

What We Are Learning

Ratios and Proportions

Vocabulary

These are the math words we are learning:

equivalent ratios ratios that name the same comparison

corresponding angles congruent angles in similar figures

corresponding sides sides of similar figures whose lengths are proportional to each other

indirect measurement the use of similar figures and proportions to find the measure of an object that cannot be directly measured

proportion an equation that states two ratios are equivalent

rate a comparison of two quantities that have different units of measure

ratio the comparison of two quantities by division

scale the ratio between two sets of measurements

scale drawing a drawing of a real object that is proportionally smaller or larger than the real object

Dear Family,

Your child will be learning how to write and solve problems involving ratios, rates, and proportions. A **ratio** compares two items or quantities using division and can be written in one of three ways: comparing a part to a part, a part to a whole, or a whole to a part.

Use the table to write each ratio.

Boys	Girls
11	12

boys to girls

$\frac{11}{12}$ or 11 to 12 or 11:12 part to part

boys to total number of students

$\frac{11}{23}$ or 11 to 23 or 11:23 part to whole

total number of students to girls

$\frac{23}{12}$ or 23 to 12 or 23:12 whole to part

A **rate** compares two quantities that have different measures. By learning to find the **unit rate** between two items, your child will be able to determine which rate is the better deal.

Grocery Store A is selling 5 pounds of potatoes for \$3.50. Grocery Store B is selling 3 pounds of potatoes for \$1.89. Which is the better deal?

Grocery Store A		Grocery Store B	
$\frac{\$3.50}{5 \text{ lb}}$	Write the rate.	$\frac{\$1.89}{3 \text{ lb}}$	Write the rate.
$\frac{\$3.50 \div 5}{5 \text{ lb} \div 5}$	Divide both terms by 5.	$\frac{\$1.89 \div 3}{3 \text{ lb} \div 3}$	Divide both terms by 3.
$\frac{\$0.70}{1 \text{ lb}}$	\$0.70 per pound	$\frac{\$0.63}{1 \text{ lb}}$	\$0.63 per pound

Grocery Store B has the better deal on the potatoes. The unit rate of \$0.63 per pound is cheaper than that of \$0.70 per pound.

similar figures that have exactly the same shape but not necessarily the same size

unit rate a rate in which the second quantity in the comparison is one unit

Your child will apply the concepts of ratios to solve proportions. A **proportion** is an equation that states two ratios are equivalent. Proportions are very helpful in everyday life situations. Your child will use proportions to make conversions between units, identify similar figures, find indirect measurements, and determine distances with maps and scales.

This is how your child will use cross products to find a missing value in a proportion.

Find the missing value in the proportion.

$$\frac{3}{8} = \frac{9}{x}$$

$$\frac{3}{8} = \frac{9}{x}$$

Find the cross products

$$3 \cdot x = 8 \cdot 9 \quad \text{The cross products are equal.}$$

$$3x = 72$$

$$\frac{3x}{3} = \frac{72}{3}$$

Divide both sides by 3 to undo the multiplication.

$$x = 24$$

Your child can also use proportions to make conversions within the customary measurement system. An example of this is shown below.

Dave has 63 feet of material. How many yards can be cut from the material?

One yard equals 3 feet, so use the unit conversion factor

$$\frac{1 \text{ yard}}{3 \text{ feet}} \text{ or } \frac{3 \text{ feet}}{1 \text{ yard}}$$

$$63 \text{ ft} \cdot \frac{1 \text{ yd}}{3 \text{ ft}} = \frac{63}{3} = 21 \text{ yd} \quad \text{Multiply and cross out "ft".}$$

Dave can cut 21 yards from the material.

By knowing how to find missing values using proportions, your child will be able to solve a myriad of real life math problems. Have your child tell you how to find a missing value when solving problems that use proportions.

Sincerely,

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Family Letter
Ratios and Proportions

Use the table to write each ratio.

	Mr. Worth's Class	Mrs. Adam's Class
6th graders	28	24
7th graders	18	26

1. 6th graders to 7th graders

2. Mrs. Adam's 7th graders to Mr. Worth's 6th graders

3. Company X sells a 64-oz carton of orange juice that costs \$2.24. Company Y sells a 48-oz carton of orange juice for \$1.92. Which is the better deal?

Find the missing value in each proportion.

4. $\frac{3}{4} = \frac{x}{16}$

5. $\frac{5}{14} = \frac{25}{m}$

6. $\frac{6}{x} = \frac{18}{30}$

7. St. Paul's Cathedral has a tower that is 366 ft tall. How many yards is this?

8. The tallest hand-built sand sculpture took 96 hours to build. How many days is this?

9. A picture is 10 inches long by 8 inches wide. A similar picture is 2.5 inches long. How wide is it?

10. A tree casts a shadow 30 ft long. At the same time, a 5-ft woman casts a 3 ft shadow. How tall is the tree?

11. On a city map, the school is 1.75 cm from the park. If the scale is 1 cm = 6 km, what is the actual distance from the school to the park?

Answers: 1. $\frac{11}{13}$ 2. $\frac{14}{3}$ 3. 64-oz carton 4. $x = 12$ 5. $m = 70$ 6. $x = 10$ 7. 122 yards 8. 4 days 9. 2 in. 10. 50 ft tall 11. 10.5 km

A smart shopper can find the best value on a certain product by comparing unit prices. Practice being a smart shopper by circling the better deal for each item listed below.

Item	Bob's Bargains	Dottie's Deals
Pet Food	15 pounds for \$16.50	10 pounds for \$12.99
Shampoo	24 ounces for \$0.99	16 ounces for \$0.75
Laundry Detergent	64 ounces for \$3.99	128 ounces for \$6.99
Printer Ink	4 cartons for \$90.00	2 cartons for \$42.00
Apples	5 pound bag for \$3.99	3 pound bag for \$1.75
Milk	1 gallon for \$2.59	3 gallons for \$8.00
Pencils	24 for \$2.09	12 for \$0.99
Eggs	1 dozen for \$1.09	18 eggs for \$2.00

Answers: Bob, Bob, Dottie, Dottie, Dottie, Dottie, Dottie, Bob, Dottie, Bob

What We Are Learning

Percents

Vocabulary

These are the math words we are learning:

discount the amount that is subtracted from the original price of an item

percent a ratio comparing a number to 100

sales tax a percent of the cost of an item, which is charged by states to raise money

tip the amount of money added to a bill

Dear Family,

Your child will be learning about the relationship between percents, decimals, and fractions. In order to be able to recognize this relationship, your child will learn how to write a percent as a decimal and as a fraction.

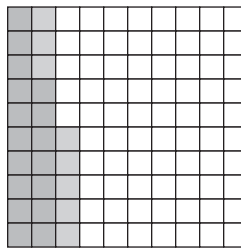
Your child will also be converting from decimals and fractions to percents. Your child will learn that a **percent** is a ratio comparing a number to 100 and is written using the % symbol.

Percents can be written as fractions or decimals. Likewise, both fractions and decimals can be written as percents.

$$25\% = \frac{25}{100} = 0.25$$

Percent Fraction Decimal

Your child can model percents in much the same way as fractions and decimals are modeled, by shading in the proper portion of a 10 by 10 grid. For example:



25%

Write 60% as a fraction in simplest form.

$$60\% = \frac{60}{100}$$

Write the percent as a fraction with a denominator of 100.

$$\frac{60}{100} = \frac{3}{5}$$

Write the fraction in simplest form.

Write $\frac{7}{8}$ as a percent.

$$\frac{7}{8} = 7 \div 8 = 0.875$$

Use division to write the fraction as a decimal.

$$0.875 = 87.5\%$$

Write the decimal as a percent.

Write 0.89 as a percent.

$$0.89 = \frac{89}{100}$$

Use what you know about place value to express the decimal as a fraction (eighty-nine hundredths).

$$\frac{89}{100} = 89\%$$

Write the numerator with a percent symbol.

Once your child has mastered converting between percents, decimals, and fractions, he or she will begin to solve problems using percents. Your child will learn to set up proportions and then find the missing value. Here is an example of how your child will use proportions to solve percent problems.

There are 650 students at Highland Elementary School. Thirty-five percent of all students attending the school ride the bus. Find the number of students that ride the bus.

$$\frac{\%}{100} = \frac{\text{is}}{\text{of}}$$

Set up the proportion.

$$\frac{35}{100} = \frac{s}{650}$$

Let s equal the number of students who ride the bus. Set up a proportion. You need to find the “is” part of the proportion.

$$100s = 22,750$$

The cross products are equal.

$$\frac{100s}{100} = \frac{22,750}{100}$$

Divide both sides by 100 to undo the multiplication.

$$s = 227.5$$

Round your answer to the nearest whole number so your answer will be reasonable.

There are about 228 students who ride the bus each day to school.

Percents are a valuable part of any math program. It allows students to apply what they learn to real life situations.

Encourage your child to calculate the tax on a purchase or the tip for services rendered. Seeing math used in everyday life will have a profound effect on your child’s math performance.

Sincerely,

Family Letter

Percents

Write each percent as a fraction in simplest form.

1. 60%

2. 12%

3. 51%

4. 7%

Write each percent as a decimal.

5. 8%

6. 43%

7. 99%

8. 12%

Write each decimal as a percent.

9. 0.462

10. 0.2

11. 0.83

12. 0.05

Write each fraction as a percent.

13. $\frac{5}{8}$

14. $\frac{2}{5}$

15. $\frac{39}{50}$

16. $\frac{9}{20}$

Solve.

17. Joe owns 30 music CDs. If rap music makes up 40% of his collection, how many rap CDs does Joe own?

18. Mrs. Gonzalez ordered a dining room table. She had to pay 20% of the total cost when she ordered the table. She will pay the remaining balance when the table is delivered. If she has already paid \$60, how much more does she owe?

19. Find 66% of 250.

20. Jean went out to dinner. Her bill was \$16.71. If she left a tip that was 15% of the bill, about how much was the amount of the tip?

Answers: 1. $\frac{3}{5}$ 2. $\frac{25}{100}$ 3. $\frac{51}{100}$ 4. $\frac{100}{7}$ 5. 0.08 6. 0.43 7. 0.99 8. 0.12 9. 46.2% 10. 20% 11. 83% 12. 5% 13. 62.5% 14. 40% 15. 78% 16. 45% 17. 12 CDs 18. \$240 19. 165 20. \$2.50

CHAPTER

Family Fun

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Let's Go Shopping!

You have just won \$500 in a math contest! Your parents want you to put at least 30% of the prize money in your college savings account. You can spend rest of the money however you wish.

Listed below are some items on sale at the local mall. Use the chart to help you calculate the sale price for each item. Next choose which items you will purchase. Don't forget the 5% sales tax on your entire purchase. Once you are finished shopping, don't forget to stop by the bank to make the deposit into your saving account!

Item	Original Price	Sale	Sale Price
Computer Game	\$55.00	30% off	
Basketball	\$15.00	15% off	
Jeans	\$32.00	25% off	
Sweater	\$35.00	35% off	
Book	\$12.50	50% off	
Earrings	\$22.00	10% off	
Television	\$268.00	15% off	
Stereo	\$99.00	20% off	
Printer	\$215.00	25% off	

Items you purchased. _____

Total cost of your purchases (including tax). _____

Amount of money you saved on your purchases. _____

Amount of money you put into your college savings account. _____

Answers: Computer Game \$38.50, Basketball \$12.75, Jeans \$24, Sweater \$22.75, Book \$6.25, Earrings \$19.80, Television \$227.80, Stereo \$79.20, Printer \$161.25. The amount in the savings account is at least \$150.