5.2 & 5.3

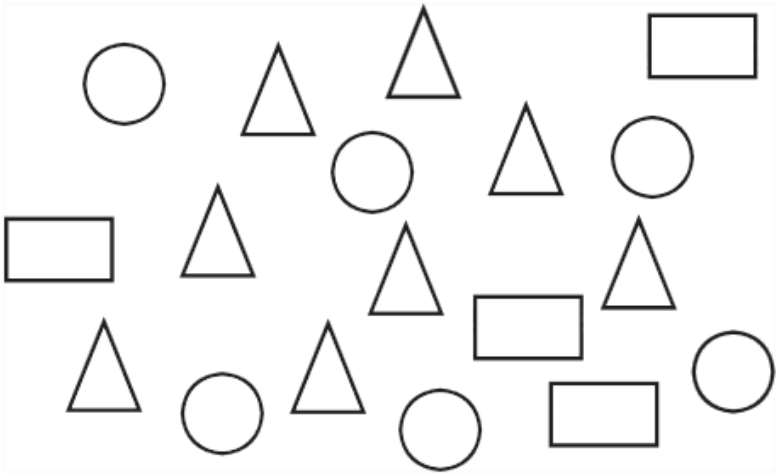
Ratio Tables & Rates

Warm Up

A ratio is a comparison of two quantities. How do ratios relate to making cookies?

Warm Up

Use the figures to write the ratio.



1. circles to triangles

2. triangles to rectangles

3. rectangles to circles

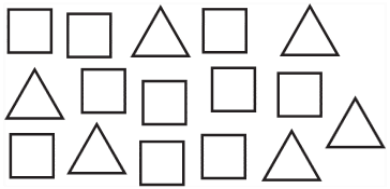
4. triangles to total number of figures

Warm Up

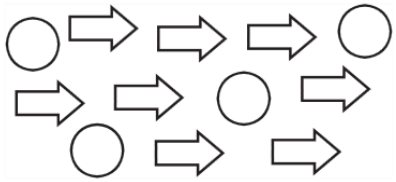
Write several ratios that describe the collection.

1. stars to hearts

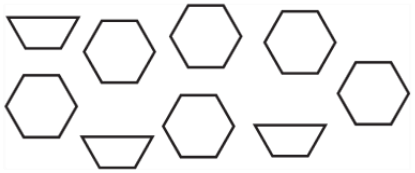
2. squares to triangles



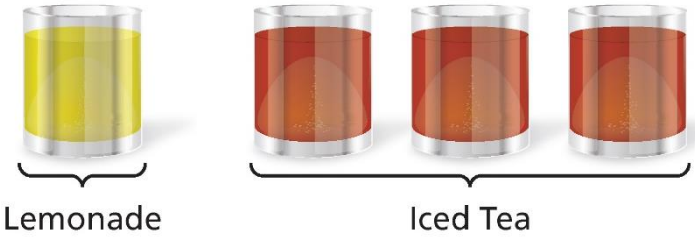
3. circles to arrows



4. trapezoids to hexagons



Exploring Ratio Tables



A mixture calls for 1 cup of lemonade and 3 cups of iced tea.

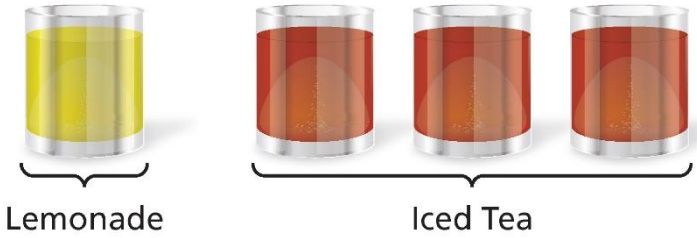
a) How many cups does this mixture contain? _____ cups

b) How do you make a larger batch of this mixture? Describe your procedure and use the table below to organize your results. Add more columns to the table if needed.

Cups of Lemonade						
Cups of Iced Tea						
Total Cups						

Exploring Ratio Tables

A mixture calls for 1 cup of lemonade and 3 cups of iced tea.

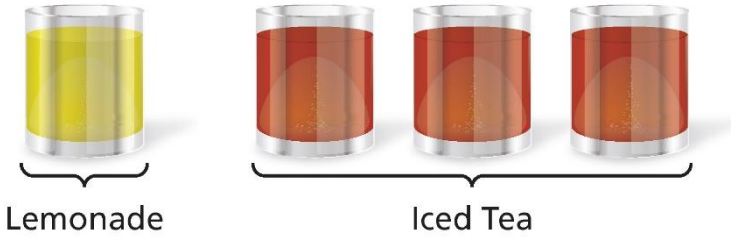


c) Suppose you take a sip from every group's final mixture. Do you think all the mixtures should taste the same? Do you think the color of all the mixtures should be the same? Explain your reasoning.

d) Why do you think it is useful to use a table when organizing your results in this activity? Explain.

Exploring Ratio Tables

A mixture calls for 1 cup of lemonade and 3 cups of iced tea.



e) A mixture contains 8 cups of lemonade. How many cups of iced tea are in the mixture?

f) A mixture contains 21 cups of iced tea. How many cups of lemonade are in the mixture?

g) A mixture has a total of 40 cups. How many cups are lemonade? How many cups are iced tea?

Ratio Tables

Find the missing value(s) in each ratio table. Then write the equivalent ratios.

a.

Pens	1	2	
Pencils	3		9

b.

Dogs	4		24
Cats	6	12	

Ratio Tables

You are making sugar water for your hummingbird feeder. A website indicates to use 4 parts of water for every 1 part of sugar. You use 20 cups of water. How much sugar do you need?

Method 1

Water (cups)					
Sugar (cups)					

Method 2

Water (cups)		
Sugar (cups)		

Application

The nutrition facts label on a box of crackers shows that there are 240 milligrams of sodium in every 36 crackers.

a. You eat 15 crackers. How much sodium do you consume?

Sodium (mg)					
Crackers					

b. You eat 21 crackers. How much sodium do you consume?

Sodium (mg)					
Crackers					

Application

You mix 3 pints of yellow paint for every 4 pints of blue paint to make green paint. You use 10 pints of blue paint. How much green paint do you make?

Yellow (pints)					
Blue (pints)					

Application

You mix 3 pints of yellow paint for every 4 pints of blue paint to make green paint. You use 10 pints of blue paint. How much green paint do you make?

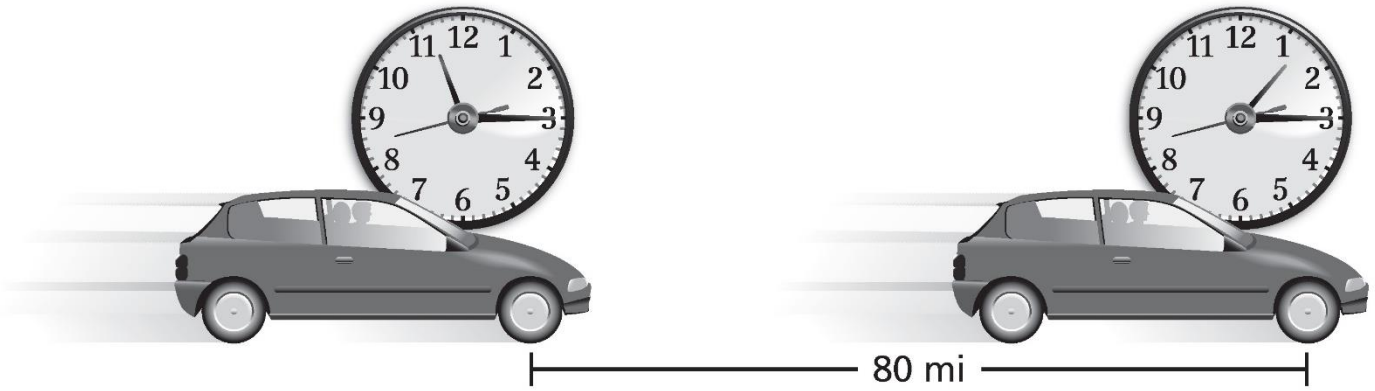
Yellow (pints)					
Blue (pints)					

Activity 1

Work with a partner. Each diagram shows a story problem.

- **Describe the story problem in your own words.**
- **Write the rate indicated by the diagram. What are the units?**

a.



Work with a partner. Each diagram shows a story problem.

- **Describe the story problem in your own words.**
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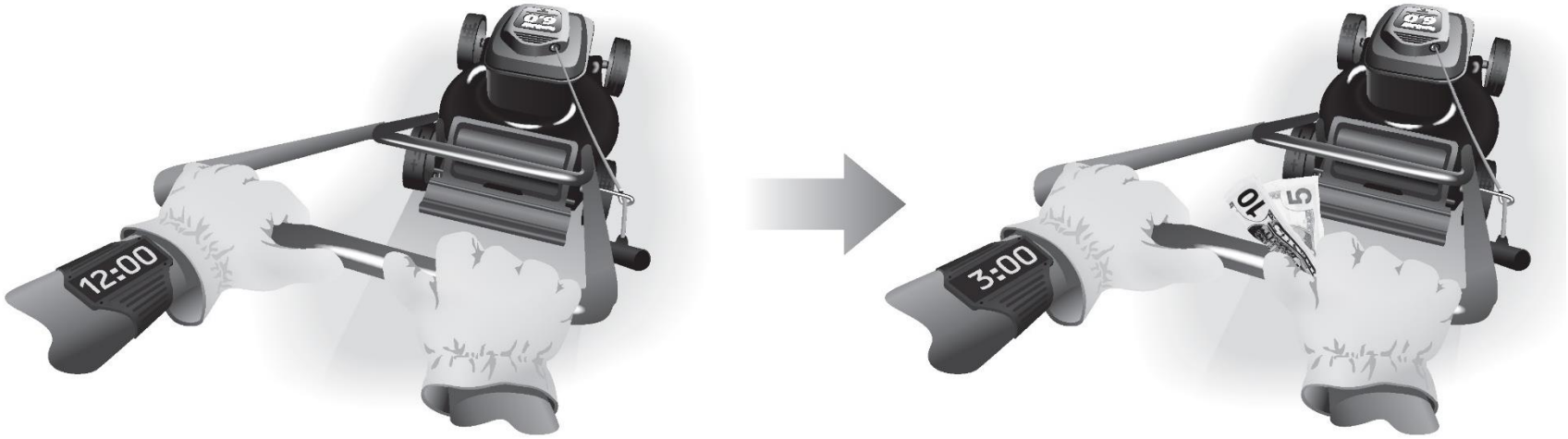
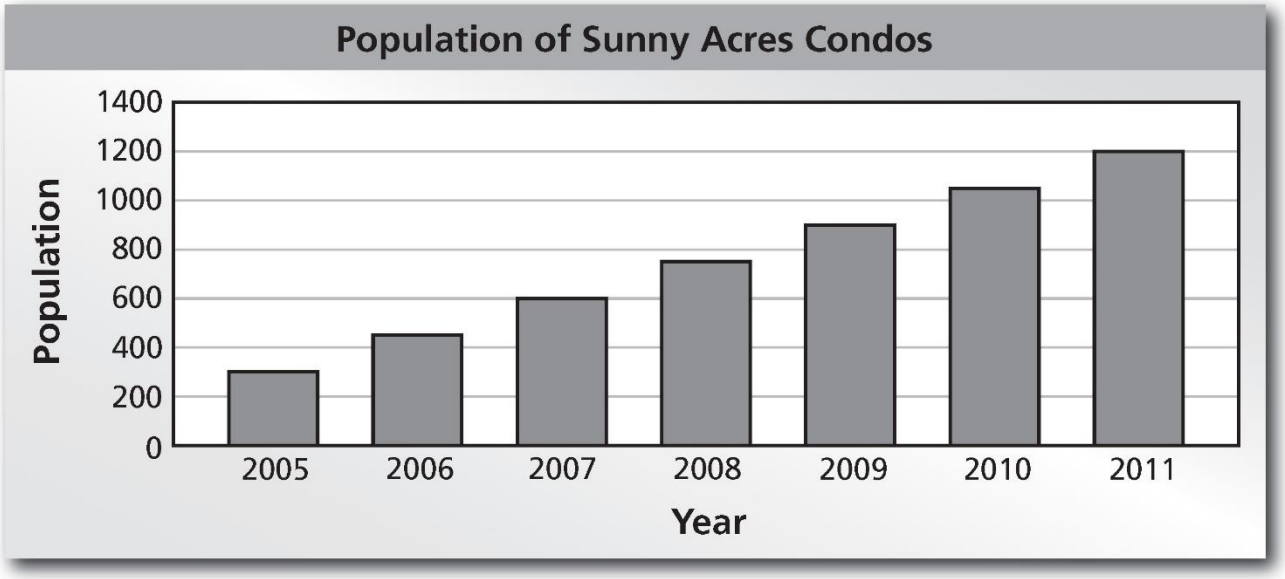
b.



Work with a partner. Each diagram shows a story problem.

- **Describe the story problem in your own words.**
- **Write the rate indicated by the diagram. What are the units?**

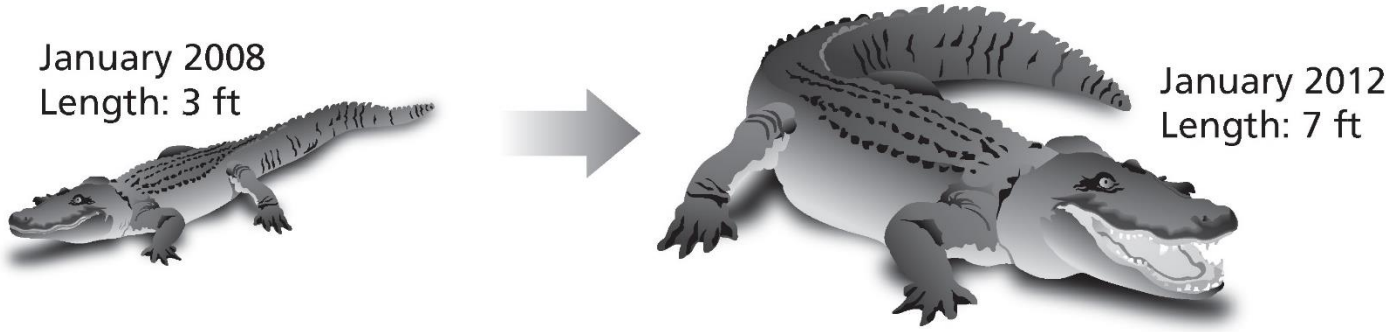
c.



Work with a partner. Each diagram shows a story problem.

- **Describe the story problem in your own words.**
- **Write the rate indicated by the diagram. What are the units?**

d.



Activity 2

Work with a partner. Use the diagrams in Activity 1. Explain how you found each answer.

a. How many miles does the car travel in 1 hour?

b. How much money does the person earn every hour?

Work with a partner. Use the diagrams in Activity 1. Explain how you found each answer.

c. How much does the population of Sunny Acres Condos increase each year?

d. How many feet does the alligator grow per year?

What are rates?

A rate is a special ratio comparing two different things.

$$\frac{15\ miles}{1\ hour}$$

$$8\ dogs : 7\ cats$$

$$17\ girls\ to\ 12\ boys$$

If you are comparing the same thing, it's just a normal ratio but not a rate.

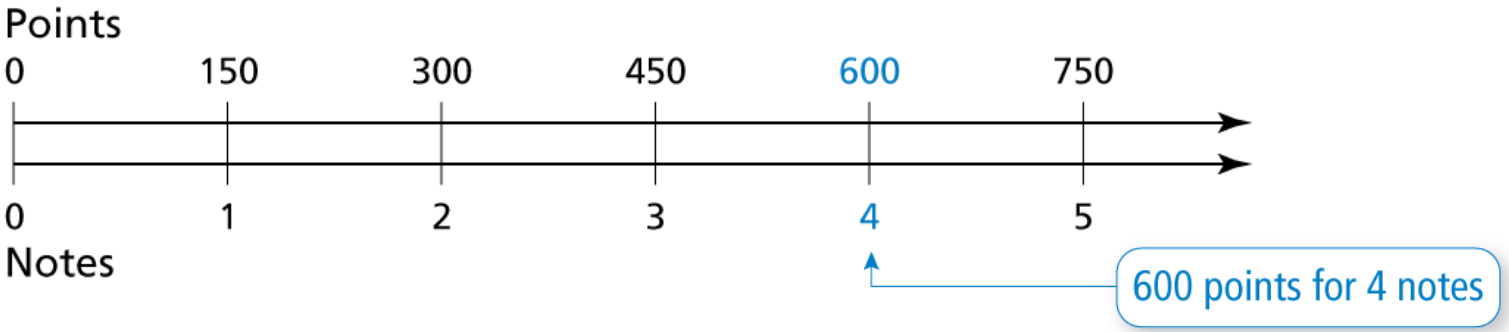
$$\frac{3\ \mathbf{min}}{15\ \mathbf{min}}$$

$$5\ cows : 7\ cows$$

Double Line Graphs and Rates

Example 1

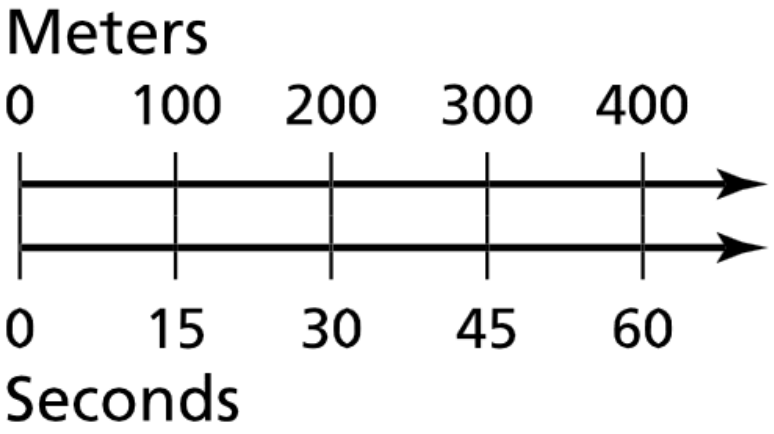
The double number line shows the rate at which you earn points for successfully hitting notes in a music video game. Write a rate that represents this situation.



Double Line Graphs and Rates

Example 2

The double number line shows the rate at which your friend runs. Write a rate that represents this situation.



UNIT RATE

A unit rate is a rate with a denominator of 1.
You use this to find how much you get for 1 thing.

Example 3

You are traveling 20 miles per hour for 4 hours. What is your unit rate?

$$\frac{20\,miles}{4\,hours}$$

Example 4

You paid $9.00 for 6 donuts. What is the unit rate for a donut?

$$\frac{\$9.00}{6\,donuts}$$

Example 5

A piece of space junk travels 5 miles in 8 seconds. How far does it travel per second?

Example 6

At mid-latitudes, Earth spins 3 miles in 10 seconds. How far does it spin per second?

Example 7

a. A chef buys 6 pounds of salmon fillets for $51. How much will the chef pay for 9 more pounds of salmon fillets?

Example 7

b. You buy 2 pounds of tilapia fillets for $16. What is the cost for 7 pounds of tilapia fillets?

Example 8

You buy 4 pounds of ground beef for $22. What is the cost for 9 pounds of ground beef?

Comparing Unit Rates

Example 4

A store sells the same pasta in two ways: 10 pounds of bulk pasta for $15.00 or 2 pounds for packaged pasta for $3.98. Which one is the better buy? (Which one is cheaper for the unit rate?)

$$\frac{\$15.00}{10\,lbs}$$

$$\frac{\$3.98}{2\,lbs}$$

Practice

1) You biked 68 miles in 4 days. Find the unit rate.

2) It takes you 1 minute 40 seconds to walk 550 feet. What is your average speed?

Practice

3) Which is the better buy: 2 batteries for $1.00 or 6 batteries for $4.80?