5.3

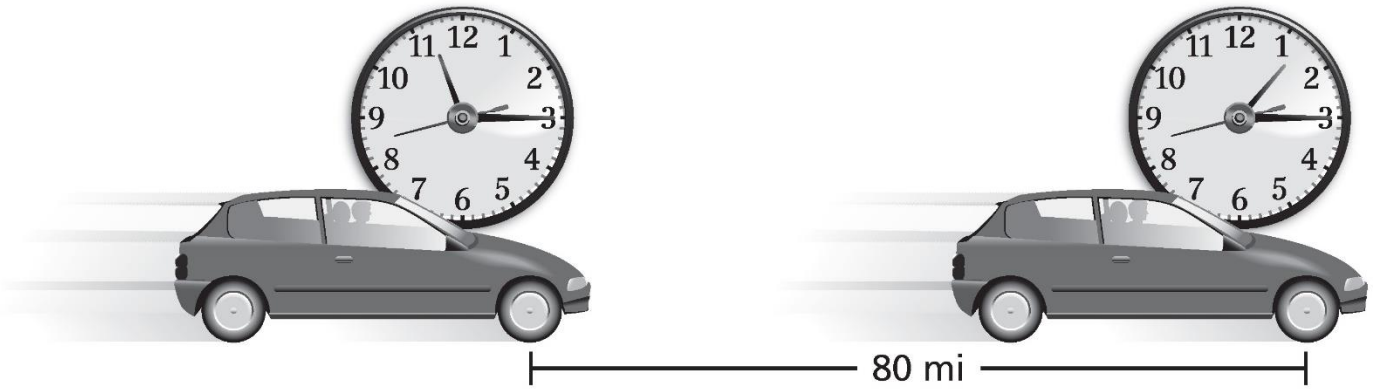
Rates

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?**

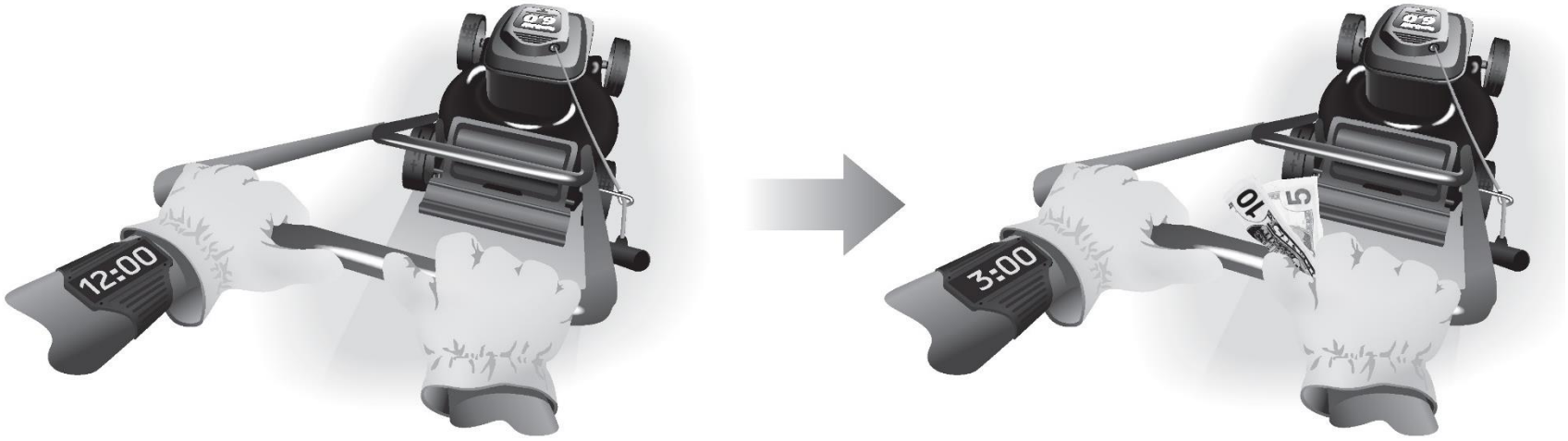
a.



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

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

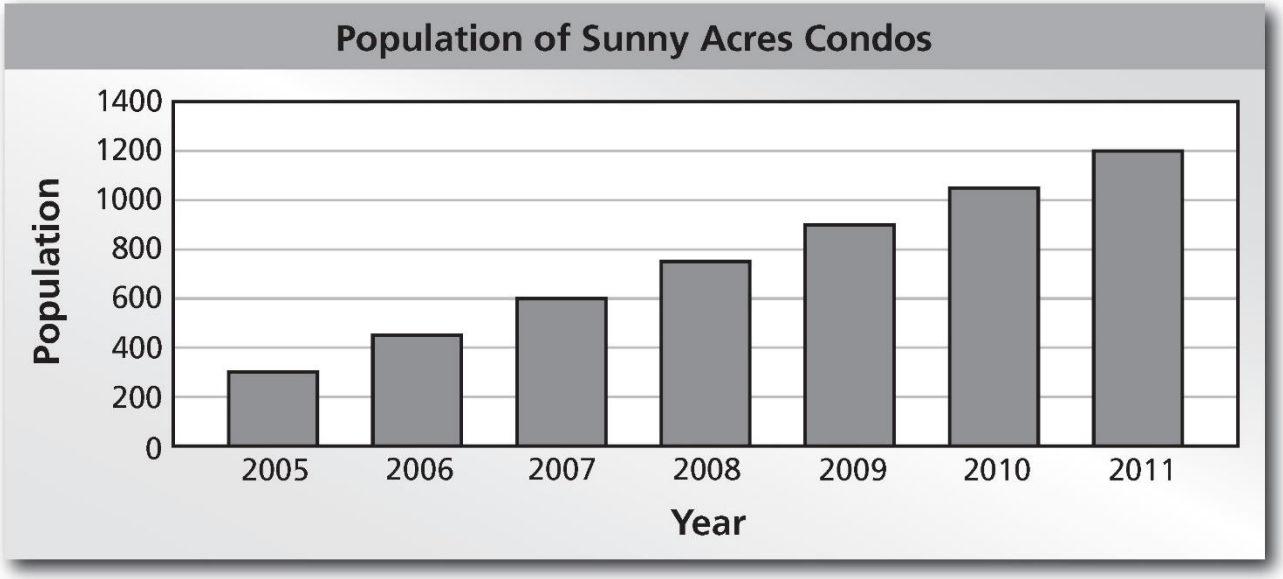
b.



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?**

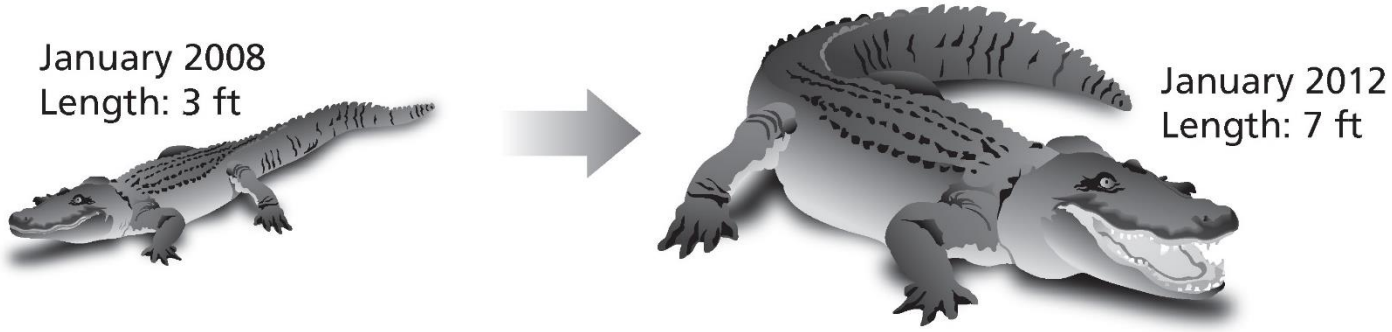
c.



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.

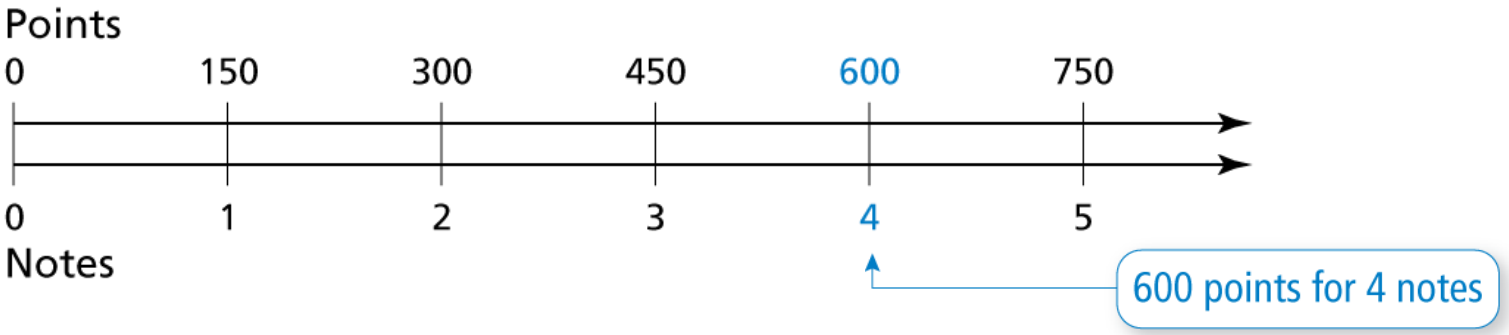
$$\frac{3\,\mathbf{min}}{15\,\mathbf{min}}$$

$$5\,cows : 7\,cows$$

Double Line Graphs and Rates

Example 1

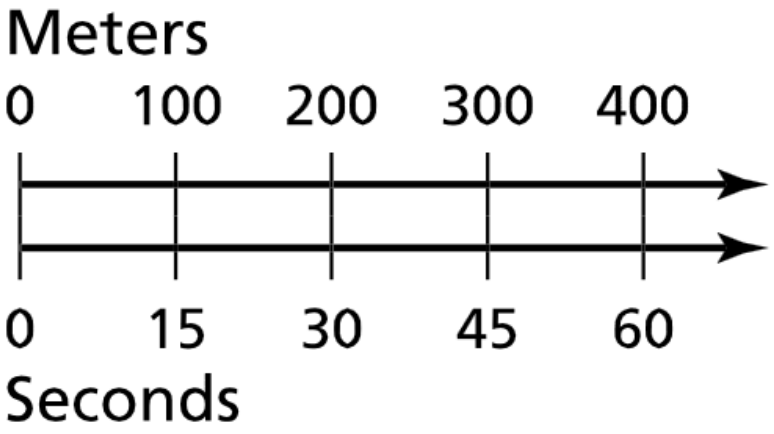
The double number line shows the rate at which you earn points for successfully hitting notes in a music video game. Write a rate that represents this situation.



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?