

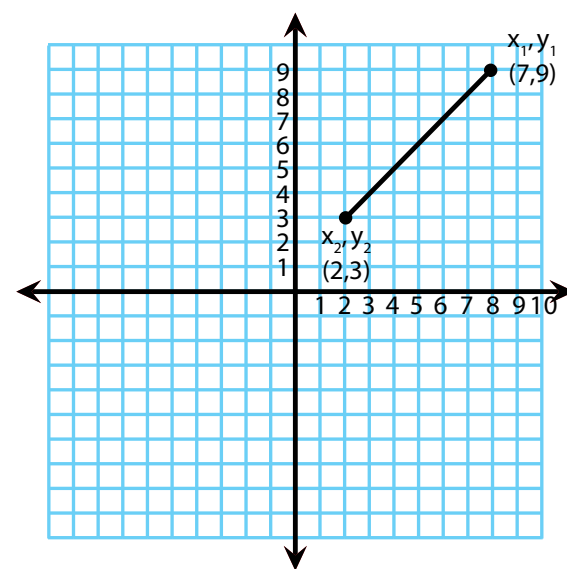
CONNECTIONS ACROSS THE CURRICULUM: Slope, Rate of Change, Gradient

MATHEMATICS

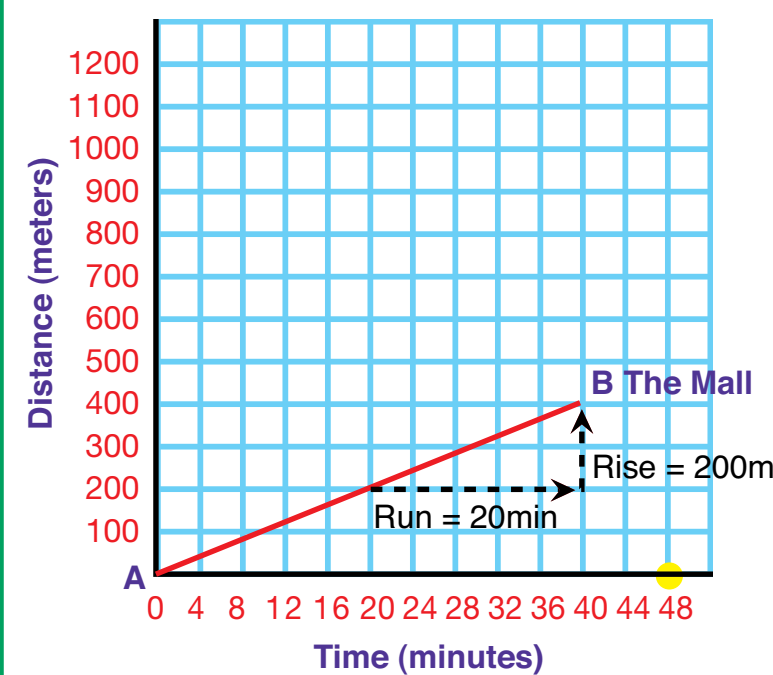
Calculate slope given two points on a line:

$$\text{Slope} = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = m$$

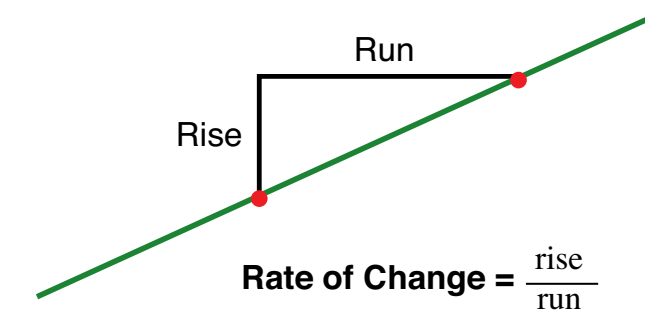
$$m = \frac{9-3}{7-2} = \frac{6}{5}$$



The greater the slope or rate of change, the steeper the line on the graph.



Rate of Change of a Linear Relationship



The **rate of change** of a linear relationship is the **steepness** of the line.

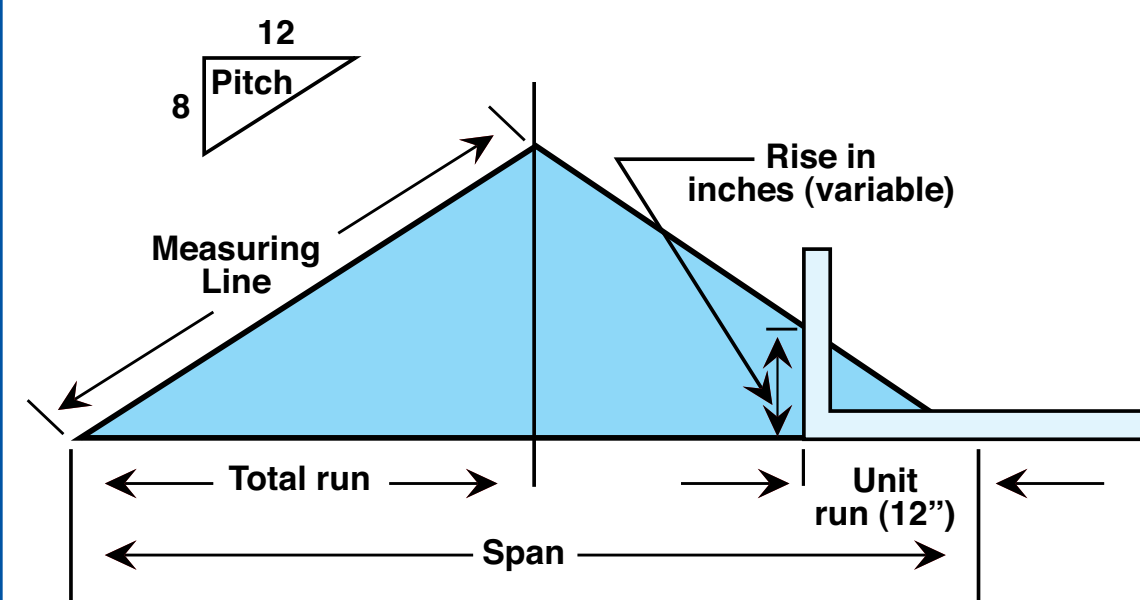
$$\text{Rate of Change} = \frac{\text{rise}}{\text{run}}$$

$$\text{Rate of Change} = \frac{200 \text{ m}}{20 \text{ min}}$$

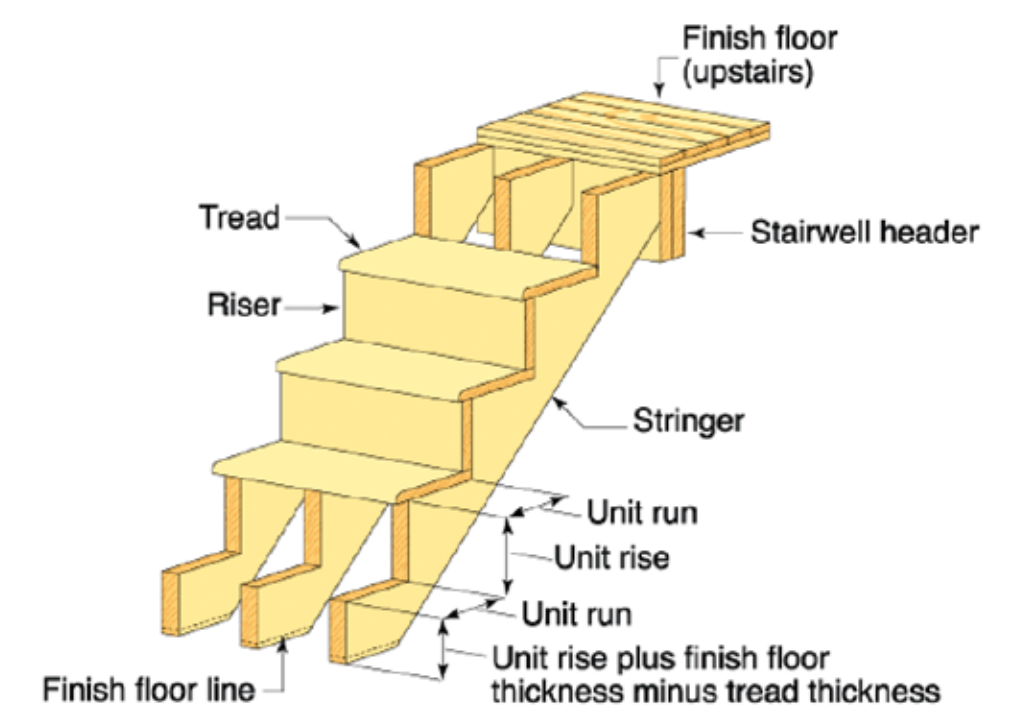
$$\text{Rate of Change} = \frac{10 \text{ m}}{1 \text{ min}}$$

TECHNOLOGICAL STUDIES

$$\text{Pitch} = \frac{\text{height}}{\text{total run}} = \frac{\text{rise}}{\text{unit run}}$$



$$\text{Pitch} = \frac{\text{rise}}{\text{run}}$$

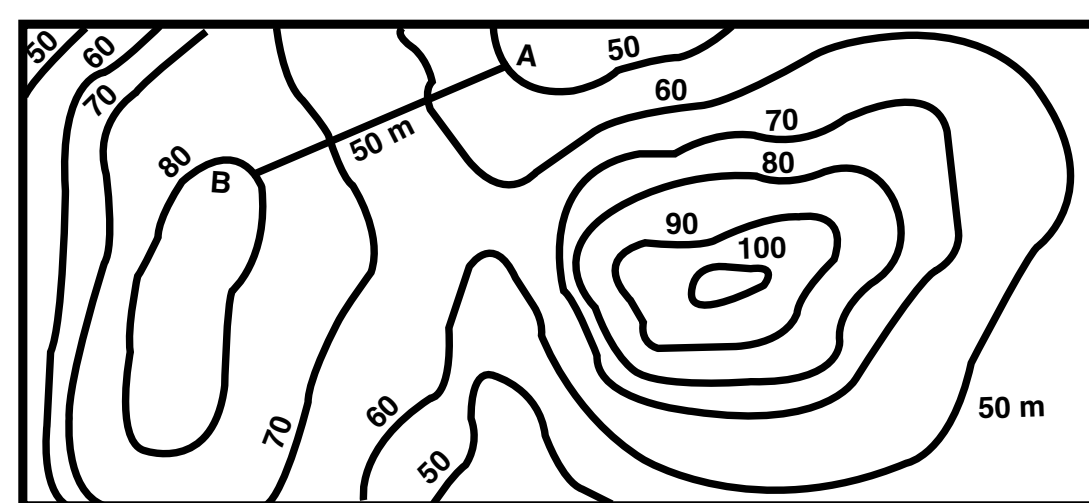


$$\text{stringer length} = \text{total run}^2 + \text{total rise}^2$$

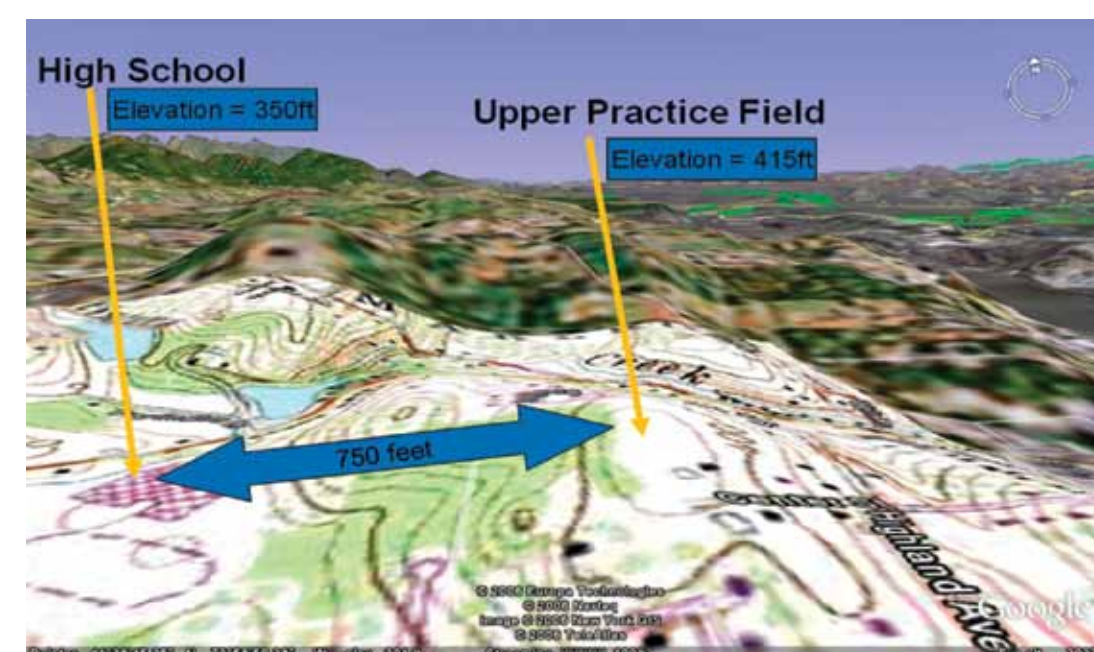
GEOGRAPHY

Map Scale

$$\text{Gradient} = \frac{\text{change in elevation}}{\text{horizontal distance}}$$



$$\text{Gradient AB} = \frac{50 \text{ m}}{30 \text{ m}} \quad \text{Gradient AB} = \frac{3}{5}$$

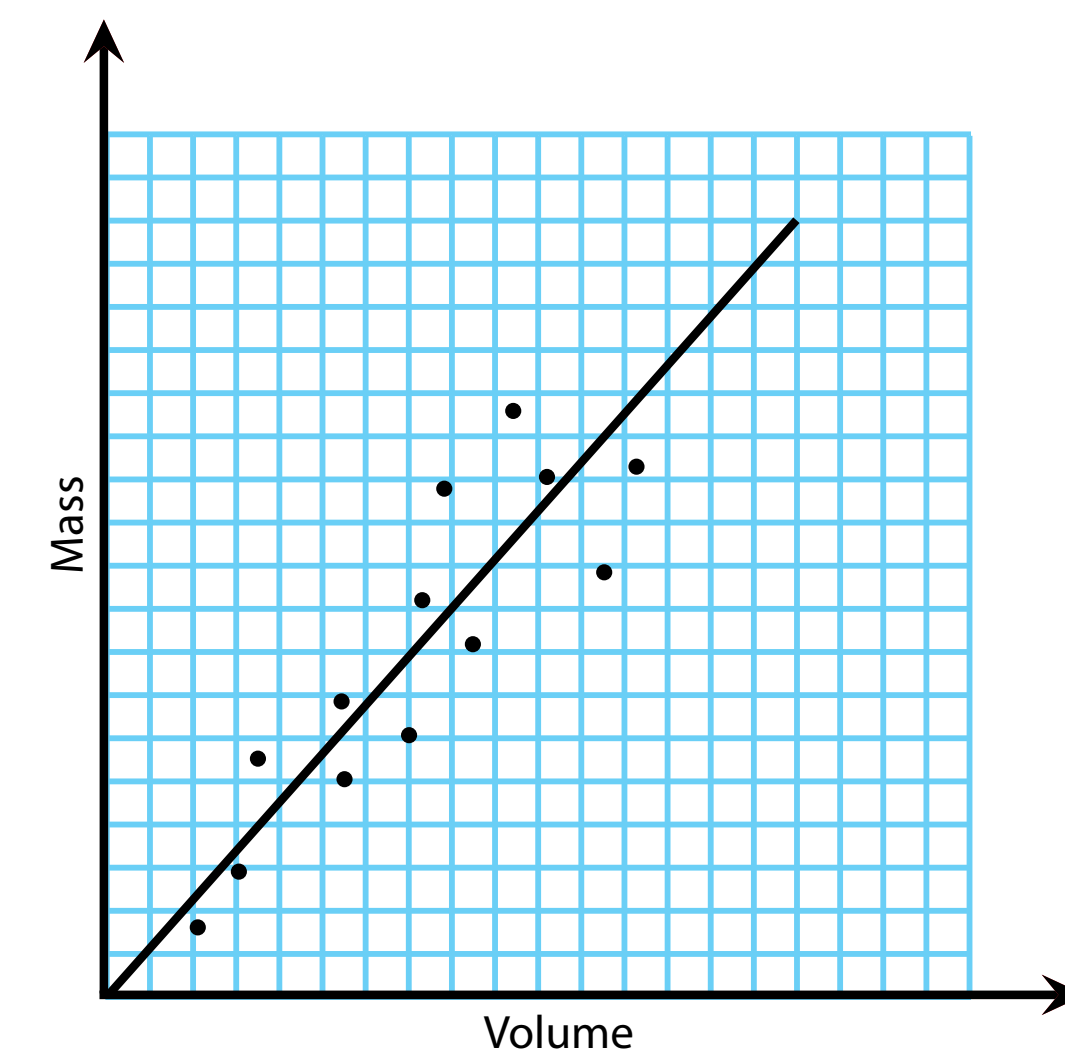


$$\text{Gradient} = \frac{415 \text{ ft} - 350 \text{ ft}}{750 \text{ ft}} = \frac{65 \text{ ft}}{750 \text{ ft}} = 0.087$$

SCIENCE

$$\text{Density} = \frac{\text{mass}}{\text{volume}}$$

$$= \frac{9 \text{ g}}{8 \text{ ml}}$$



Slope

The same algebraic expression or equation can be related to different real-world situations, and different algebraic expressions or equations can describe the same real-world situation. Many equivalent representations can describe the same situation or generalization. Each representation may give a different insight into certain characteristics of the situation or generalization. Limited information about a mathematical relationship sometimes, but not always, allows us to predict other information about that relationship.