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Unit 6.2, Family Resource

Unit 2 Summary

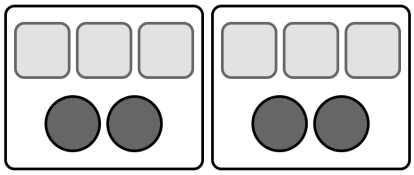
Prior Learning	Math 6, Unit 2	Future Learning
Grades 2–5 • Number lines • Equivalent fractions • Multiplicative relationships	• Introducing ratios • Equivalent ratios • Solving ratio and rate problems • Part-part-whole ratios	Math 6, Unit 3 • Unit conversions • Rates • Percentages Math 7, Unit 2 • Proportional relationships

Introducing Ratios

A ratio a: b is a relationship between two quantities.

For every a of the first quantity, there is/are b of the second quantity.

This diagram shows two circles for every three squares.



There are several ways to describe the ratio in this diagram.

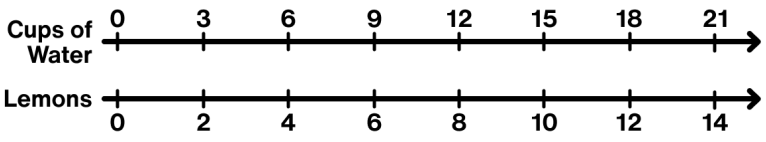
- For every 3 squares, there are 2 circles.
- The ratio of squares to circles is 3 to 2.
- The ratio of squares to circles is 3: 2.

Equivalent Ratios

Two ratios are *equivalent* if you can multiply each of the values in the first ratio by the same number to get the values in the second ratio.

For example, a recipe for lemonade uses 3 cups of water and 2 lemons. 3: 2, 6: 4, and 21: 14 are *equivalent ratios* because each ratio of water to lemons would make a drink that tastes the same.

We can represent equivalent ratios using double number line diagrams (where each set of tick marks represents an equivalent ratio) and using tables. Here is an example in a lemonade situation.



Cups of Water	Lemons
3	2
6	4
21	14

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Unit 6.2, Family Resource

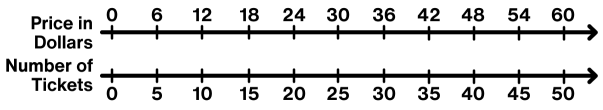
Solving Ratio and Rate Problems

There are many different strategies for solving problems with ratios.

For example, a 6th grade class is selling raffle tickets at a price of $\$6$ for 5 tickets.

We can use this double number line to answer questions like:

- *How much will it cost for* 30 *tickets?* ($\$36$)
- *How many tickets can I buy for* $\$30$*?* ($25$ tickets)



A table can be helpful for large unknown quantities and for figuring out *unit rates* (how many per 1).

We can use a table to answer questions like:

- *How much does each ticket cost?* ($\$1.20$)
- *How much do* 300 *tickets cost?* (360)
- *How many tickets could I get for* $\$120$*?* ($100$ tickets)

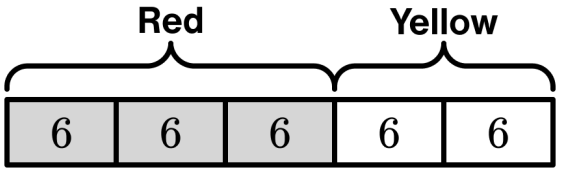
Price in Dollars	Number of Tickets
6	5
1.20	1
360	300
120	100

$\div 5$, $\cdot 300$, $\div 3$ (left) and $\div 5$, $\cdot 300$, $\div 3$ (right)

Part-Part-Whole Ratios

A shade of orange paint is made by mixing 3 cups of red paint with 2 cups of yellow paint, which makes 5 cups of orange paint. These types of ratios (where the parts of a ratio make up a whole) are called *part-part-whole ratios*.

You can represent the orange paint situation with a tape diagram divided into 3 red sections and 2 yellow sections.



If you want 30 cups of orange paint, each section represents 6 cups of paint because $6 \cdot 5 = 30$.

To make 30 cups of orange paint, you need 18 cups of red paint and 12 cups of yellow paint.

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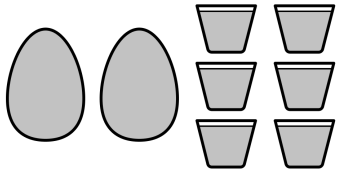
Unit 6.2, Family Resource

Try This at Home

Introducing Ratios

Here is a diagram that represents the ratio of eggs to cups of flour in a recipe for pasta.

Fill in the blanks based on this ratio.



1.1 The ratio of eggs to cups of flour is ____ to ____.

1.2 The ratio of cups of flour to eggs is ____ : ____.

1.3 For every egg, use _____ cups of flour.

1.4 Make a drawing of a new ratio: 3 eggs : 2 cups of flour.

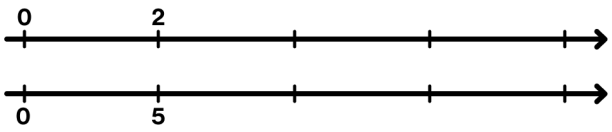
Equivalent Ratios

2.1 Select **all** of the ratios that are equivalent to $2:5$.

☐ $1:4$ ☐ $4:10$ ☐ $1:2.5$ ☐ $6:15$ ☐ $12:15$

2.2 Write a different ratio that is equivalent to $2:5$.

2.3 Complete this double number line diagram so it shows the ratio $2:5$.



Solving Ratio and Rate Problems

A train travels 45 miles in 60 minutes. At this rate:

3.1 How long would it take the train to travel 90 miles?

3.2 How far does the train travel in 12 minutes?

3.3 How far does the train travel in 150 minutes?

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Unit 6.2, Family Resource

Part-Part-Whole Ratios

4. Tyrone makes milk coffee popsicles with 4 parts coffee and 3 parts sweetened condensed milk.

   Tyrone needs 21 ounces of milk coffee to make popsicles this week.

   How much of each ingredient will he need?

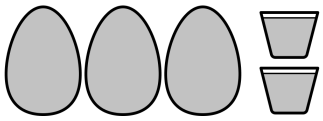
Solutions:

1.1 1 to 3 or 2 to 6

1.2 $3:1$ or $6:2$

1.3 3

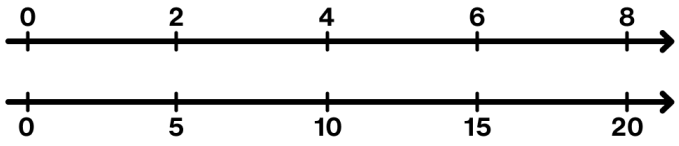
1.4 *Responses vary*.



2.1 $4:10$, $1:2.5$, $6:15$

2.2 *Responses vary*. $20:50$, $18:45$

2.3



3.1 120 minutes

3.2 9 miles

3.3 112.5 miles

4. 12 ounces of coffee and 9 ounces of sweetened condensed milk