I can ***solve real world proportionality problems.***

Ohio State Test Reference Sheet
Grades 6 and 7

1 mile = 1,760 yards	1 pound = 16 ounces	1 cup = 8 fluid ounces
1 mile = 5,280 feet		1 pint = 2 cups
		1 quart = 2 pints
		1 gallon = 4 quarts
1 kilometer = 1,000 meters	1 kilogram = 1,000 grams	1 liter = 1, 000 milliliters
1 meter = 100 centimeters		
1 centimeter = 10 millimeters		

Conversions Review

Example 1) Anna is 152 centimeters tall. How tall is she in meters?

$$\frac{152\ \text{cm}}{1} \cdot \frac{1\ \text{m}}{100\ \text{cm}} = 1.52\ \text{m}$$

Example 2) The barrel weighs 58 pounds. What is its weight in ounces?

$$\frac{58\ \text{lbs}}{1} \cdot \frac{16\ \text{oz}}{1\ \text{lb}} = 928\ \text{oz}$$

Converting Unit(s) in a Unit Rate

3.) Mia walks her dog $\frac{5}{6}$ of a mile in 40 minutes. What is Mia's unit rate of speed in miles per hour?

$$\frac{\frac{5}{6}\ \text{mi}}{40\ \text{min}} \cdot \frac{60\ \text{min}}{1\ \text{hr}} = 1.25\ \text{mph}$$

4.) An 8-pint container of window cleaner costs $13.44. What is the price per quart?

$$\frac{\$13.44}{8\ \text{pint}} \cdot \frac{2\ \text{pint}}{1\ \text{quart}} = \$3.36\ \text{per quart}$$

5.) A car is traveling at 55 miles per hour. What is this speed in yards per minute?

$$\frac{55\ \text{mi}}{1\ \text{hr}} \cdot \frac{1760\ \text{yd}}{1\ \text{mi}} \cdot \frac{1\ \text{hr}}{60\ \text{min}}$$

6.) A barrel is filled at a rate of 10 ounces per second. What is this rate in cups per minute?

$$\frac{10\ \text{oz}}{1\ \text{sec}} \cdot \frac{1\ \text{cup}}{8\ \text{oz}} \cdot \frac{60\ \text{sec}}{1\ \text{min}} = 75\ \text{cups per min}$$

Challenge: $1613.\overline{3}$ yd per min

A child walks 1.2 kilometers per hour. What is this rate in centimeters per second?

$$\frac{1.2\ \text{km}}{1\ \text{hr}} \cdot \frac{1000\ \text{m}}{1\ \text{km}} \cdot \frac{100\ \text{cm}}{1\ \text{m}} \cdot \frac{1\ \text{hr}}{60\ \text{min}} \cdot \frac{1\ \text{min}}{60\ \text{sec}} = 33.\overline{3}\ \text{cm per sec}$$

Practice:

1.) 8-quarts of milk cost $9.68. What is the cost per quart?

$$\frac{\$9.68}{8\text{ qt}} = \$1.21 \text{ per quart}$$

2.) A 2-gallon container of laundry detergent costs $12.48. What is the price per cup?

$$\frac{\$12.48}{2\text{ gal}} \cdot \frac{1\text{ gal}}{4\text{ qt}} \cdot \frac{1\text{ qt}}{2\text{ pints}} \cdot \frac{1\text{ pt}}{2\text{ cups}} = \$0.39 \text{ per cup}$$

3.) Jeannette drives 73,920 yards in 1 hour and 15 minutes. What is her speed in **miles per hour?**

$$\frac{73920\text{ yd}}{1.25\text{ hr}} \cdot \frac{1\text{ mi}}{1760\text{ yd}} = 33.6 \text{ mph}$$

4.) The pilot of a small aircraft was given permission to land, and she lowered the wheels at an altitude of 630 yards. Three and a half minutes after lowering the wheels, the aircraft landed. What was the plane's rate of descent, in **feet per second**, from the time the wheels were lowered to the time the plane landed?

$$\frac{630\text{ yd}}{3.5\text{ min}} \cdot \frac{3\text{ ft}}{1\text{ yd}} \cdot \frac{1\text{ min}}{60\text{ sec}} = 9 \text{ ft per sec}$$

Comparing Unit Rates (Better Buy)

1.) Which is the better buy?

A) 7-ounce bottle of BBQ sauce for $2.03

B) 2-pound bottle of BBQ sauce for $16.32

Better → A = $0.29 per oz

$$B = \frac{\$8.16}{1\text{ pound}} \cdot \frac{1\text{ pound}}{16\text{ oz}} = \$0.51 \text{ per oz}$$

2.) Which is the better buy?

A) A gallon of ice cream for $7.24

B) A pint of ice cream for $1.50

Better → $A = \frac{\$7.24}{1\text{ gal}} \cdot \frac{1\text{ gal}}{8\text{ pint}} = \$0.91$ per pint

B = $1.50 per pint

Word Problems

After a game, Coach Larson wants to serve punch to the players on her soccer team. She will mix 1 quart of ginger ale and 1 gallon of fruit punch together. If she plans give each player 8-ounces per servings, how many players will get a drink?

1 gal + 1 quart

$$\frac{1\text{ qt}}{4\text{ qt}} \cdot \frac{1\text{ gal}}{} = \frac{1}{4}\text{ gal}$$

$$\frac{1.25\text{ gal}}{1\text{ gal}} \cdot \frac{128\text{ oz}}{} = 160\text{ oz}$$

$$\frac{160\text{ oz}}{8\text{ oz}} = 20 \text{ players}$$