Proportions

Strand:	Computation and Estimation
Topic:	Solving a proportion to find a missing term
Primary SOL:	7.3 The student will solve single-step and multistep practical problems, using proportional reasoning.

Materials

- Ratio Tables activity sheet (attached)
- Proportions activity sheet (attached)
- Proportion Grid Cards (attached)
- Scientific calculator
- Glue stick
- Scissors

Vocabulary

equivalent ration, proportion, ratio, ratio table, variable (earlier grades)

Student/Teacher Actions: What should students be doing? What should teachers be doing?

1. As a review in gathering prior knowledge, students should complete the tables on the Ratio Tables activity sheet.

2. Review solving proportions for a missing term.

3. Place students in groups of two. Distribute the Proportions activity sheet to each group, along with the Proportion Grid Cards. Have students cut out the squares associated with the first problem. Prompt students to place like labels across from each other on the proportion grid. Have the first problem displayed on the board or using a demonstration tool (e.g., document camera, digital display), and model the appropriate placement on the display. Stress that there is more than one correct way to place the labels on the proportion grid. Once the labels have been placed, have students place the numbers and variables in the appropriate place on the grid and glue them down. Once the pieces have been placed, have students solve the proportion for the missing term.

4. Have each group complete the second problem on the Proportions activity sheet without assistance.

5. Ask each group to explain how they solved the problem.

6. Give students additional problems for practice, or have students work in pairs to write a multistep problem and then trade with another pair and solve.

Assessment

- **Questions**
  - What does it mean for ratios to be proportional?
  - Can a proportion be solved in more than one way? Does it matter where the missing term is located?
  - Can you think of an experience you have had and create a ratio table that relates to it?

- **Journal/Writing Prompts**
  - Describe at least two ways to solve a proportion.
  - Explain how you can prove two ratios are proportional. Prove your explanation.
- **Other**
  - Have each student write a practical problem. Have students exchange and solve problems.

Extensions and Connections (for all students)

- Give students a chart of sports statistics to use in creating practical problems.
- Have students research the golden ratio and find examples of when it is used.
- Have students use a map, a recipe, a model car, and other items to find proportions.

Strategies for Differentiation

- Provide two or three worked examples for each activity for some students, as necessary, especially if they are not working with partners.

Note: The following pages are intended for classroom use for students as a visual aid to learning.

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Ratio Tables

Name _____ **Date** _____

1. A granola recipe requires you to use 5 cups of oats for every 3 cups of almonds. Create a ratio table to help determine how many cups of oats would be needed if you used 12 cups of almonds.

Cups of oats	5			?
Cups of almonds	3			

2. When trying to find the perfect shade of blue for his room, Joe mixed 20 parts of blue with 8 parts of black. Joe will need just a little bit more paint. How much blue will he need if he only uses 2 parts of black?

Parts of black				8
Parts of blue	n			20

3. A hybrid car can go 141 miles on 3 gallons of gasoline. Create a ratio table to find out more about the mileage a hybrid car can get.

- What information did you determine from the ratio table you created?

Proportions

Name _____ **Date** _____

José collects stamps. He has 7 used stamps for every 4 new stamps. If he has 28 new stamps, how many used stamps does he have?

_____ = _____

Proportion Grid 1

Solve:

Marcie can mow 9 lawns every 14 hours. How many lawns can she mow in 49 hours?

_____ = _____

Solve:

Proportion Grid 2

Proportion Grid Cards

Cards for Proportion Grid 1

7	4	28
New stamps	**Used stamps**	**n**
New stamps	**Used stamps**	

Cards for Proportion Grid 2

9	14	49
Lawns	**Hours**	**n**
Lawns	**Hours**	