1.1 Proportional Reasoning

Guided Notes

A ratio is _Compares   2 or more things._   eg 4:2

A proportion is _2 ratios with an equal sign_   eg. $\frac{2}{4} = \frac{x}{3}$

multiply the pair, divide by the spare

Examples:
1. A nurse has to administer 300 mg of a drug that comes in a vial that has 120 mg of the drug dissolved in 2 mL of fluid. How many mL of fluid will she need to give her patient?

$$\frac{300}{120} = \frac{x}{2mL}$$

$$x = 5 mL$$

2. Engines that require you to mix oil with fuel to provide lubrication are called 2-stroke engines. A faller at a logging site needs to refill a chainsaw's fuel can. The ratio of gasoline to oil that is needed is 40 parts of gasoline to 1 part of oil. The chainsaw's fuel can holds 8 litres of gasoline. How much oil should be added to the gasoline to obtain the correct ratio?

$$\frac{40 \, gas}{1 \, oil} = \frac{8}{x}$$

$$x = 0.2$$

3. Jean-Luc a builder, has found that he can arrange the work cubicles of his employees best if the ratio between the length and the width of a room is 3:2. If a room is 6 m long, how wide should the room be?

$$\frac{3 \, length}{2 \, width} = \frac{6m}{x}$$

$$x = 4 m$$

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A rate is **compares an amout to 1**
✱with g, compare to 100.

Some real world examples are: **$1.46/L   70 km/h**

Examples:
1. If salmon costs $1.89 for 100 g, how much will it cost to buy 250g of salmon?

$$\frac{\$1.89}{100g} = \frac{x}{250g} \qquad x = \$4.73$$

2. A local plumbing store sells 100 copper-plated pipe straps for $4.97. You have estimated that you require 75 straps. How much will you pay for 75 straps

$$\frac{100}{\$4.97} = \frac{75}{x} \qquad\qquad \frac{100}{75} = \frac{4.97}{x}$$
$$x = \$3.73 \qquad\qquad x = \$3.73$$

3. If you earn $150.00 in 12 hours, how much will you earn if you work 40 hours?

$$\frac{\$150}{12} = \frac{x}{40}$$
$$x = \$500$$