InsightMath California

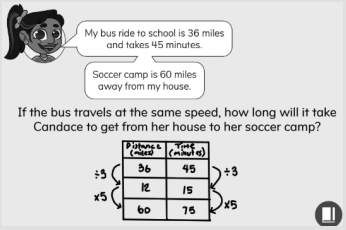
Discovering Ratios

Family Guide | Grade 6 | Unit 3

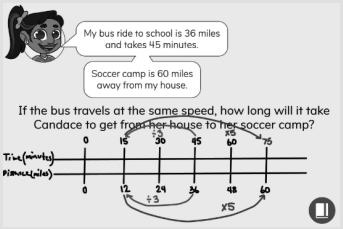
Your student is exploring how numbers and measures can be compared by their relative values.

Key Math Ideas

In this unit, students are introduced to ratios as a way of describing a proportional relationship between two quantities. Students find equivalent ratios using visual models, tables, graphs, and double number lines. They then learn how to scale up ratios by multiplying both sides of the ratio by the same amount and scale down by dividing both sides of the ratio by the same amount. The examples to the right show how students use an common factor to scale the ratio 36:45 down to the equivalent ratio 12:15 (by dividing by 3) and then scaling up to the equivalent ratio 60:75 (by multiplying by 5).



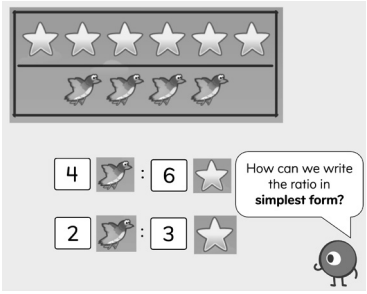
ratio table



double number line

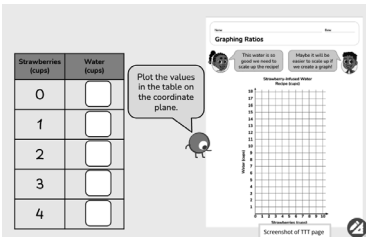
→ In the beginning of the unit, your student will learn to

- compare sets of objects using ratio thinking and represent it with ratio language
- (such as "2 dogs for every 1 cat") and symbol (such as 2 dogs : 1 cat);
- explain the difference between ratios that describe the relationship between parts (such as 2 dogs : 1 cat) and ratios that describe the relationship between a part and the whole (such as 2 dogs: 3 pets);
- write ratios in simplest form by creating equal groups.



→ In the middle of the unit, your student will learn to

- read and create bar models, tables, graphs, and double number lines to describe proportional relationships and find equivalent ratios;
- use ratio thinking to solve real-world problems involving converting
- measurements and scaling recipes up or down;
- choose a model or strategy to represent and interpret ratio relationships involving different measurement units, such money spent on gas and distance driven;
- find equivalent ratios through scaling up or scaling down by multiplying or dividing both sides of the ratio by the same amount, keeping the relationship proportional.



→ At the end of the unit, your student will learn to

- use proportional thinking and ratios to make comparisons between ratios;
- solve real-world problems involving comparisons by determining when to use
- ratios and when to use addition or multiplication thinking.

Helpful Hint

While exploring ratios for the first time, sometimes students thinks ratio and fractions are the same. However, while fractions always represent a part to whole relationship, ratios can represent either part-to-whole or part-to-part relationships. To support this distinction, have your student write two ratios to describe a situation, one comparing a part to the whole and another comparing the two parts.

Tips for Supporting Your Student at Home

Questions to Ask Your Student

→ In the beginning of the unit:

- What comparison is this ratio describing?
- How can you write the ratio in simplest form?

→ In the middle of the unit:

- How can you find an equivalent ratio?
- Do you need to scale this ratio up or down to find equivalent ratios? Why or why not?
- How can you find equivalent ratios when there is no common factor or multiple?

→ By the end of the unit:

- How can ratios help you compare the quantities?
- Can you use ratios to solve this problem? Why or why not?

If...	Try...
your student does not know how to start to find an equivalent ratio . . .	asking them what common factors or common multiples they know for each side of the ratio. After discussing this, students can use ratio tables, double numbers lines or other strategies to find equivalent ratios.

Student Strengths Spotlight

I take time to understand the problem and look for entry points.	Before starting to answer problems, students take time to understand and make sense of the problem. This helps them determine how to work with ratios.
I make a plan to solve a problem and adapt my plan if I need to.	Students choose their strategy for finding equivalent ratios, changing their plan depending on whether the problem requires proportional thinking or not.
I clarify my reasoning so others can make sense of it.	Students explain their reasoning to open-ended problems with multiple solutions.
I use math to represent real-life situations, and I create contexts to match the given math.	In this unit, students represent real-world situations with ratios. They also find equivalent ratios to solve real-world problems.

Try This Together!

- **Have a Ratio Snack!** While snacking, engage your student in ratio conversations. Choose a snack that has two distinct groups (e.g. peanuts and raisins or candy in two different colors), then try one of the following:
  - Give your student a handful and have them create a ratio to describe their snack. Ask if they can find a different ratio to represent the same group.
  - Have your student show how they can make equal groups to find equivalent simplified ratios.
- **Would You Rather?** Give your student two different ratios and ask your student which they would rather have. For example, would they rather 3 raisins : 5 peanuts or 4 raisins : 6 peanuts? Discuss how they decided by comparing the ratios.
- **Create a Measurement Conversion Table for your Kitchen.**
  - Create a table with two columns labeled teaspoons and tablespoons. Fill in the first row with 3 tsp. = 1 Tbsp. Scale up to fill in the table with equivalent measurements.
  - Create another table with four columns labeled cups, pints, quarts, and gallons. Start by filling in one row of the table with 16 cups = 8 pints = 4 quarts = 1 gallon. Scale up or down to find equivalent measurements.