

TOPIC 5

Understand and Use Ratio and Rate

In this topic, students use ratios and rates, including unit rates, to solve problems.

CONNECT THE MATH

Ads for new, used, and rental cars often include the gas mileage, such as *35 miles per gallon*. This information is a unit rate: $\frac{35 \text{ mi}}{1 \text{ gal}}$. You could expect to drive a car with a full 11-gallon gas tank from Pensacola to Ocala before running out of gas, a rate of $\frac{385 \text{ mi}}{11 \text{ gal}}$.

There are many other rates associated with car use and ownership. These include the monthly car or lease payment, the insurance on the car, and the gas you buy and use.

Find opportunities to discuss rates with your student. Ask what the equivalent *unit rate* represents in those situations.





LESSON 5-1

Understand Ratios

Ratios can be used to describe the relationship between two quantities where for every x units of one quantity, there are y units of another quantity.

LESSON OBJECTIVES

- Use ratios to describe the relationship between two quantities.
- Use bar diagrams and double number line diagrams to model ratio relationships.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What's a Ratio?](#)
- [How Do You Solve a Word Problem Using Ratios?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [ratio](#)
- [term](#)

You can use these search terms and phrases to help your student find additional help online:

- writing a ratio to compare quantities
- using a ratio to model a problem

LESSON 5-2

Generate Equivalent Ratios

Equivalent ratios can be found by multiplying or dividing both terms by the same nonzero number.

LESSON OBJECTIVES

- Use multiplication and division to find equivalent ratios.
- Solve problems by finding equivalent ratios.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:


- [What Are Equivalent Ratios?](#)
- [How Do You Find Equivalent Ratios?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [circumference](#)
- [diameter](#)
- [equivalent ratios](#)
- [pi \(\$\pi\$ \)](#)

You can use these search terms and phrases to help your student find additional help online:

- multiplying to find equivalent ratios
 - dividing to find equivalent ratios
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LESSON 5-3

Compare Ratios

Ratio tables can be used to compare ratios and solve problems.

LESSON OBJECTIVES

- Use ratio tables to compare ratios.
- Compare ratios to solve problems.


HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Find Equivalent Ratios by Making a Table?](#)
- [How Do You Use a Table of Equivalent Ratios to Predict a Value?](#)

You can use these search terms and phrases to help your student find additional help online:

- comparing ratios
 - making a table of ratios
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LESSON 5-4

Represent and Graph Ratios

Equivalent ratios can be represented in a table, and the pairs of values can be plotted on the coordinate plane.

LESSON OBJECTIVES

- Represent equivalent ratios on graphs.
 - Use ratio tables and graphs to solve problems.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Find Equivalent Ratios by Making a Table?](#)

You can use these search terms and phrases to help your student find additional help online:

- making a table of ratios
 - graphing ratios
 - using repeated addition with ratios
 - ratios of pi (π)
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LESSON 5-5

Understand Rates and Unit Rates

A rate is a special type of ratio that compares two quantities

with different units of measure. A unit rate is a special rate that compares a quantity to one unit of another quantity.

LESSON OBJECTIVES

- Use rates to describe ratios in which the terms have different units.
 - Use rates and unit rates to solve problems.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What Are Rates and Unit Rates?](#)
- [How Do You Convert a Rate to a Unit Rate?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [rate](#)
- [unit rate](#)

You can use these search terms and phrases to help your student find additional help online:

- finding equivalent rates
 - finding unit rates
 - using unit rates to compare quantities
 - solving problems with unit rates
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LESSON 5-6

Compare Unit Rates

Rates are easily compared when they are expressed as unit rates.

LESSON OBJECTIVES

- Use ratio reasoning to compare rates and solve problems.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Use Unit Rates to Compare Rates?](#)
- [How Do You Solve a Word Problem Using Unit Rates?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [unit price](#)

You can use these search terms and phrases to help your student find additional help online:

- comparing unit rates
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LESSON 5-7

Solve Unit Rate Problems

Unit rates, including unit prices, can be used to solve problems.

LESSON OBJECTIVES

- Use unit rates to solve problems involving constant speed.
 - Use unit rates to solve problems involving unit price.
 - Solve unit rate problems using an equation.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Solve a Word Problem Using Unit Rates?](#)
- [How Do You Find Equivalent Ratios by Making a Table?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [constant speed](#)

You can use these search terms and phrases to help your student find additional help online:

- solving constant speed problems
 - solving unit price problems
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LESSON 5-8

Ratio Reasoning: Convert Customary Units

Unit rates and conversion factors can be used to convert customary units of measure.

LESSON OBJECTIVES

- Use ratio reasoning and conversion factors to convert customary units of measure.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [How Do You Convert Quarts to Gallons?](#)

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- [conversion factor](#)
- [dimensional analysis](#)

You can use these search terms and phrases to help your student find additional help online:

- converting customary units of length
- converting customary units of capacity
- converting customary units of weight

LESSON 5-9

Ratio Reasoning: Convert Metric Units

Unit rates and conversion factors can be used to convert metric units of measure.

LESSON OBJECTIVES

- Use ratio reasoning and conversion factors to convert metric units of measure.
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HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What Are the Metric Units of Length?](#)
- [What Are the Metric Units of Capacity?](#)

You can use these search terms and phrases to help your student find additional help online:

- converting metric units of length
- converting metric units of capacity
- converting metric units of mass



LESSON 5-10

Relate Customary and Metric Units

Unit rates and conversion factors can be used to convert between customary and metric units of measure.

LESSON OBJECTIVES

- Use ratio reasoning and conversion factors to convert between customary and metric units of measure.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- [What Are the Metric Units of Capacity?](#)

You can use these search terms and phrases to help your student find additional help

online:

- converting metric units and customary units
- customary and metric conversion factors