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Unit 2, Lesson 2: Representing Ratios with Diagrams

Let's use diagrams to represent ratios.

2.1: Number Talk: Dividing by 4 and Multiplying by $\frac{1}{4}$

Find the value of each expression mentally.

$24 \div 4$

$\frac{1}{4} \cdot 24$

$24 \cdot \frac{1}{4}$

$5 \div 4$

2.2: A Collection of Snap Cubes

Here is a collection of snap cubes.

1. Choose two of the colors in the image, and draw a diagram showing the number of snap cubes for these two colors.

2. Trade papers with a partner. On their paper, write a sentence to describe a ratio shown in their diagram. Your partner will do the same for your diagram.

3. Return your partner's paper. Read the sentence written on your paper. If you disagree, explain your thinking.

2.3: Blue Paint and Art Paste

Elena mixed 2 cups of white paint with 6 tablespoons of blue paint.

Here is a diagram that represents this situation.

white paint (cups)

blue paint (tablespoons)

1. Discuss the statements that follow, and circle all those that correctly describe this situation. Make sure that both you and your partner agree with each circled answer.

   A. The ratio of cups of white paint to tablespoons of blue paint is $2 : 6$.

   B. For every cup of white paint, there are 2 tablespoons of blue paint.

   C. There is 1 cup of white paint for every 3 tablespoons of blue paint.

   D. There are 3 tablespoons of blue paint for every cup of white paint.

   E. For each tablespoon of blue paint, there are 3 cups of white paint.

   F. For every 6 tablespoons of blue paint, there are 2 cups of white paint.

   G. The ratio of tablespoons of blue paint to cups of white paint is 6 to 2.

2. Jada mixed 8 cups of flour with 2 pints of water to make paste for an art project.

   a. Draw a diagram that represents the situation.

   b. Write at least two sentences describing the ratio of flour and water.

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2.4: Card Sort: Spaghetti Sauce

Your teacher will give you cards describing different recipes for spaghetti sauce. In the diagrams:

- a circle represents a cup of tomato sauce
- a square represents a tablespoon of oil
- a triangle represents a teaspoon of oregano

1. Take turns with your partner to match a sentence with a diagram.

   a. For each match that you find, explain to your partner how you know it's a match.

   b. For each match that your partner finds, listen carefully to their explanation. If you disagree, discuss your thinking and work to reach an agreement.

2. After you and your partner have agreed on all of the matches, check your answers with the answer key. If there are any errors, discuss why and revise your matches.

3. There were two diagrams that each matched with two different sentences. Which were they?

   ○ Diagram _____ matched with both sentences _____ and _____.

   ○ Diagram _____ matched with both sentences _____ and _____.

4. Select one of the other diagrams and invent another sentence that could describe the ratio shown in the diagram.

Are you ready for more?

Create a diagram that represents any of the ratios in a recipe of your choice. Is it possible to include more than 2 ingredients in your diagram?
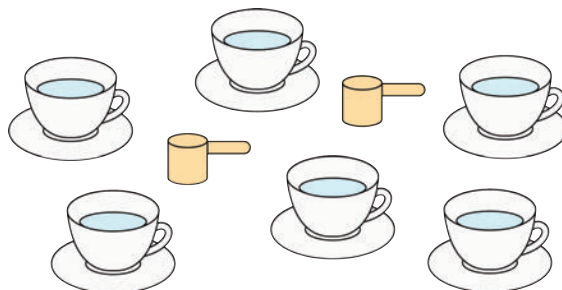
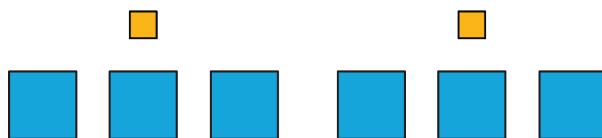NAME   DATE   PERIOD

Lesson 2 Summary

Ratios can be represented using diagrams. The diagrams do not need to include realistic details. For example, a recipe for lemonade says, "Mix 2 scoops of lemonade powder with 6 cups of water."

Instead of this:

We can draw something like this:

This diagram shows that the ratio of cups of water to scoops of lemonade powder is 6 to 2. We can also see that for every scoop of lemonade powder, there are 3 cups of water.
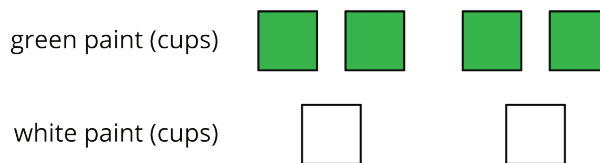
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Unit 2, Lesson 2: Representing Ratios with Diagrams

1. Here is a diagram that describes the cups of green and white paint in a mixture.

green paint (cups) ▪▪ ▪▪

white paint (cups) ▫ ▫

Select **all** the statements that accurately describe this diagram.

     A. The ratio of cups of white paint to cups of green paint is 2 to 4.
     B. For every cup of green paint, there are two cups of white paint.
     C. The ratio of cups of green paint to cups of white paint is 4 : 2.
     D. For every cup of white paint, there are two cups of green paint.
     E. The ratio of cups of green paint to cups of white paint is 2 : 4.

2. To make a snack mix, combine 2 cups of raisins with 4 cups of pretzels and 6 cups of almonds.

     a. Create a diagram to represent the quantities of each ingredient in this recipe.

     b. Use your diagram to complete each sentence.

         ▪ The ratio of _____ to _____ to _____ is _____ : _____ : _____.

         ▪ There are _____ cups of pretzels for every cup of raisins.

         ▪ There are _____ cups of almonds for every cup of raisins.

3.   a. A square is 3 inches by 3 inches. What is its area?

     b. A square has a side length of 5 feet. What is its area?

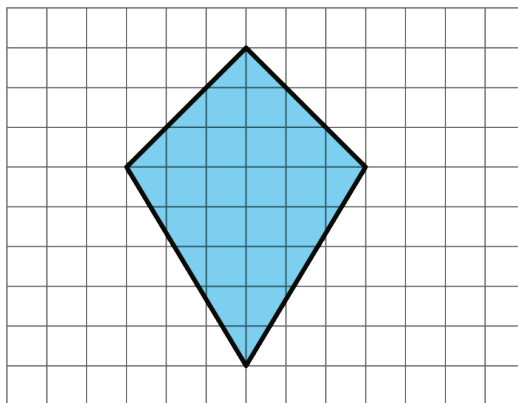   c. The area of a square is 36 square centimeters. What is the length of each side of the square?

(from Unit 1, Lesson 17)

4. Find the area of this quadrilateral. Explain or show your strategy.

(from Unit 1, Lesson 11)

5. Complete each equation with a number that makes it true.

    a. $\frac{1}{8} \cdot 8 =$ _____

    b. $\frac{3}{8} \cdot 8 =$ _____

    c. $\frac{1}{8} \cdot 7 =$ _____

    d. $\frac{3}{8} \cdot 7 =$ _____

(from Unit 2, Lesson 1)