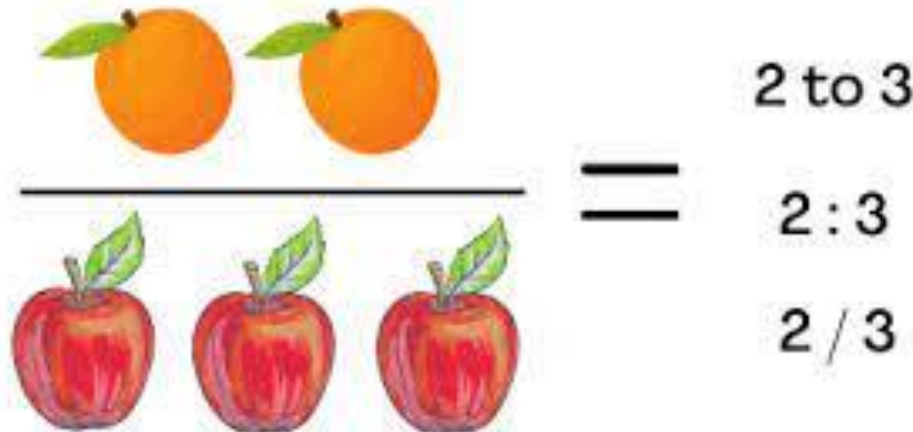# Grade 7
Unit 3 Vocabulary

Linear Relationships

(7.4A, 7.4B, 7.4C, 7.4D, 7.4E, 7.7A)

Ratio – a comparison of two quantities. Can be written three ways… to, fraction , or :

Comparison of the **same** units

Apples and oranges are BOTH fruit.

$$2 \text{ to } 3$$
$$2:3$$
$$2/3$$

**Rate** — a multiplicative comparison of two different quantities where the measuring unit is different for each quantity.

Comparison of **different** units

3000 ml over 6 hours

$$\frac{3000}{6} = 500 \text{ ml/hr}$$

Unit rate – a rate between two different units where one of the terms is equal to one.

Rate with a denominator of 1

Rates and Unit Rates:

$$\frac{60 \text{ miles}}{3 \text{ hours}} \quad \frac{20 \text{ miles}}{1 \text{ hour}} = 20 \text{ miles/hour}$$

$$\frac{40 \text{ words}}{2 \text{ min.}} \quad \frac{20 \text{ words}}{1 \text{ min.}} = 20$$
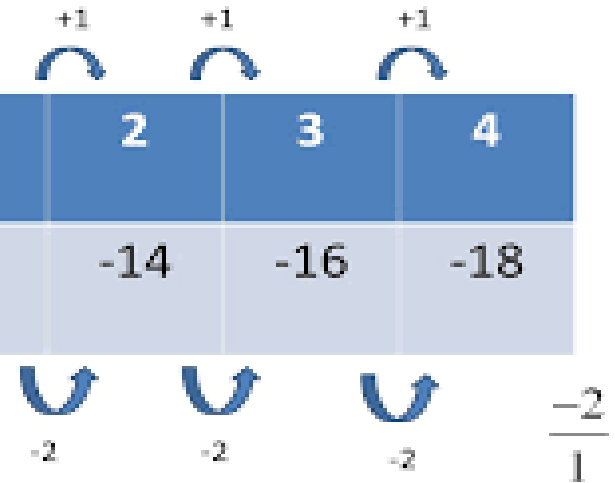
Rate of change – m, the ratio that describes how one quantity changes in relation to another quantity. Also called Constant Rate of Change or CRoC.

How the two units are changing together.

Find the Constant Rate of Change in the table

	+1	+1		+1
Hours (x)	1	2	3	4
Feet (y)	-12	-14	-16	-18

$\frac{change \cdot in \cdot y}{change \cdot in \cdot x}$

-2   -2   -2

$\frac{-2}{1}$

Constant of proportionality (CoP) – k, the constant rate of change between x and y in a proportional relationship. $k = y/x$

The rate of change when you have a proportional relationship
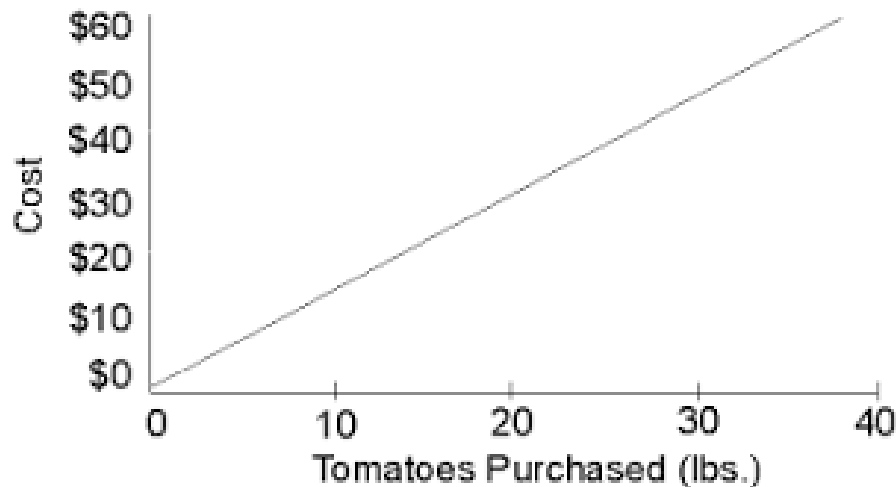

x	5	2	3	4
Y	60	24	36	48

$$K = \frac{y}{x} = \frac{24}{2} = \frac{12}{1} = 12$$

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Linear- a relationship between two quantities in which a constant rate of change exists. The points will form a straight line when graphed. The $y = mx + b$ equation.
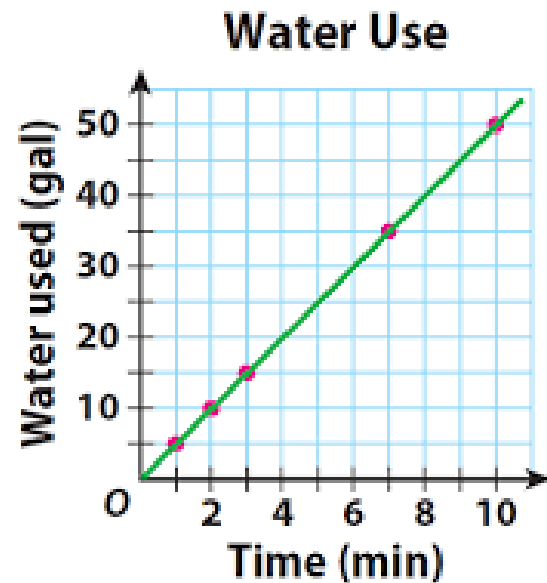
A relationship that makes a **straight** line when graphed

*Proportional* – Two variables are proportional if their ratio is constant. The relationship must include (0, 0).

A graph or table that included the origin (0,0)

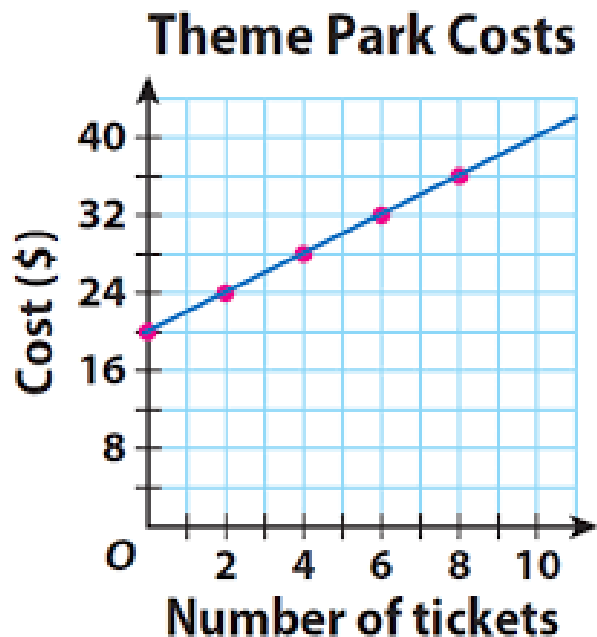| x	0	5	
y	0	8	32

Water Use

Non-Proportional – a linear relationship is non-proportional if it has a constant rate of change but does NOT pass through the origin.

A graph or table that DOES NOT included the origin (0,0)

x	y
0	6
3	9
6	12
9	15
12	18

Theme Park Costs

Equivalent ratios – Two ratios (fractions) that are equal values. They are used in Proportions.

Two equal fractions (in a proportion)

Scale factor- a number multiplied by the numerator and denominator of a ratio to create an equivalent ratio.

The number you multiply by to get two equal fractions

$$\frac{4 \times 10}{10 \times 10} = \frac{40}{100}$$