

Day 8: Rate Conversions

On Day 1, you learned what a rate is. Redefine what a rate is and then name a few examples.

~~Rate~~ a comparison of 2 quantities with different units

Examples:

$$\frac{60 \text{ mi}}{2 \text{ hrs}} \quad \text{or} \quad \frac{1 \text{ gal}}{40 \text{ sec}}$$

$$45 \text{ mph} = \frac{45 \text{ miles}}{1 \text{ hr}}$$

* per -- means divide
* can be just a one

Most of the rates we are going to discuss today include both an amount and a time frame such as miles per hour or words per minute. When we convert our rates, we are going to change the units in **both** the numerator and denominator.

a. Mrs. Dombrowski can run about 2 miles in 16 minutes. How fast is she running in miles per hour?
mi → mi (no change) min → hr

$$\frac{2 \text{ mi}}{16 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \rightarrow \frac{120 \text{ min}}{16 \text{ hr}} \rightarrow \boxed{7.5 \text{ miles per hour}}$$

b. Convert 36 inches per second to miles per hour.
inches → ft → miles seconds → min → hr

$$\frac{36 \text{ in}}{1 \text{ sec}} \times \frac{1 \text{ ft}}{12 \text{ in}} \times \frac{1 \text{ mi}}{5280 \text{ ft}} \times \frac{60 \text{ sec}}{1 \text{ min}} \times \frac{60 \text{ min}}{1 \text{ hr}} \rightarrow \frac{129600 \text{ mi}}{63360 \text{ hr}} \rightarrow \boxed{2.05 \text{ mi/hr}}$$

c. Convert 45 miles per hour to feet per minute. mi → ft, hr → min

$$\frac{45 \text{ mi}}{1 \text{ hr}} \times \frac{5280 \text{ ft}}{1 \text{ mi}} \times \frac{1 \text{ hr}}{60 \text{ min}} \rightarrow \frac{237600 \text{ ft}}{60 \text{ min}} \rightarrow \boxed{3960 \text{ ft/min}}$$

