

STUDY LINK
11•8**Unit 12: Family Letter****Rates**

For the next two or three weeks, your child will be studying rates. Rates are among the most common applications of mathematics in daily life.

A rate is a comparison involving two different units. Familiar examples come from working (dollars per hour), driving (miles per hour), eating (calories per serving), reading (pages per day), and so on.

Our exploration of rates will begin with students collecting data on the rate at which their classmates blink their eyes. The class will try to answer the question "Does a person's eye-blinking rate depend on what the person is doing?"

During this unit, students will collect many examples of rates and might display them in a Rates All Around Museum. Then they will use these examples to make up rate problems, such as the following:

1. If cereal costs \$2.98 per box, how much will 4 boxes cost?
2. If a car's gas mileage is about 20 miles per gallon, how far can the car travel on a full tank of gas (16 gallons)?
3. If I make \$6.25 per hour, how long must I work to earn enough to buy shoes that cost \$35?

Then the class will work together to develop strategies for solving rate problems.

The unit emphasizes the importance of mathematics to educated consumers. Your child will learn about unit-pricing labels on supermarket shelves and how to use these labels to decide which of two items is the better buy. Your child will see that comparing prices is only *part* of being an educated consumer. Other factors to consider include quality, the need for the product, and, perhaps, the product's effect on the environment.

This unit provides a great opportunity for your child to help with the family shopping. Have your child help you decide whether the largest size is really the best buy. Is an item that is on sale necessarily a better buy than a similar product that is not on sale?

Finally, students will look back on their experiences in the yearlong World Tour project and share them with one another.

Please keep this Family Letter for reference as your child works through Unit 12.

Nutrition Facts	
Serving Size 1 link (45 g)	
Servings per Container 10	
Amount per Serving	
Calories 150	Calories from Fat 120
<small>% Daily Value</small>	
Total Fat 13 g	20%
Total Carbohydrate 1 g	<1%
Protein 7 g	

Vocabulary

Important terms in Unit 12:

comparison shopping Comparing prices and collecting other information needed to make good decisions about which of several competing products or services to buy.

consumer A person who acquires products or uses services.

per For each, as in ten chairs per row or six tickets per family.

rate A comparison by division of two quantities with different units. For example, a speed such as 55 miles per hour is a rate that compares distance with time.

rate table A way of displaying *rate* information as in the miles per gallon table below.

Miles	35	70	105	140	175	210
Gallons	1	2	3	4	5	6

unit price The price *per* item or unit of measure. For example, if a 5-ounce package of something costs \$2.50, then \$0.50 per ounce is the unit price.

unit rate A *rate* with 1 in the denominator. For example, 600 calories per 3 servings or $\frac{600 \text{ calories}}{3 \text{ servings}}$ is not a unit rate, but 200 calories per serving ($\frac{200 \text{ calories}}{1 \text{ serving}}$) is a unit rate.



Do-Anytime Activities

To work with your child on concepts taught in this unit, try these interesting and rewarding activities:

1. Have your child examine the Nutrition Facts labels on various cans and packages of food. The labels list the number of servings in the container and the number of calories per serving. Have your child use this information to calculate the total number of calories in the full container or package. *For example:*
A can of soup has 2.5 servings.
There are 80 calories per serving.
So the full can has $2.5 * 80 = 200$ calories.
2. Have your child point out rates in everyday situations. *For example:*
store price rates: cost per dozen, cost per 6-pack, cost per ounce
rent payments: dollars per month or dollars per year
fuel efficiency: miles per gallon
wages: dollars per hour
sleep: hours per night
telephone rates: cents per minute
copy machine rates: copies per minute
3. Use supermarket visits to compare prices for different brands of an item and for different sizes of the same item. Have your child calculate unit prices and discuss best buys.

Building Skills through Games

In this unit, your child will play the following games. For more detailed instructions, see the *Student Reference Book*.

Credits/Debits Game (Advanced Version) See *Student Reference Book*, page 239.

This game for 2 players simulates bookkeeping for a small business. A deck of number cards represents "credits" and "debits." Transactions are entered by the players on recording sheets. The game offers practice in addition and subtraction of positive and negative integers.

Fraction Top-It See *Student Reference Book*, page 247.

This game is for 2 to 4 players and requires one set of 32 Fraction Cards. The game develops skills in comparing fractions.

Name That Number See *Student Reference Book*, page 254.

This game is for 2 or 3 players and requires 1 complete deck of number cards. The game develops skills in representing numbers in different ways.

As You Help Your Child with Homework

As your child brings assignments home, you may want to go over the instructions together, clarifying them as necessary. The answers listed below will guide you through this unit's Study Links.

Study Link 12•1

2. $\frac{3}{5}$ 3. $\frac{1}{8}$
4. 1 5. $\frac{5}{6}$

Study Link 12•2

1. \$315
2. \$12
3. 14 hours
4. a. 364 minutes per week
 b. 156 minutes
5. 9,096 6. 54,810
7. 81 R4 8. 13

Study Link 12•3

1. 2,100 feet
2. a. 3,500 pounds
 b. 420 gallons
3. 25 feet per second
4. a. 375 gallons
 b. 1,500 quarts
5. a. 480 feet
 b. 754 minutes, or $12\frac{1}{2}$ hours
6. 1,593 7. 55,080
8. 180 R4 9. 67

Study Link 12•4

1. 8 cents
2. \$0.69
3. \$0.35
4. Answers vary.
5. 1, 12; 2, 6; 3, 4
6. 1, 50; 2, 25; 5, 10

Study Link 12•5

1. \$0.63
2. \$0.37
3. \$0.15
4. \$0.35
5. \$1.02
6. Sample answer: The 8-ounce cup is the better buy. The 8-ounce cup costs 9 cents per ounce, and the 6-ounce cup costs 10 cents per ounce.
7. Answers vary.
8. 1, 2, 3, 6, 7, 14, 21, 42
9. 1, 23

Study Link 12•6

1. 1,245 miles
2. About 9 times
3. a. About 69%
 b. About 49%
4. $\frac{8}{54}$, or $\frac{4}{27}$
5. a. China
 b. 6
 c. 9
 d. $9\frac{1}{2}$