

DELTA MATH SCIENCE PARTNERSHIP INITIATIVE

M³ Summer Institutes

(Math, Middle School, MS Common Core)

Measurement Conversions

Common Core State Standards:

6.RP.3.d

Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

7.RP.1

Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour.*

7.RP.2.a,b

- Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
- Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

8.F.5

Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Hook Problem: Susie plans to carpet her den which measures 12 feet by 18 feet. The carpet she chose costs \$15.99 per square yard. How much will it cost Susie to carpet her den?

Final Answer:

Multiplicative Identity: $\frac{a}{b} \cdot 1 = \frac{a}{b}$

Identity: $\frac{1}{3} \cdot 1 = \frac{1}{3}$

Multiplicative Inverse: $\frac{a}{b} \cdot \frac{b}{a} = 1$

$\frac{1}{3} \cdot \frac{7}{7} = \frac{7}{21} = \frac{1}{3}$

- $1, \frac{4}{4}, \frac{c}{c}, \frac{4+6}{10}, \frac{3^2}{9}$ all equal 1

Equivalent Measures:

$$\frac{12in}{1ft}$$

$$\frac{1ft}{12in}$$

$$\frac{100cm}{1m}$$

$$\frac{1m}{100cm}$$

$$\frac{3ft}{1yd}$$

$$\frac{1yd}{3ft}$$

$$\frac{1,000m}{1km}$$

$$\frac{1km}{1,000m}$$

$$\frac{5,280ft}{1mi}$$

$$\frac{1mi}{5,280ft}$$

$$\frac{8oz}{1c}$$

$$\frac{1c}{8oz}$$

$$\frac{4qt}{1gal}$$

$$\frac{1gal}{4qt}$$

$$\frac{2c}{1pt}$$

$$\frac{1pt}{2c}$$

$$\frac{16oz}{1lb}$$

$$\frac{1lb}{16oz}$$

$$\frac{2pt}{1qt}$$

$$\frac{1qt}{2pt}$$

$$\frac{2,000lbs}{1T}$$

$$\frac{1T}{2,000lbs}$$

Solve:

1. A piece of ribbon 72 inches long can be cut into how many 1 foot long pieces?
2. 2,500 cm equals how many meters?
3. 5 miles equals how many yards?

4. 25,600,000 inches equals how many miles?

5. 24 cups equals how many quarts?

Model solutions to the Hook Problem.

Graphing:

1. Joe ran 6 miles in 2 hours the first week. The second week, he ran 21 miles in 7 hours. The third week he ran for 5 hours and covered 15 miles. Graph this data.

2. How many minutes will it take Joe to run $1\frac{1}{2}$ miles?

Extension: Convert 60 mph to feet per second.