

Name: Key  
 Science 7

Date: \_\_\_\_\_  
 Motion

**Aim:** I can accurately read a motion graph and determine when a difference in speed is taking place.

**Do Now:**

1. A vehicle travels 2345 m west in 315 s toward the evening sun. What is its average velocity? (Remember: Speed and Velocity are calculated the same way except velocity has a direction attached. Velocity=distance/time)

Formula	$V = \frac{d}{t}$
Substitution	$V = \frac{2345m}{315s}$
Final Answer with Units	$V = 7.4 \text{ m/s west}$

2. A roller coaster car rapidly losing velocity as it rolls up hill. As it starts up the slope, its velocity is 22 m/s. But 6 seconds later, near the top of the slope, its velocity is 4 m/s. What is its average acceleration?

Formula	$A = \frac{V_F - V_I}{t}$
Substitution	$A = \frac{4m/s - 22m/s}{6s} = \frac{-18m/s}{6s}$
Final Answer with Units	$A = -3.0 \text{ m/s}^2$

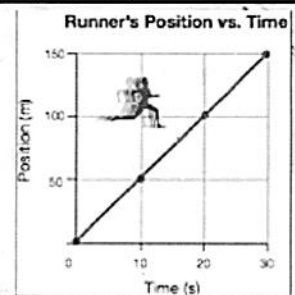
**Notes: Graphing Motion**

Mary is training for a race. Calculate her speed when she is running for 10s, 20 s and 30 s.

Marys' Speed at 10s	Marys' Speed at 20s	Marys' Speed at 30s
$S = \frac{D}{t}$	$S = \frac{D}{t}$	$S = \frac{D}{t}$
$S = \frac{50m}{10s}$	$S = \frac{100m}{20s}$	$S = \frac{150m}{30s}$
$S = 5 \text{ m/s}$	$S = 5 \text{ m/s}$	$S = 5 \text{ m/s}$

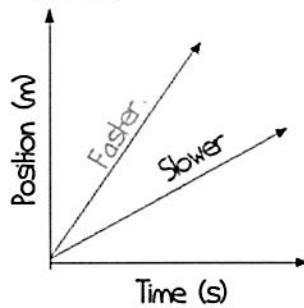
She is traveling at constant speed.

Time (s)	Position (m)
0	0
10	50
20	100
30	150

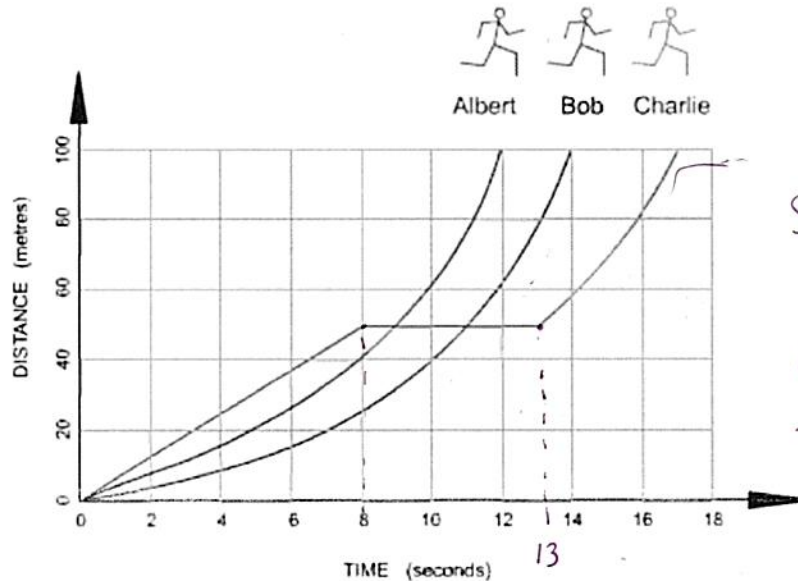


**Slope:**

- The steepness of a graph line; the ratio of the vertical change (the rise) to the horizontal change (the run).
- A bigger slope means a steeper line which means a faster speed.



**Let's Practice:** Albert, Bob and Charlie are running a race. Use the graph below to answer the following questions.



1. Which runner won the race?
2. Which runner stopped for a rest?
3. How long did he stop for?
4. How long did Bob take to complete the race?
5. Calculate Albert's average speed.

Albert

Charlie

5.0 seconds

14.0 seconds

8.3 m/s

$$S = \frac{D}{t} = \frac{100\text{m}}{12\text{s}} = 8.3$$