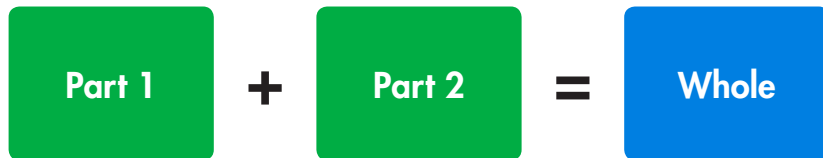


PART-PART-WHOLE



DIFFERENCE



CHANGE or JOIN



CHANGE or SEPARATE



Greater and **less** amounts compared for a **difference**

$$G - L = D$$

Example: Amanda has **86.77** fewer centimeters of ribbon than Shinead. Shinead has **90.82** centimeters of ribbon. How much ribbon does Amanda have?

$$90.82 \text{ cm} - X = 86.77 \text{ cm}$$

(Answer: $X = 4.05$ centimeters)

Parts put together into a **whole**

$$P1 + P2 = W$$

Example: On Friday, **1,045** tickets were purchased for a concert and **998** tickets were purchased for a basketball game. How many tickets were sold on Friday?

$$1,045 + 998 = X$$

(Answer: $X = 2,043$ tickets)

An amount that **decreases** over time

$$ST - C = E$$

Example: Micaela had $9\frac{1}{3}$ yards of fabric. She used $2\frac{1}{2}$ yards of the fabric to make a skirt. How much fabric does Micaela have now?

$$9\frac{1}{3} \text{ yards} - 2\frac{1}{2} \text{ yards} = X$$

(Answer: $X = 6\frac{5}{6}$ yards)

An amount that **increases** over time

$$ST + C = E$$

Example: Shannah had **\$44.03** in her bank account. Then, she received **\$7.25** for selling some items at a garage sale. How much money does Shannah have now?

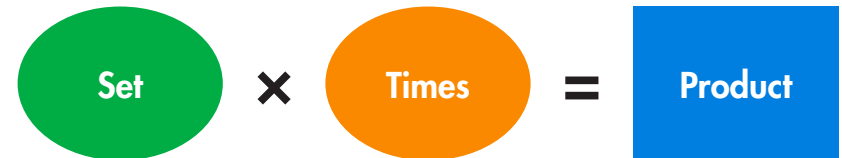
$$\$44.03 + \$7.25 = X$$

(Answer: $X = \$51.28$)

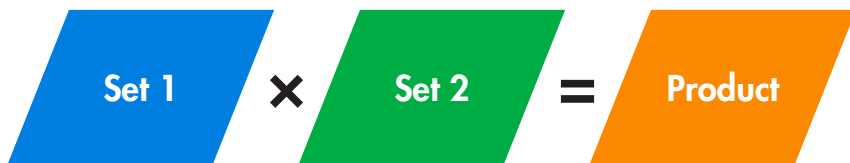
EQUAL GROUPS



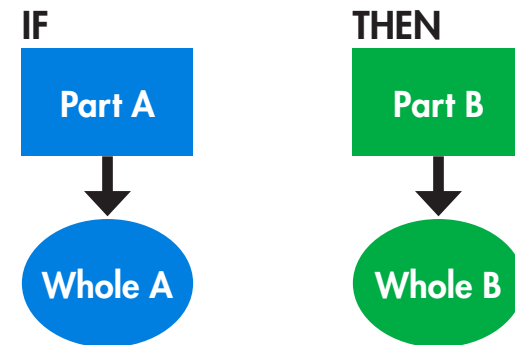
COMPARISON



COMBINATIONS



RATIOS and PROPORTIONS



Set multiplied by a number of **times** for a **product**

$$S \times T = P$$

Example: Jill filled $6\frac{1}{2}$ gallons of bottled water. Mark filled 7 times as many gallons as Jill. How many gallons did Mark fill?

$$6\frac{1}{2} \text{ gallons} \times 7 = X$$

$$\text{(Answer: } X = 45\frac{1}{2} \text{ gallons)}$$

Groups multiplied by the **number in each group** for a **product**

$$G \times N = P$$

Example: Sam has 17 rolls of dimes. There are 50 dimes in each roll. How many dimes does Sam have altogether?

$$17 \times 50 = X$$

$$\text{(Answer: } X = 850 \text{ dimes)}$$

A **ratio** is a comparison between two things.
A **proportion** is a statement that two ratios are equal.

$$\frac{\text{Part}}{\text{Whole}} = \frac{\text{Part}}{\text{Whole}}$$

Example: Melody can read 14 pages in 42 minutes. How many minutes would it take her to read 3 pages?

$$\frac{14 \text{ pages}}{42 \text{ minutes}} = \frac{3 \text{ pages}}{X \text{ minutes}}$$

$$\text{(Answer: } X = 9 \text{ minutes)}$$

One set multiplied by **another set** for a **product**

$$S1 \times S2 = P$$

Example: Alex has 12 shirts and 8 shorts. How many different outfits can he put together with one shirt and one pair of shorts?

$$12 \times 8 = X$$

$$\text{(Answer: } X = 96 \text{ outfits)}$$