

5.3 RATES

1

ESSENTIAL QUESTION

What is a unit rate and how do you find one?

2

COMMON CORE STATE STANDARDS

6.RP.2 Understand the concept of unit rate a/b associated with a ratio $a:b$ with b does not equal 0, and use rate language in the context of a ratio relationship.

6.RP.3a Make tables of equivalent ratios relating quantities with whole-number measurements find missing values in the tables. . . . Use tables to compare ratios.

6.RP.3b Solve unit rate problems including those involving unit pricing and constant speed.

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A **RATE** is a type of ratio that compares two quantities that have different units of measurement.
Some examples of rates are:

100 beats in 60 seconds

work 240 hours in 12 weeks

\$22.50 for 4 movie tickets

\$5.61 for 3 pounds

130 miles on 5 gallons

4

A **UNIT RATE** is a ratio that compares units of one quantity to **ONE UNIT** of another quantity.

Let's say we have the following **RATE**: 200 students in 4 classrooms

To find the unit rate we want find out how many students would be in a single classroom.

$$\begin{array}{r} 50 \\ 4 \overline{)200} \\ \underline{20} \\ 0 \\ \underline{0} \\ 0 \end{array}$$

15 students
per room

5

EXAMPLE Finding a Unit Rate

Jackson made 252 phone calls in 12 days. What is the average number of phone calls he made in a day

$$\begin{array}{r} 21 \\ 12 \overline{)252} \\ \underline{-24} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

21 calls
per day.

6

● On Your Own

A Japanese bullet train travels 558 miles in 3 hours. How far does it travel every hour?

$$\begin{array}{r} 186 \\ 3 \overline{)558} \\ \underline{-34} \\ 25 \\ \underline{-24} \\ 18 \\ \underline{-18} \\ 0 \end{array}$$

186 miles per hour

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● On Your Own

You pay \$8 for 16 ounces of sliced turkey. Write a unit rate that gives the price for each ounce of turkey.

$$\begin{array}{r} .5 \\ 16 \overline{)8.0} \\ \underline{-80} \\ 0 \end{array}$$

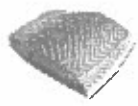
.50¢ per ounce

8

EXAMPLE Finding Equivalent Rates

A chef buys 6 pounds of salmon fillets for \$51. How much will the chef pay for 9 more pounds of salmon fillets?

① Find unit rate



$$\begin{array}{r} 8.5 \\ 6 \overline{)51.0} \\ \underline{-48} \\ 30 \\ \underline{-30} \\ 0 \end{array}$$

8.50 per pound

9 Multiply unit rate times 9

$$\begin{array}{r} 8.50 \\ \times 9 \\ \hline 16.50 \end{array}$$

It costs \$16.50 for 9 more pounds


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Multiply unit rate times 60
You can download 45 megabytes in a minute.

EXAMPLE Finding Equivalent Rates

You buy 2 pounds of tilapia fillets for \$16. What is the cost for 7 pounds of tilapia fillets?

Find the unit rate



$$\begin{array}{r} 8 \\ 2 \overline{)16} \\ \underline{-16} \\ 0 \end{array}$$

8 dollars per pound

Multiply unit rate times 7

10 7 pounds cost 56 dollars.

● On Your Own

Your download speed is 3 megabytes every 4 seconds. How many megabytes can you download in 1 minute?

Find unit rate

$$\begin{array}{r} .75 \\ 4 \overline{)3.00} \\ \underline{-28} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$


.75 megabyte per second

11

Multiply unit rate times 60
You can download 45 megabytes in a minute.

EXAMPLE Finding a Unit Rate

A piece of space junk travels 5 miles in 8 seconds. How far does it travel per second?



$$\begin{array}{r} .625 \\ 8 \overline{)5.000} \\ \underline{-48} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

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It travels .625 miles per second.