

## Math 7H - Unit 3

## Day 3 - Convert Unit Rates

## Lesson Objectives:

- I can compute unit rates with like and different units.

The relationship among some commonly used customary and metric units of measure are shown in the tables below.

Customary Units of Measure		Metric Units of Measure	
Smaller	Larger	Smaller	Larger
12 inches	1 foot	100 centimeters	1 meter
16 ounces	1 pound	1,000 grams	1 kilogram
8 pints	1 gallon	1,000 milliliters	1 Liter
3 feet	1 yard	10 millimeters	1 centimeter
5,280 feet	1 mile	1,000 milligrams	1 gram

What careers typically use customary units of measure?

What careers typically use metric units of measure?

You can convert one rate to an equivalent rate by multiplying by a unit rate or its reciprocal. When you convert rates, you include the units in your computation.

A remote control car travels at a rate of 10 feet per second. How many inches per second is this?

$$\frac{10 \cancel{\text{ft}}}{1 \cancel{\text{sec}}} \cdot \frac{12 \cancel{\text{in}}}{1 \cancel{\text{ft}}} = \frac{120 \cancel{\text{in}}}{1 \cancel{\text{sec}}} = 120 \text{ in/sec}$$

Marvin walks at a speed of 7 feet per second. How many feet per hour is this?

$$\frac{7 \cancel{\text{ft}}}{1 \cancel{\text{sec}}} \cdot \frac{60 \cancel{\text{sec}}}{1 \cancel{\text{min}}} \cdot \frac{60 \cancel{\text{min}}}{1 \cancel{\text{hr}}} = \frac{25200 \cancel{\text{ft}}}{1 \cancel{\text{hr}}} = 25,200 \text{ ft/hr}$$

$$\frac{7 \cancel{\text{ft}}}{1 \cancel{\text{sec}}} \cdot \frac{3600 \cancel{\text{sec}}}{1 \cancel{\text{hr}}} = \frac{25200 \cancel{\text{ft}}}{1 \cancel{\text{hr}}} = 25,200 \text{ ft/hr}$$

The average speed of one team in a relay race is about 10 miles per hour. What is this speed in feet per second?

$$\frac{10 \cancel{\text{mi}}}{1 \cancel{\text{hr}}} \cdot \frac{5280 \cancel{\text{ft}}}{1 \cancel{\text{mi}}} \cdot \frac{1 \cancel{\text{hr}}}{60 \cancel{\text{min}}} \cdot \frac{1 \cancel{\text{min}}}{60 \cancel{\text{sec}}} = \frac{52800 \cancel{\text{ft}}}{3600 \cancel{\text{sec}}} = 14.6 \text{ ft/sec}$$

A car travels at an average speed of 60 miles per hour on a trip. What is the car's speed in yards per second?

$$\frac{60 \cancel{\text{miles}}}{1 \cancel{\text{hr}}} \cdot \frac{1 \cancel{\text{hr}}}{60 \cancel{\text{min}}} \cdot \frac{1 \cancel{\text{min}}}{60 \cancel{\text{sec}}} \cdot \frac{5280 \cancel{\text{ft}}}{1 \cancel{\text{mi}}} \cdot \frac{1 \cancel{\text{yd}}}{3 \cancel{\text{ft}}} = \frac{31680 \cancel{\text{ft}}}{3600 \cancel{\text{sec}}} = 8.8 \text{ yd/sec}$$

$$\frac{60 \cancel{\text{miles}}}{1 \cancel{\text{hr}}} \cdot \frac{1760 \cancel{\text{yds}}}{1 \cancel{\text{mi}}} \cdot \frac{1 \cancel{\text{hr}}}{3600 \cancel{\text{sec}}} = \frac{10560 \cancel{\text{yds}}}{3600 \cancel{\text{sec}}} = 2.93 \text{ yds/sec}$$

## Homework

## Converting Unit Rates WKS

## \* Individual Think Time \*



What to do if you get stuck...

- Reread the problem. Did you write it down correctly?
- Reread your notes. Is there a problem similar that we did together in class?
- Find a problem similar in your book. Try this one to see if it helps.
- Skip the problem until the end of Individual Think Time. Then ask an "educated" question of a neighbor or Mrs. Call.

Today we're working by...

