packages, you would multiply \$1.69 X 12.

Step 1: Write out the problem. Do not place the decimal on the answer line yet.
To begin, you will multiply 2 times each digit in \$1.69, working from right to left.

$$\begin{array}{r} \$1.69 \\ \times 12 \\ \hline \end{array}$$

Step 2: $2 \times 9 = 18$
Write 8 on the answer line. Line it up under the 2.
The 1 will be added to the next product.
To show this, carry the 1. This means you write 1 above the 6 to remind you to add 1 to 2×6 .

$$\begin{array}{r} \\ \$1.6\overset{1}{9} \\ \times 1\overset{1}{2} \\ \hline 8 \end{array}$$

Step 3: $(2 \times 6) + 1 = 13$
Place 3 on the answer line, next to the 8.
Carry the 1.

$$\begin{array}{r} \\ \$1.\overset{1}{6}\overset{1}{9} \\ \times 1\overset{1}{2} \\ \hline 38 \end{array}$$

Step 4: $(2 \times 1) + 1 = 3$
Write 3 on the answer line.

$$\begin{array}{r} \\ \$\overset{1}{1}.\overset{1}{6}\overset{1}{9} \\ \times 1\overset{1}{2} \\ \hline 338 \end{array}$$

Step 5: Now you are ready to multiply the next digit, 1, times each digit in \$1.69.
Cross out the numbers you carried before.

$$\begin{array}{r} \cancel{11} \\ \$\overset{1}{1}.\overset{1}{6}\overset{1}{9} \\ \times 1\overset{1}{2} \\ \hline 338 \end{array}$$

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Continued on next page

Math Skill Sheet I: Multiplying with Decimals (continued)

Step 6: $1 \times 9 = 9$.

Place the 9 on a new answer line.

Since you are multiplying by the 1, line up the 9 under the 1.

$$\begin{array}{r} +1 \\ \$1.6\textcircled{9} \\ \times \textcircled{1}2 \\ \hline 3\ 38 \\ 9 \end{array}$$

Step 7: $1 \times 6 = 6$

Write 6 on the answer line next to the 9.

$$\begin{array}{r} +1 \\ \$1.\textcircled{6}9 \\ \times \textcircled{1}2 \\ \hline 3\ 38 \\ 6\ 9 \end{array}$$

Step 8: $1 \times 1 = 1$

Write 1 on the answer line next to the 6.

$$\begin{array}{r} +1 \\ \$\textcircled{1}.\textcircled{6}9 \\ \times \textcircled{1}2 \\ \hline 3\ 38 \\ 16\ 9 \end{array}$$

Step 9: Add each column of numbers in the two answer lines.

$$\begin{array}{r} +1 \\ \$1.69 \\ \times 12 \\ \hline 3\ 38 \\ +16\ 9 \\ \hline 20\ 28 \end{array}$$

Step 10: Now find where to put the decimal point.

- 2 decimal places in \$1.69
- +0 decimal places in 12
- 2 decimal places in the answer

Count two places to the left and insert the decimal point.

$$\begin{array}{r} +1 \\ \$1.69 \\ \times 12 \\ \hline 3\ 38 \\ +16\ 9 \\ \hline 20.28 \\ \uparrow \uparrow \end{array}$$

The total cost of 12 packages of vegetables costing \$1.69 each is \$20.28.

Practice Your Skills

Solve the following problems. Show your work in the space provided. Circle your answer.

1. If you multiply 3.42×1.5 , how many decimal places will the answer have? How do you know?

2. What is $704 \times .28$?

Math Skill Sheet I: Multiplying with Decimals (continued)

3. If popcorn at the ball park costs \$2.75 and you want two bags, how much will you have to pay?
4. If one pound of beef costs \$2.59, how much would 6 pounds cost?
5. Multiply the following decimals. Show the correct number of decimal places.
 - a. $8.16 \times 1.38 =$
 - b. $8.18 \times 2.0 =$
 - c. $2.7 \times 5.14 =$
6. Orange juice costs \$3.99 per gallon. The team needs 4 gallons of juice. What is the total cost to the team?
7. The soccer team needs 12-16 oz. boxes of spaghetti for the team dinner. Each box costs \$0.69. What is the total cost for the spaghetti?
8. The salad bar at a local supermarket is \$3.89 per pound. Your family eats 4.5 pounds of salad. What is the total bill for the salad? Round off to the nearest cent.
9. A cookie recipe calls for 15 small chocolate bars. Each bar costs \$0.39. What is the total cost of chocolate bars for the recipe?
10. Your fruit salad recipe calls for 2 pounds of bananas and 2 pounds of fresh strawberries. Bananas currently sell for \$0.89 per pound and strawberries for \$3.99 per pound. How much will you spend to make a 4-pound fruit salad?

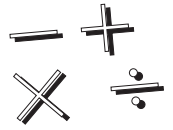
Math Skill Sheet I: Multiplying with Decimals (continued)

- 11.** The math club is selling cookies for a fundraiser. Each box of cookies costs \$3.25. In order to meet their target goal, the club needs to sell 18 more boxes of cookies. How much will the club make on 18 boxes of cookies?

- 12.** The drama club needs 36 bottles of water for use during play practice. Each bottle costs \$0.79. How much will the club spend on the water?

Math Skill Sheet J

Dividing a Decimal by a Whole Number



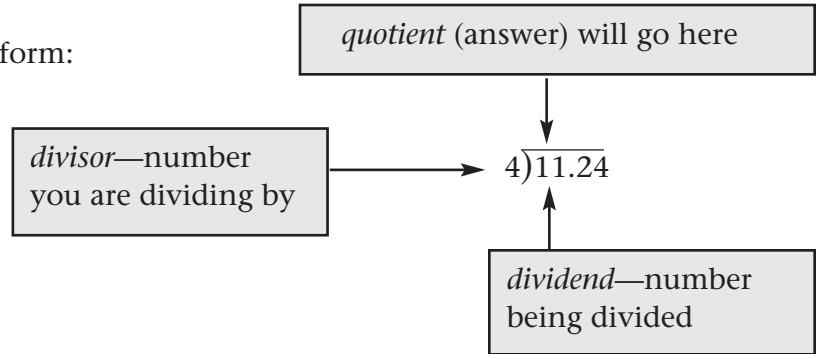
Vocabulary: divisor, dividend, quotient

Suppose you and three friends order a pizza and want to split the cost four ways.

$$\$11.24 \div 4 = ???$$

To solve this problem, you need to know how to divide a decimal number (11.24) by a whole number (4).

Step 1: Write the problem in this form:



Step 2: Place a decimal point on the answer line, right above the decimal point in the dividend.

$$4 \overline{)11.24}^{\cdot}$$

Step 3: Four will go into 11 two times. Place 2 above the 1 in 11.

$$4 \overline{)11.24}^{\cdot} \begin{array}{l} 2. \\ \hline \end{array}$$

Step 4: Multiply 2 (in quotient) by 4 (divisor). The answer is 8. Place 8 under 11.

$$4 \overline{)11.24}^{\cdot} \begin{array}{l} 2. \\ \hline 8 \\ \hline \end{array}$$

Step 5: Subtract. When you subtract, make sure that the remainder is less than the divisor.
 $11 - 8 = 3$

$$4 \overline{)11.24}^{\cdot} \begin{array}{l} 2. \\ \hline 8 \\ \hline -8 \\ \hline 3 \end{array}$$

Step 6: Bring down the next digit in the dividend, 2. Four will go into 32 eight times. Place an 8 on the answer line.

$$4 \overline{)11.24}^{\cdot} \begin{array}{l} 2.8 \\ \hline 8 \\ \hline -8 \\ \hline 32 \end{array}$$

Continued on next page

Math Skill Sheet J: Dividing a Decimal by a Whole Number (continued)

Step 7: Multiply 8 X 4. Subtract.

$$\begin{array}{r} 2.8 \\ 4 \overline{)11.24} \\ \underline{-8} \\ 32 \\ \underline{-32} \\ 0 \end{array}$$

Step 8: Bring down the next digit in the dividend, 4, and place it after the 0.

$$\begin{array}{r} 2.8 \\ 4 \overline{)11.24} \\ \underline{-8} \\ 32 \\ \underline{-32} \\ 04 \end{array}$$

Step 9: Four will go into 4 once. Place a 1 in the answer line, just above the 4 in the dividend. Multiply 1 X 4 and subtract. Since there are no more numbers to bring down, and the remainder is 0, you are finished dividing.

$$\begin{array}{r} 2.81 \\ 4 \overline{)11.24} \\ \underline{-8} \\ 32 \\ \underline{-32} \\ 04 \\ \underline{-4} \\ 0 \end{array}$$

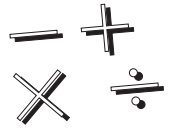
When you divide the \$11.24 cost of the pizza four ways, you each pay \$2.81.

Practice Your Skills

Use a separate sheet of paper to solve the following problems. Show your work.

1. What is $\$15.27 \div 3$?
2. If your total grocery bill is \$106.50 and you and four other people are splitting it evenly, how much does each person pay?
3. You and a friend earn \$40.60 helping a neighbor with household chores. You divide the money evenly. How much do you each get?
4. You bought a gift for your mother’s birthday with your 3 siblings. The gift cost \$73.00. How much did each person spend?
5. The chess club bought sub sandwiches for the team practice. The sandwiches cost \$48.00. There are 7 people on the team. How much did each person spend?

Math Skill Sheet K



Dividing by a Decimal

At times, you will want to divide by a number that includes a decimal point. For example, suppose the pep club is selling fruit punch at a fundraising event for 75¢ per glass. Afterwards, you count the money and find you made \$88.50. You want to know how many glasses of punch you sold so that you can plan for the next event. How would you divide \$88.50 by \$0.75?

Step 1: The divisor is .75. $.75 \overline{)88.50}$
 The dividend is 88.50.
 Do not place the decimal point on the answer line yet.

Step 2: The divisor must be a whole number. $.75 \overline{)88.50}$
 So, move the decimal point over 2 places to the right.

Step 3: Now move the decimal point in the dividend the same $.75 \overline{)88.50}^{\wedge}$
 number of places to the right and place a caret at this point.

Step 4: Place the decimal point on the answer line directly above $75 \overline{)8850.}$
 the caret in its new place in the dividend. What you have
 done is multiplied both the divisor and the dividend by the
 same number. In this case, since you moved the decimal
 point over two places, you have multiplied by 100.

Step 5: Divide as usual.

$$\begin{array}{r}
 118. \\
 75 \overline{)8850.} \\
 \underline{-75} \\
 135 \\
 \underline{-75} \\
 600 \\
 \underline{-600} \\
 0
 \end{array}$$

 The club sold 118 glasses of fruit punch.

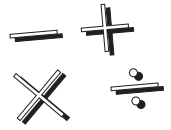
Math Skill Sheet K: Dividing by a Decimal (continued)**Practice Your Skills**

Solve the following problems. Round off to the correct decimal place. Show your work in the space provided.

1. Divide:
 - a. $60 \div 7.5$
 - b. $15.4 \div 2.8$
 - c. $3.9 \div 0.08$
2. A packaged dinner weighs 11.5 ounces and costs \$2.07. What is the price per ounce?
3. $12 \div 3.5 =$ _____
4. $16 \div 9.6 =$ _____
5. $12.2 \div 0.3 =$ _____
6. $13.8 \div 0.16 =$ _____
7. $37 \div 5.2 =$ _____
8. One pound of bananas costs \$0.69 pounds. There are 6 bananas per pound. How much does 1 banana cost?
9. A lasagna recipe uses 2.5 pounds of meat for 12 servings. How many ounces of meat will there be in one serving? (Note: First determine the total number of ounces of meat in the recipe).
10. The fish for a fish bake weighs 122.8 ounces (7.68 pounds) before cooking. Each serving is 3.5 ounces. How many people can be served?

Math Skill Sheet L

Converting a Fraction to a Decimal



Knowing how to convert a fraction to a decimal can help you solve math problems. For instance, you may have to solve a problem that contains both a fraction (such as a measurement) and a decimal (such as an amount of money). The problem will be easier to solve if both numbers are expressed as decimals. Another reason for changing a fraction to a decimal is so that you can use a calculator. Numbers that you enter on a calculator must be in decimal form.

You can convert any fraction to a decimal. Just divide the numerator by the denominator.

$$\frac{3}{8} = 3 \div 8$$

$$\begin{array}{r} .375 \\ 8 \overline{) 3.000} \\ \underline{-24} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

Suppose you pay \$1.50 for a bag of flour that contains $16\frac{2}{3}$ cups of flour. How would you figure out the price per cup?

Step 1: Write the problem as it is stated. $1.50 \div 16\frac{2}{3}$

Step 2: Change $\frac{2}{3}$ to a decimal by dividing.

$$\begin{array}{r} .666 \rightarrow \text{Round off to } 0.67 \\ 3 \overline{) 2.000} \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 2 \end{array}$$

Step 3: Rewrite the problem using the decimal form. $1.50 \div 16.67$

Now that both numbers are in decimal form, you are ready to divide.

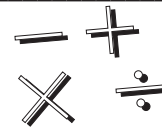
Practice Your Skills

Convert each fraction or mixed number to decimal form. (Round off to three decimal places, if necessary.) Use a separate sheet of paper and show your work.

- | | | | | |
|-----------------------|---------------------|---------------------|---------------------|-----------------------|
| 1. $\frac{2}{5}$ | 2. $6\frac{3}{4}$ | 3. $\frac{1}{6}$ | 4. $3\frac{1}{4}$ | 5. $\frac{5}{2}$ |
| 6. $\frac{3}{13}$ | 7. $1\frac{1}{12}$ | 8. $\frac{12}{125}$ | 9. $4\frac{5}{8}$ | 10. $\frac{13}{20}$ |
| 11. $15\frac{18}{19}$ | 12. $4\frac{22}{6}$ | 13. $\frac{7}{3}$ | 14. $12\frac{3}{6}$ | 15. $10\frac{31}{12}$ |

Math Skill Sheet M

Understanding Percent



Vocabulary: percent

The symbol “%” means “percent.” Understanding percent is an important concept for you as a consumer. For example, when you pay for purchases (6% sales tax), buy items on sale (20% off), or plan a budget (15% of income is for food), you need to know what “%” represents.

Percent means “out of 100.” You can change a percentage to a fraction just by writing the number over 100:

$$25\% = \frac{25}{100}$$

$$77\% = \frac{77}{100}$$

$$12\% = \frac{12}{100}$$

Percentages can also be expressed as decimals. To write a percentage as a decimal, remove the % sign and divide by 100:

$$33\% = 0.33 \text{ (because } 33 \div 100 = 0.33\text{)}$$

To change a decimal into a percentage, multiply by 100 and add the percent sign:

$$0.5 = 50\% \text{ (because } 0.5 \times 100 = 50\text{)}$$

There are two ways to change a fraction, such as $\frac{2}{5}$, into a percentage.

Method 1

Change the fraction into an equivalent fraction with 100 as the denominator.

$$\frac{2}{5} = \frac{2 \times 20}{5 \times 20} = \frac{40}{100}$$

Then write the new fraction as a percentage.

$$\frac{40}{100} = 40\%$$

Method 2

Convert the fraction to a decimal by dividing the numerator by the denominator.

$$\begin{array}{r} 0.4 \\ 5 \overline{)2.0} \end{array}$$

Then convert the decimal to a percentage by multiplying by 100.

$$0.4 \times 100 = 40\%$$

Solving Percent Problems

José and his family are eating out. His uncle says, “The bill came to \$24. José, could you please leave 15% of that amount as a tip?” How much should José leave?

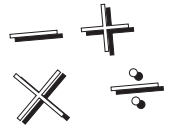
When you work with percentages, think of the word “of” as another word for “times or multiplication.” To solve this problem, change 15% to a decimal, then multiply.

$$15\% \text{ of } \$24 \rightarrow .15 \times 24 = \$ 3.60 \text{ tip}$$

Practice Your Skills

1. Write in fraction form: **a.** 28% = _____ **b.** 86% = _____ **c.** 14% = _____
2. Write as a percent: **a.** $\frac{3}{8}$ = _____ **b.** $\frac{12}{22}$ = _____ **c.** 0.73 = _____
3. Write in decimal form: **a.** 16% = _____ **b.** 53% = _____ **c.** 62% = _____
4. How much is 33% of 24? _____; What is 12% of 82? _____

Math Skill Sheet N



Reading a Table

Helpful information is often presented in the form of a table (a chart with rows and columns). For example, many fast food restaurants give out information about the nutrition of their food products. You might find a nutrition table on a poster or in a pamphlet at the restaurant. You can use this information to make food choices.

Below is a nutrition guide from a fictitious fast food restaurant called “Billy Burgers.” Look at the table carefully, then read on.

Nutrition Guide for Billy Burgers

Food Item	Calories	Protein (g)	Fat (g)
Hamburger	350	24	16
Baked Potato.....	250	6	2
French Fries	227	3	13
Garden Salad	102	7	5
Chef’s Salad	231	21	14

Notice that this table has four columns of information, each with its own heading: food item, calories, protein, and fat. The “(g)” next to “Protein” and “Fat” means that the amounts in these columns are given in grams.

Suppose you want to know how much fat is in a Billy Burgers hamburger. First read down the “Food Item” column until you find “Hamburger.” Then follow the row straight across until you find the number under the “Fat” column. As you can see, the hamburger at Billy Burgers has 16 grams of fat.

Practice Your Skills

Use the Billy Burgers nutrition guide to help you answer the following questions.

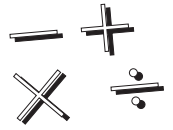
1. How many calories are in a garden salad? _____
2. Which food item has 13 grams of fat? _____
3. Which has more protein, a hamburger or a chef’s salad? _____

Use basic math skills and the information in the Billy Burgers nutrition guide to solve the following problems. Show your work.

4. If you eat a baked potato and a chef’s salad, what is the total number of calories for the meal?

5. Suppose you decide to have a hamburger. What other items could you choose and still total less than 25 grams of fat for the meal?

Math Skill Sheet 0



Reading a Circle Graph

Vocabulary: graph, sector

Often, facts are easier to understand when they are presented as a graph rather than in words and numbers alone. A *graph* is a drawing used to show information. It can help you see at a glance how quantities relate to one another.

At the right is an example of a circle graph, sometimes called a “pie chart.” It is used to compare parts of a whole. The circle represents the whole quantity—in this case, all of the money the Smiths spend on food.

The circle is divided into parts, or *sectors*, just like pieces of a pie. Each sector represents part of the money spent. The labels tell you what each sector stands for. The size of each sector depends on how much of the whole it represents.

In this case, the graph does not tell you exactly how much money was spent in each category. Even so, you can use the graph to make comparisons. It is easy to see at a glance that groceries make up most of the Smith’s food purchases. In fact, more than half of the money they spend on food goes to buy groceries.

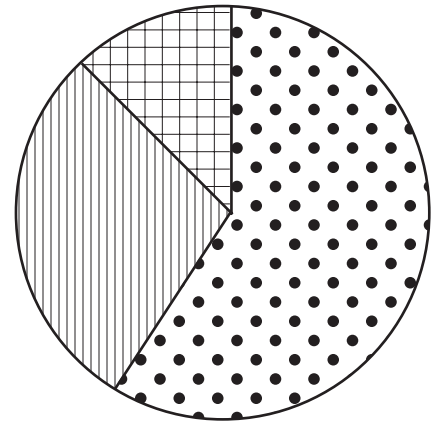
Most circle graphs do include numbers. Each sector is labeled to show you how much, or what percentage, of the whole it represents. At the right is the same graph shown above, this time with the percentages labeled. A circle graph does not exceed 100%.




Now you can see that the amount spent on groceries is 60% of the total. You can use this information to solve problems about the Smith’s food budget.

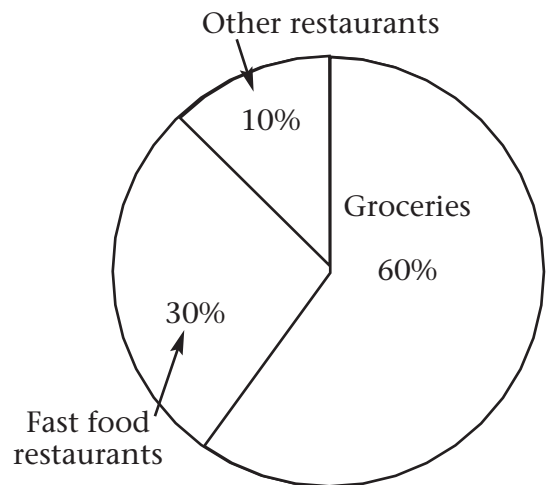
Example: Suppose the total the Smiths spent on food was \$250. How much was spent on groceries?

$$60\% \text{ of } \$250 = 0.6 \times 250 = \$150$$

The Smith’s Food Purchases



-  Groceries
-  Fast food restaurants
-  Other restaurants



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Continued on next page

Math Skill Sheet 0: Reading a Circle Graph (continued)

Practice Your Skills

1. Refer to the circle graph "The Smith's Food Purchases" on the previous page.
 - a. How does the size of the "Groceries" sector compare to the size of the "Fast food restaurants" sector? Why?

- b. If the Smiths spent \$200 on food, how much was spent at fast food restaurants?

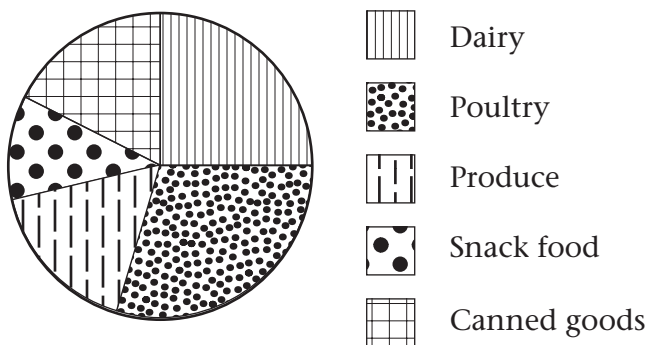
2. Refer to the circle graph "Grocery Spending" below.

- a. In which category was the most money spent? How do you know?

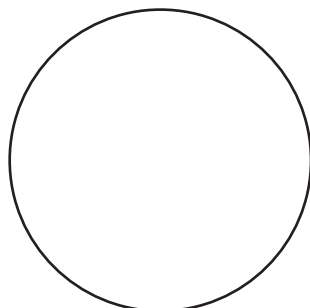
- b. In which category was the least money spent? How do you know?

- c. Was more money spent on produce or dairy products? How do you know?

Grocery Spending

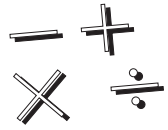


3. Draw a circle graph showing that 75% of students buy lunch in the school cafeteria and 25% bring a lunch from home.



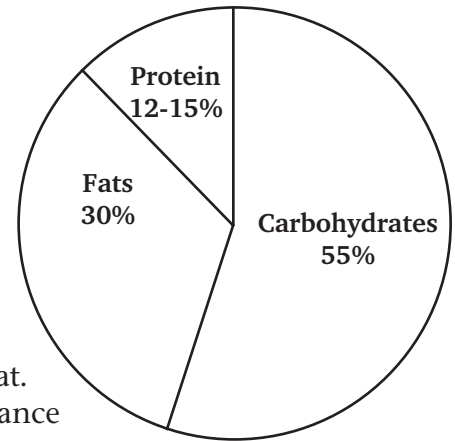
Application 1

Analyzing Your Diet



Health experts recommend that :

- At least 55% of all the calories you take in should come from carbohydrates.
- No more than 30% of all the calories you take in should come from fat.
- About 12-15% of all the calories you take in should come from protein.



Not every food you eat, or even every meal, has to fit these guidelines perfectly. But over a period of several days, the foods you eat should balance out.

For example, you may eat some foods that have more than 30% fat. But if you also eat foods that have less than 30% fat, you can balance your overall diet so that it fits within the guidelines.

Figuring Individual Needs

Notice that the guidelines give percentages, not specific amounts of carbohydrate, protein, or fat. That's because people need different amounts of calories and nutrients.

How many calories do you need?

- 2200 calories a day is about the right average for most teenage girls.
- 2800 calories a day is about the right average for most teenage boys.

You may need more or fewer calories, depending on how active you are and whether you are maintaining a healthy weight.

Example 1: Justin is 14 years old and moderately active. He needs about 2800 calories a day. How many of those calories should come from carbohydrates?

$$55\% \text{ of } 2800 = .55 \times 2800 = 1540 \text{ calories from carbohydrates}$$

Example 2: Jana is 15 years old and is active on the track team at her school. She needs about 2500 calories per day because of her activity level. How many of those calories should come from protein?

$$15\% \text{ of } 2500 = .15 \times 2500 = 375 \text{ calories from protein}$$

How Many Calories in a Gram?

You can use simple math to convert calories of a nutrient to grams of a nutrient, or convert grams of a nutrient to calories of a nutrient. Just remember:

- 1 gram of carbohydrate or protein has 4 calories
- 1 gram of fat has 9 calories

Continued on next page

Application 1: Analyzing Your Diet (continued)

To find the number of grams for carbohydrate or protein, divide the number of calories by 4. To find the number of grams for fat, divide the number of calories by 9. To find the number of calories, multiply the number of grams by 4 or 9.

Example 3: Justin now knows he needs 1540 calories a day from carbohydrates. How many grams of carbohydrates does he need?

$$1540 \text{ calories} \div 4 \text{ calories per gram} = 385 \text{ grams of carbohydrates}$$

Checking Your Food Choices

Sara keeps track of her food choices at least once a week. She wants to make sure she is sticking to her weight loss plan. She needs about 1800 calories a day, with less than 30% of those calories from fat.

Here’s how Sara checks her food choices. You can use the same method. Remember, however, that your calorie needs may be different from Sara’s.

Step 1: For a day or two, keep a record of everything you eat and the amounts.

Step 2: For each food, write down the number of calories and the number of grams of fat. Sara gets some of this information from food labels. She also uses a reference book from the library and a nutrient chart that her foods and nutrition teacher gave her.

Sara’s Food Record		
Food	Calories	Fat Grams
Raisin Bran Cereal	190	3
Low-fat milk	102	2.5
Banana	105	0
Chicken breast sandwich	280	5
Carrots and broccoli (raw)	40	0
Reduced-fat milk	121	5

Step 3: Add to find the total number of calories and grams of fat in all the foods listed. Today, Sara’s total came to 1832 calories and 57 grams of fat.

Step 4: Convert grams of fat to calories from fat.
 $57 \text{ grams} \times 9 \text{ calories per gram} = 513 \text{ calories from fat}$

Step 5: Express the number of calories from fat as a percentage of total calories. Out of 1832 total calories, 513 came from fat. Sara can write this as a fraction: $\frac{513}{1832}$
 Then she can convert the fraction to a percentage by dividing:

$$513 \div 1832 \approx 0.28 = 28\%$$

Sara came very close to her goal of 1800 calories. She did well to limit her fat to 28% of her total calories.

You can follow the same steps to calculate the percentage of calories from carbohydrate or protein. However, remember that these nutrients have only 4 calories per gram, not 9.

To Sum Up

grams of fat $\times 9 \div$ total number of calories $\times 100 =$ % of calories from fat
 grams of carbohydrate $\times 4 \div$ total number of calories $\times 100 =$ % of calories from carbohydrate
 grams of protein $\times 4 \div$ total number of calories $\times 100 =$ % of calories from protein

Continued on next page

Application 1: Analyzing Your Diet (continued)

Practice Your Skills

Solve the following problems in the space provided. Show your work.

1. Jessica needs about 2200 calories a day. How many of those calories should come from carbohydrate? From fat? From protein?

2. How many calories are in 12 grams of carbohydrate?

3. How many grams of protein would supply 300 calories?

4. Find the percentage of calories from fat for the whole day:
 Breakfast: 715 calories, 20 grams of fat Dinner: 693 calories, 27 grams of fat
 Lunch: 844 calories, 34 grams of fat Snacks: 210 calories, 12 grams of fat

5. A recipe for Spicy Chicken lists 165 calories per serving, 5 grams of fat, 2 grams of carbohydrates, and 27 grams of protein.
 - a. What percentage of calories in Spicy Chicken comes from fat? _____
 - b. What percentage of calories in Spicy Chicken comes from protein? _____
 - c. What percentage of calories in Spicy Chicken comes from carbohydrate? _____

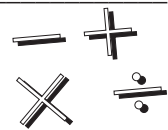
6. Ann and her father are on weight-reduction diets. Ann needs to eat 1200 calories per day. Her father needs to eat 1600 calories per day. Use the circle graph and formula on page 39 to find the answers to the following questions.
 - a. How many calories from carbohydrate will Ann need? _____
 - b. How many calories from fat will Ann need? _____
 - c. How many calories from protein will Ann's father need? _____
 - d. How many calories from carbohydrate will Ann's father need? _____

7. Find the number of fat grams in a 272-calorie meal. Use the circle graph and formula on page 39 as a guide. Circle your answer.

Application 1: Analyzing Your Diet (continued)

8. Find the number of grams of protein from a 522-calorie meal for a very active person. Circle your answer.
9. Find the number of grams of carbohydrate from a 381-calorie meal. Circle your answer.
10. For a typical day, keep a record of everything that you eat and drink. Be sure to write down each food, the calories from each food, the fat grams, grams of carbohydrate, and grams of protein. Use food labels and reference materials to help find these answers. Write your responses to the following in the space provided.
- a. What were your total calories for the day? _____
 - b. What were your total grams of fat for the day? _____
 - c. Determine your number of calories from fat as a percentage of your _____ total calories.
 - d. What were your total grams of carbohydrate for the day? _____
 - e. Determine your number of calories from carbohydrate as a percentage _____ of your total calories.
 - f. What were your total grams of protein for the day? _____
 - g. Determine your number of calories from protein as a percentage _____ of your total calories.
 - h. Using the circle graph on page 39 and your total calories for one day, determine the percentage of calories from fat, carbohydrate and protein that experts recommend you should have based on the calories consumed. Write your answers in the space provided. How do the percentages that you *should* have compare to your actual percentages?

Percent of fat _____ Percent of carbohydrate _____ Percent of protein _____

Application 2**The Dollars and Cents of Shopping**

Math skills can help you when you shop. Here are some examples of how to use math skills in common shopping situations.

Using Coupons

Suppose you have a coupon for 30¢ off the price of a 16-ounce box of whole wheat cereal. The cereal regularly sells for \$3.95. The store gives double value for coupons. What is the price of the cereal with the coupon?

First multiply by 2 to find the value of the coupon when it is doubled:

$$2 \times 30¢ = 60¢$$

Now subtract the coupon value from the price of the cereal. Before you subtract, remember to change 60¢ to \$0.60 so that both numbers are expressed in the same unit (dollars or cents).

$$\begin{aligned} \$3.95 - 0.60 &= \$3.35 \\ 395¢ - 60¢ &= 335¢ \text{ or } \$3.35 \end{aligned}$$

Multiple Items

If a number of items are the same price, you can use multiplication to find the total cost of the items. For example, if you were buying 4 cans of tomato soup at \$0.89 (89¢) each:

$$\$0.89 \times 4 = \$3.56$$

Now suppose the cans had been marked down on a special sale. The sign says “2 for \$1.” How much would four cans cost? Divide \$1 by 2 to find the price for each can:

$$\$1.00 \div 2 = \$0.50 \text{ (rounded off to the nearest cent)}$$

Now multiply by 4 to find the price for four cans:

$$\$0.50 \times 4 = \$2.00$$

Weighed Items

Bananas are 49¢ (\$.049) per pound. After you select the bananas you want, you weigh them on the nearby scale. If they weigh about $2\frac{1}{2}$ (2.5) pounds, how much will they cost?

$$\$0.49 \times 2.5 = \$1.23 \text{ (rounded off to the nearest cent)}$$

Sales Tax

Suppose you add the prices of the items you are buying and find that the total is \$47.32. If the sales tax on groceries in your area is 5%, what does the tax come to?

First convert 5% to a decimal. Since “percent” means “out of 100,” 5% means $\frac{5}{100}$ or 0.05. Now you can multiply the total price by 0.05 to find the amount of tax.

$$\$47.32 \times 0.05 = \$2.37 \text{ (rounded off to the nearest cent)}$$

To find the total you will have to pay, add the tax to the price of your items.

$$\$47.32 + 2.37 = \$49.69$$

Continued on next page

Application 2: The Dollars and Cents of Shopping (continued)**Discounts**

Sometimes items are sold at a discount. For example, a toaster that regularly sells for \$30 may have a tag that says “15% off regular price.” How much will you save? Multiply the original price by 0.15 (15% converted to decimal form).

$$\$30 \times 0.15 = \$4.50$$

To find the sale price of the toaster, subtract \$4.50 (the amount saved) from \$30 (the original price).

$$\$30.00 - 4.50 = \$25.50$$

Estimating

You may not always need an exact answer to a math problem. Sometimes an estimate, or an approximate answer, will do. To make an estimate, round off the numbers before you compute. Rounding the numbers makes them easier to work with. You may even be able to do the math “in your head.” The answer you get will not be exact, but it will be close.

Suppose you are heading into the checkout lane with three items. You remember you have about \$10 with you. Will you have enough cash to pay for the items?

\$1.89 → Round off to \$2.00

\$3.19 → Round off to \$3.00

\$2.45 → Round off to \$2.50

Think: $\$2 + \$3 = \$5$

Think: $\$5 + 2.50 = \7.50

It looks like you’ll have enough money and some to spare. Then find the exact sum.

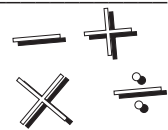
$$\$1.89 + \$3.19 + 2.45 = \$7.53$$

Learning to estimate is a beneficial skill and can help you spend your money wisely.

Practice Your Skills

Use a separate sheet of paper to solve the following problems. Show your work.

- Find the prices of each of the following:
 - An item for \$3.39 with a coupon for 75¢ off
 - 3 items at \$1.87 each
 - An item for \$2.34 with a coupon for 35¢ off; the store will double the coupon value
 - 4 pounds of apples at \$1.29 per pound
- What is the total cost of the items in A through D above?
- If the sales tax on items A through D is 6%, how much tax would you have to pay?
- What is the total cost of items A through D including 6% sales tax?
- A small appliance is on sale for 20% off the original price of \$29.95. What is the sale price?
- Suppose you select four items costing \$1.79, \$0.87, \$2.28, and \$1.04. Estimate the total by rounding to the nearest whole dollar. Then find the exact sum.

Application 3**Comparison Shopping**

Comparing prices when you shop can help you save money. Comparison shopping is easy if the items are the same size. For example, suppose a jar of Brand A spaghetti sauce costs \$1.39, while Brand B costs \$1.29. If the jars are the same size, you don't need to do any math to know that Brand B costs less.

However, what if the jars are two different sizes? In that case, you need to know the unit price for each jar. *Unit price* is the cost per ounce, pound, item, or other unit of measure. Many supermarkets include the unit price under the regular price on the store shelves. Using the unit price lets you make a fair comparison of items that are different sizes or quantities.

There are many ways to comparison shop. For example, you can compare unit prices of:

- Different brands.
- Different sizes or quantities of the same brand.
- Different forms of food.
- Items in different stores.

Computing Unit Price

Sometimes the unit price of an item is posted on the shelf. If not, you can compute the unit price yourself using the formula:

$$\text{price of the item} \div \text{number of units in the item} = \text{unit price}$$

Suppose you are comparing two different cans of pineapple to find which is the better buy.

- Step 1:** Decide what unit of measure to use for your comparison.
Always use the same unit of measure for both items. Since both cans of pineapple are marked in ounces, you decide to compare the price per ounce.
- Step 2:** Compute the unit price of the first item.
Use the formula shown above. You can use a calculator or do the math by hand.
The first can of pineapple weighs 8 ounces and costs 89 cents, so the formula is:
$$89¢ \div 8 \text{ ounces} = 11.13¢ \text{ per ounce}$$
- Step 3:** Compute the unit price of the second item.
The second can weighs 14 ounces and costs \$1.29.
$$\$1.29 \div 14 \text{ ounces} = 9.2¢ \text{ per ounce}$$
- Step 4:** Compare the unit prices.
The can that weighs 8 ounces costs 11.13¢ per ounce. The can that weighs 14 ounces costs 9.2¢ per ounce, so it is the better buy.

Continued on next page

Application 3: Comparison Shopping (continued)**Using Posted Unit Prices**

Even when unit prices are posted at the store, you may need to do some math. Remember, in order to compare unit prices, the unit of measurement must be the same. If they are not the same, you will have to change one of them.

Suppose you want to buy sliced ham at the deli section of the grocery store. At Sue's Grocery, sliced ham is sold for \$5.28 per pound. Joe's Foods sells sliced ham for 35¢ per ounce. You cannot compare unit prices because the units of measurement are different.

How can you figure out which ham costs less? You have a choice. You can either:

- Figure out how much one ounce of ham would cost at Sue's Grocery, then compare that price to the price per ounce at Joe's.
- Figure out how much one pound of ham would cost at Joe's Foods, then compare that price to the price per pound at Sue's.

Here's how you would compare prices using the second method. First, you need to know:

$$16 \text{ ounces} = 1 \text{ pound}$$

Then you can calculate the price for one pound (16 ounces) of ham at Joe's Foods:

$$\$0.35 \text{ per ounce} \times 16 \text{ ounces} = \$5.60 \text{ per pound}$$

Now you can see that the ham at Sue's Grocery is less expensive.

Practice Your Skills

Solve the following problems in the space provided. Show your work.

1. If a dozen eggs cost \$1.08, what is the cost per egg? _____
2. A 5-pound bag of whole wheat flour costs \$1.80. What is the price per pound? _____
3. Find the unit price of each item below. (Round off answers to the nearest tenth of a cent.) Circle the item in each pair that has the lowest unit price.
 - a. Spaghetti sauce: 16-ounce jar for \$2.59; 14-ounce jar for \$2.49
 - b. Frozen vegetables: 16-ounce bag for \$1.52; 10-ounce box for \$0.89
 - c. Bread: 16-ounce loaf for \$1.89; 20-ounce loaf for \$2.09

Continued on next page

Application 3: Comparison Shopping (continued)

- d. Salsa: 24-ounce jar for \$3.69; 30-ounce jar for \$4.09
 - e. Chicken legs: 8-ounce package for \$0.59; 12-ounce package for \$0.99
 - f. Potato salad: 9-ounce container for \$2.49; 20-ounce container for \$4.99
 - g. Cheddar cheese: 6-ounce package for \$2.99; 24 ounce package for \$5.99
4. A gallon of milk costs \$2.99. A quart costs \$1.26. (One gallon has four quarts.) Compare the unit price of the two sizes. Which is the better buy?
 5. A 1-pound bag of apples costs \$1.29. There are 8 apples in the bag. How much does 1 apple cost? How much do 7 apples cost?
 6. A box of Brand A cookies costs \$4.22 for 10 ounces. A box of Brand B cookies costs \$5.69 for 14 ounces. Which brand is the least expensive per ounce?
 7. Assume you are shopping for a picnic. There will be 24 friends attending the picnic. Since you are on a limited budget, you decide to compare brands of the chosen picnic foods. Review the following chart and then respond to items a through g. (Round off answers to the nearest tenth of a cent.)

Brand A		Brand B	
Foods and Amount	Total Cost	Food and Amount	Total Cost
4-1 lb. packages of hot dogs (8 per pound)	\$15.96	4-1 lb. packages of hot dogs (8 per pound)	\$15.16
24-count hot dog bakery buns	\$6.27	2-12-count packages hot dog buns	\$3.78
24 oz. bottle ketchup	\$1.89	32 oz. bottle ketchup	\$3.17
2-14 oz. bottles mustard	\$3.10	24 oz. bottle of mustard	\$3.99
2 lbs. mini carrots	\$2.99	2 lbs. whole carrots (to be cut)	\$1.49
4-6-count packages brownies	\$7.14	2-12-count packages brownies	\$6.58
1½ gal. fruit punch (16 servings per gallon)	\$4.78	2 gal. fruit punch (16 servings per gallon)	\$5.58

- a. What is the total food and beverage cost for both brands? Circle the best buy.

Brand A _____ Brand B _____

Continued on next page

Application 3: Comparison Shopping (continued)

- b.** What is the cost of 1-pound of hot dogs for each brand? Circle the best buy.

Brand A _____ Brand B _____

- c.** What is the unit cost of one hot dog with bun for each brand? Circle the best buy.

Brand A _____ Brand B _____

- d.** Plan 1-ounce each of ketchup and mustard for each hot dog. What is the cost for each? Circle the best buy regarding cost per serving for each. How might you handle the cost factor for the leftover brand B ketchup and brand A mustard?

Brand A ketchup _____ Brand B ketchup _____

Brand A mustard _____ Brand B mustard _____

- e.** What is the cost of 1 brownie for each brand? Circle the best buy.

Brand A _____ Brand B _____

- f.** What is the cost of 1 serving of punch for each brand? How might you handle the cost factor for the leftover punch for brand B?

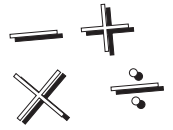
Brand A _____ Brand B _____

- g.** What is the total cost per meal for one person for each brand (include hot dog with bun, ketchup, and mustard; carrots; brownie; and fruit punch)? Circle the best buy.

Brand A _____ Brand B _____

- h.** In order to save the most money, list the brand of each food item you would choose in the space provided. Determine the total cost for your picnic meal after making your choices.

Total cost of meal: _____

Application 4**Buying Meat, Poultry, and Fish**

When you buy meat, poultry, or fish, it is important to know the number of servings per pound that the different cuts will yield. For example, some meat is lean and has no bones. You may be able to make four servings from a pound of this type of meat. A different cut of meat may have a large amount of fat and bone that you will discard. A pound of this meat may make only one or two servings.

How can you take this difference into account when you shop? Compare the price per serving of meat, poultry, or fish. Here's how.

Step 1: Find the cost per pound on the label.

Step 2: Locate the type of cut on the chart below. Find the number of servings per pound.

	Type of Cut	Servings per Pound
FISH	Whole or drawn	1
	Dressed	2
	Steaks or fillets	3
POULTRY	With bones	2
	Boneless or ground	4
MEAT	Lean, boneless or ground	3 to 4
	Moderate amount of bone and/or fat	2 to 3
	Large amount of bone and/or fat	1 to 2

Step 3: Use the formula: cost per pound \div servings per pound = cost per serving

Repeat these three steps for the different cuts of meat, poultry, or fish you are considering. Then compare the cost per serving of each. Use this information to help you decide what to buy.

Example: Suppose you are shopping for an economical cut of pork. At the store, you find:

- Boneless loin roast at \$3.60 per pound.
4 servings per pound $\rightarrow 3.6 \div 4 = 0.9 \rightarrow$ \$0.90 per serving
- Rib chops, with some fat and bone, at \$3.50 per pound.
3 servings per pound $\rightarrow 3.5 \div 3 = 1.166 \rightarrow$ \$1.17 per serving
- Spare ribs, with a lot of bone and fat, at \$2.00 per pound.
2 servings per pound $\rightarrow 2 \div 2 = 1 \rightarrow$ \$1.00 per serving

Although the boneless roast has the highest cost per pound, it has the lowest cost per serving.

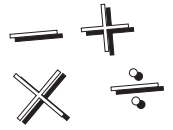
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Application 4: Buying Meat, Poultry, and Fish (continued)

Practice Your Skills

Find the cost per serving of each item that follows. Show your work in the space provided. If the chart on page 49 gives a range, such as 3 to 4 servings per pound, use the higher number. Round answers off to the nearest cent.

1. Ground round, \$2.69 per pound _____
2. Soup bone with meat, \$1.29 per pound _____
3. Round steak with bone, \$3.49 per pound _____
4. Cut-up chicken, \$1.39 per pound _____
5. Boneless chicken breasts, \$3.99 per pound _____
6. Pollack fillets, \$2.99 per pound _____
7. Swordfish steak, \$11.99 per pound _____
8. Flank steak (no bone), \$8.79 per pound _____
9. Lamb chops (with bone), \$6.59 per pound _____
10. Cornish hens (with bone), \$12.99 per pound _____
11. Ground beef (chuck), \$0.99 per pound _____
12. Whitefish fillets, \$3.99 per pound _____
13. Veal chops (with bone), \$7.39 per pound _____
14. Ground lamb, \$2.69 per pound _____
15. New York Strip steak (no bone), \$9.99 per pound _____
16. Ground turkey, \$2.49 per pound _____

Application 5**Converting Measurements to Equivalents**

When you work with customary measurements in recipes, you may need to convert from one unit of measurement to another. This is especially true if you are going to change the yield of a recipe. For example, you may need to know how many teaspoons are in $\frac{1}{4}$ cup.

If you have a chart of equivalents handy, you may be able look up the answer. However, you won't need to use a chart if you know these basic measurement facts:

Weight: 16 ounces (oz.) = 1 pound (lb.)

Volume: 3 teaspoons (tsp.) = 1 tablespoon (Tbsp.)
 2 Tbsp. = 1 fluid oz.
 8 fluid oz. = 1 cup

As long as you know these measurement facts, you can use simple math to convert from one unit of measurement to another.

Example: How many fluid ounces are in $\frac{1}{2}$ cup?
 1 cup is 8 fluid ounces, so $\frac{1}{2}$ cup is 4 fluid ounces ($8 \times \frac{1}{2}$, or $8 \div 2$)

Example: How many tablespoons are in $\frac{1}{3}$ cup?
 First, find how many tablespoons are in 1 cup:

8 ounces per cup \times 2 Tbsp. per ounce = 16 Tbsp. in 1 cup

Now take $\frac{1}{3}$ of 16:

$$\frac{1}{3} \times 16 = \frac{16}{3} = 5\frac{1}{3} \text{ Tbsp. (or 5 Tbsp. and 1 tsp.)}$$

The more you practice converting measurements, the easier it will become. Soon you will be able to do many conversions quickly.

Practice Your Skills

Solve the following problems in the space provided. Show your work.

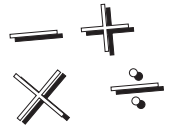
1. How many ounces are in $\frac{1}{4}$ pound? _____

2. How many fluid ounces are in $\frac{3}{4}$ cup? _____

Continued on next page

Application 5: Converting Measurements to Equivalents (continued)

3. How many tablespoons are in $\frac{1}{8}$ cup? _____
4. How many teaspoons are in $\frac{1}{4}$ cup? _____
5. How many tablespoons are in 1 cup? _____
6. How many ounces are in $\frac{1}{3}$ pound? _____
7. How many teaspoons are in 1 fluid ounce? _____
8. How many tablespoons are in $\frac{3}{4}$ cup? _____
9. How many fluid ounces are in 3 cups? _____
10. How much is 4 tablespoons expressed in fluid ounces? _____
11. How many pounds are in 8 ounces? _____
12. How many tablespoons are in $\frac{7}{8}$ cup? _____
13. How many ounces are in $\frac{3}{4}$ pound? _____
14. How much is 68 ounces expressed in pounds? _____
15. How many tablespoons are in $\frac{2}{3}$ cup? _____

Application 6**Changing the Yield of a Recipe**

The yield of a recipe tells how many servings it will make. Sometimes you may want to increase or decrease the yield to make a different number of servings.

To change the yield, each amount in the recipe must be multiplied by the same number—the “magic number.” Multiplying by a number greater than 1 increases the yield. Multiplying by a fraction less than 1 decreases the yield.

Here are the four basic steps to follow when changing the yield:

Step 1: Decide how many servings you want. This is called the *desired yield*.

Step 2: Find the “magic number.” Remember the formula:

$$\text{desired yield} \div \text{original yield} = \text{magic number}$$

Step 3: Multiply each amount by the “magic number” you found in Step 2.

Step 4: If necessary, convert the amounts to a different unit of measure.

Try An Example

Suppose you are using the recipe on page 318 of *Discovering Food and Nutrition*, “Easy Posole Stew.” You decide to make only two servings of stew instead of four. What number do you multiply by?

$$\text{desired yield} \div \text{original yield} = \text{magic number}$$

So: $2 \div 4 =$ number to multiply by

$$2 \div 4 = 0.5 \quad \text{OR} \quad 2 \div 4 = \frac{2}{4} = \frac{1}{2}$$

The first amount in the recipe is 2 tsp. oil:

$$2 \text{ tsp.} \times \frac{1}{2} = \frac{2}{1} \times \frac{1}{2} = 1 \text{ tsp.}$$

Application 6: Changing the Yield of a Recipe (continued)

The next amounts are $\frac{1}{4}$ cup chopped onion and $\frac{1}{4}$ cup chopped pepper.

$\frac{1}{4}$ cup

↓

$\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$ cup

Convert Cup to Tbsp.

1 cup = 16 Tbsp., so $\frac{1}{8}$ cup = $\frac{1}{8}$ of 16 Tbsp.

$\frac{1}{8} \times 16 = \frac{16}{8} = 2$ Tbsp.

↓

You would need 2 Tbsp. *each* of chopped onion and chopped pepper.

Continue to calculate the new amounts.

Garlic clove: The recipe calls for 1 whole garlic clove. To make half this recipe you could use $\frac{1}{2}$ garlic clove. You could also use a smaller clove, or if you really like garlic you could just use the whole clove!

Chicken broth: 2 cups $\times \frac{1}{2} = 1$ cup

Hominy: 2 cups $\times \frac{1}{2} = 1$ cup

Oregano: $\frac{1}{2}$ tsp. $\times \frac{1}{2} = \frac{1}{4}$ tsp.

Now you've finished your calculations! Remember to:

- Write all the new amounts down. Follow your list of new amounts when you prepare the recipe.
- Use the right size equipment. For the stew, you may need to use a smaller saucepan.

Application 6: Changing the Yield of a Recipe (continued)

Practice Your Skills

Solve the following problems in the space provided. Show your work.

1. Alter the recipe for “Cheesy Potato Bake” so that it would make 2 servings. Show your work in the space provided.

Yield: 4 servings	$\frac{1}{8}$ tsp.	pepper
2 large baking potatoes	1 Tbsp.	fresh parsley, chopped
1 Tbsp. butter or margarine, melted	$\frac{1}{3}$ cup	Swiss cheese, shredded
$\frac{1}{8}$ tsp. garlic salt	1 Tbsp.	Parmesan cheese, grated

2. Alter the recipe for “Favorite Green Beans” so that it would make 6 servings. Show your work in the space provided.

Yield: 4 servings	2 tsp.	cornstarch
$\frac{3}{4}$ lb. fresh green beans	$\frac{1}{2}$ tsp.	dry mustard
$\frac{1}{2}$ cup water	1 Tbsp.	vinegar
2 slices bacon	2 Tbsp.	onion, chopped
1 Tbsp. brown sugar		

Application 6: Changing the Yield of a Recipe (continued)

3. Alter the recipe for “Pork and Salsa Burritos” so that it would make 10 servings. Show your work in the space provided.

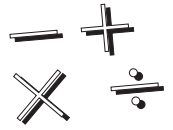
Yield: 4 servings

$\frac{1}{4}$ lb.	ground pork	$\frac{1}{2}$ cup	fat-free refried beans
$\frac{1}{4}$ tsp.	chili powder	$\frac{1}{2}$ cup	prepared chunk salsa
$\frac{1}{8}$ tsp.	cumin	4	large (7- to 8-in.) flour tortillas
$1\frac{1}{2}$ cups	fresh spinach, chopped	$\frac{1}{4}$ cup	low-fat shredded cheddar cheese

4. Alter the recipe for “Easy Posole Stew” so that it would make 6 servings. Show your work in the space provided.

Yield: 4 servings

2 tsp.	oil	2 cups	low-sodium chicken broth
$\frac{1}{4}$ cup	onion, chopped	2 cups	canned hominy, drained and rinsed
$\frac{1}{4}$ cup	red or green bell pepper, chopped	$\frac{1}{2}$ tsp.	oregano
1 clove	garlic, minced		

Application 7

Figuring the Cost of a Recipe

At times you may want to know how much it costs to prepare a recipe. You can use this information in several ways. For example, you can compare recipes to find out which ones are most economical. You could compare the costs of baking a cake from scratch with using a cake mix or buying a ready-made cake. You could even see how the cost of making pizza at home compares with having one delivered.

Here are the steps in figuring the cost of a recipe:

Step 1: Gather price information.

Shop for the ingredients used in the recipe. Make a note of the size of each item (for example, a 5-pound bag of flour) and the price.

Note: You do not need to figure in the cost of small amounts of seasonings.

Step 2: For each ingredient, find the cost of the amount used in the recipe.

If you bought the exact amount you need for the recipe, this step is easy. But if you bought a larger amount than you will use, you need to do some calculating.

Problem-solving skills can help you figure out the easiest way to find the answer. Here are some examples.

<i>Situation</i>	<i>Solution</i>
<ul style="list-style-type: none"> • The recipe calls for 8 ounces of noodles. You bought a 16-ounce package of noodles. 	<ul style="list-style-type: none"> • You will use 8 out of 16 ounces, or half the package. Divide the cost of the whole package by 2 to find the cost for 8 ounces.
<ul style="list-style-type: none"> • The recipe calls for $1\frac{1}{2}$ pounds of ground beef. You bought an economy-size package weighing 3.48 pounds. 	<ul style="list-style-type: none"> • Look on the meat label for the price per pound. Multiply by 1.5 to find the cost for $1\frac{1}{2}$ pounds.
<ul style="list-style-type: none"> • The recipe calls for $2\frac{1}{4}$ cups of sifted flour. You bought a 5-pound bag. 	<ul style="list-style-type: none"> • Use the chart on the next page. It shows that a 5-pound bag of flour will give you 20 cups when sifted. Divide the price of the bag by 20 to find the price per cup of flour. Multiply by 2.25 to find the cost for $2\frac{1}{4}$ cups of flour.

Step 3: Add the cost of all the ingredients. This will give you the total cost of the recipe.

Step 4: Find the cost per serving.

Divide the total cost of the recipe by the number of servings it will make. Round off the answer to the nearest cent.

Continued on next page

Application 7: Figuring the cost of a recipe (continued)

Directions: Use the charts on this page to complete the activities on pages 59 and 60.

Volume Equivalents		
U.S. Standard Unit	U.S. Standard Equivalent	Approximate Metric Equivalent
Dash	Less than $\frac{1}{8}$ tsp.	Less than 0.5 mL
$\frac{1}{4}$ tsp.		1 mL
$\frac{1}{2}$ tsp.		2 or 3 mL
1 tsp.		5 mL
1 Tbsp.	3 tsp.	15 mL
1 fluid oz.	2 Tbsp.	30 mL
1 cup	16 Tbsp. or 8 fluid oz.	250 mL
1 pt.	2 cups or 16 fluid oz.	500 mL
1 qt.	2 pt. or 4 cups or 32 fluid oz.	1 L or 1000 mL
1 gal.	4 qt.	4 L

Converting Weight To Volume		
<p>When you buy ingredients, packages are usually labeled by weight. However, recipes usually use volume measurements, such as cups or teaspoons. Use this chart to find out how many cups or teaspoons are in a package.</p>		
Ingredient	Weight	Volume
Baking powder (double-acting)	7 oz.	60 tsp.
Baking soda	1 lb.	112 tsp.
Butter or margarine	1 lb.	2 cups (32 Tbsp.)
Cheese, grated Parmesan	3 oz.	1 cup
Cheese, shredded	1 lb.	4 cups
Cocoa powder	8 oz.	2 cups
Flour, all-purpose	5 lb.	20 cups when sifted 17 $\frac{1}{2}$ cups unsifted
Flour, whole-wheat	2 lb.	6 $\frac{2}{3}$ cups
	5 lb.	16 $\frac{2}{3}$ cups
Macaroni	1 lb.	3 $\frac{3}{4}$ cups
Noodles	1 lb.	6 to 8 cups
Rice	1 lb.	2 $\frac{1}{2}$ cups
Shortening	1 lb.	2 $\frac{1}{3}$ cups
Sugar, brown	1 lb.	2 $\frac{1}{4}$ cups
Sugar, granulated	5 lb.	11 $\frac{1}{4}$ cups
Vegetables, frozen	10 oz.	2 cups

Continued on next page

Application 7: Figuring the cost of a recipe (continued)

Weight Equivalents		
U.S. Standard Measure	U.S. Standard Equivalent	Approximate Metric Equivalent
1 oz.		30 g
1 lb.	16 oz.	500 g
2 lb.	32 oz.	1 kg or 1000 g

Practice Your Skills

Solve the following problems in the space provided. Show your work.

1. If the total cost of the ingredients for a recipe is \$11.50 and the yield is 6 servings, what is the cost per serving?

2. A recipe for soup makes 4 servings. The costs of the main ingredients are: beef, \$2.59; canned broth, \$1.09; frozen vegetables, \$1.59; canned tomatoes, \$1.29; noodles, \$0.59. What is the cost per serving?

Application 7: Figuring the cost of a recipe (continued)

3. Suppose a 1-pound box of brown sugar costs \$0.99. What would be the cost for $\frac{1}{4}$ cup of brown sugar? (Hint: Use the charts on page 58.)

Bonus Activities

1. Choose a recipe from your textbook or a cookbook with 8 or less ingredients. List the ingredients in the space provided. Visit a supermarket to gather price information for preparing the recipe. Calculate the cost per serving. Circle your answer.

2. Choose a convenience food, such as a frozen main dish. Find a recipe for a similar food. Find the cost for the ingredients. Calculate the cost per serving of each. Which is more economical? Circle your answer.