

$$at = v_f - v_i$$

# Warm-Up

1. How long will it take a car to go from 0m/s to 44 m/s if they are accelerating at 5 m/s<sup>2</sup>?

$$t = ?$$

$$v_i = 0 \text{ m/s}$$

$$v_f = 44 \text{ m/s}$$

$$a = 5 \text{ m/s}^2$$

$$at = v_f - v_i$$

$$(5)t = 44 - 0$$

$$\frac{5t}{5} = \frac{44}{5}$$

$$t = 8.8 \text{ s}$$

2. A freight train traveling with a velocity of 18.0 m/s begins braking as it approaches the train yard. The train's acceleration while braking is -0.33m/s<sup>2</sup>. What is the train's speed after 23 seconds?

$$v_i = 18 \text{ m/s}$$

$$a = -0.33 \text{ m/s}^2$$

$$t = 23$$

$$v_f = ?$$

$$at = v_f - v_i$$

$$(-0.33)(23) = v_f - 18$$

$$-7.59^{+18} = v_f - 18^{+18}$$

$$10.49 \text{ m/s} = v_f$$

3. An automobile manufacturer claims that its latest model can go from 0m/s to 25 m/s in 7.5 seconds. What is the car's acceleration

$$v_i = 0 \text{ m/s}$$

$$v_f = 25 \text{ m/s}$$

$$t = 7.5 \text{ s}$$

$$a = ?$$

$$at = v_f - v_i$$

$$a(7.5) = (25) - (0)$$

$$7.5a = 25$$

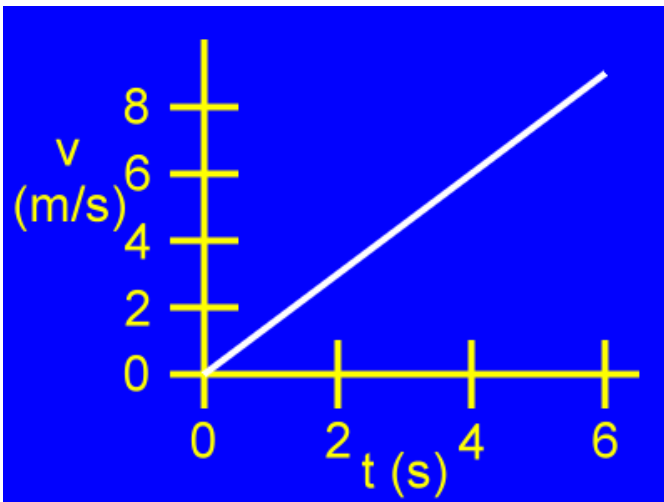
$$a = \frac{25}{7.5} = 3.3 \text{ m/s}^2$$

To Review: We looked at distance time graphs in the last chapter.

What does the line on a distance-time graph represent?  
How would you describe the motion of this object?

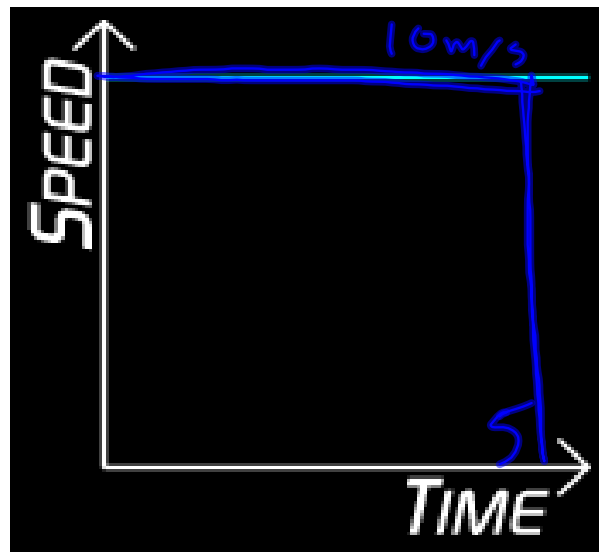
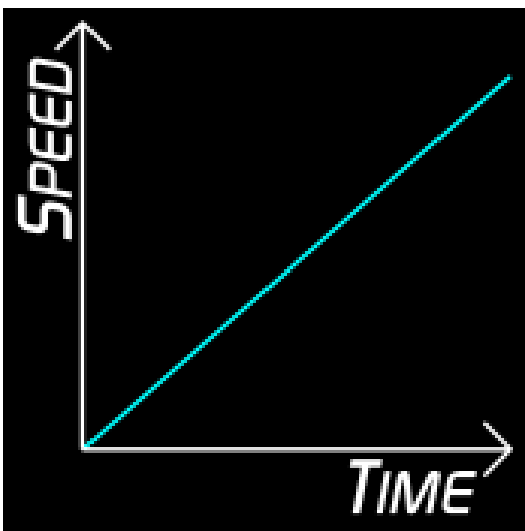


Similar to Distance (d) vs Time (t) graphs, there are Speed (v) vs. Time (t) graphs used to represent the speed of an object. Plotting data on these graphs is very similar to plotting data on a position (d) vs time (t) graph.



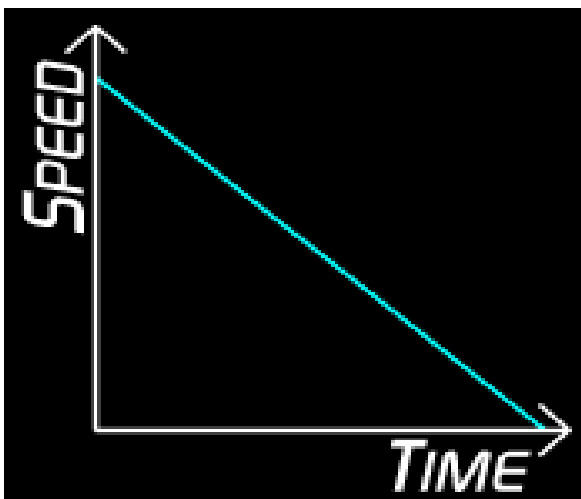
However the line/slope on a (v) vs (t) graph represents **acceleration**

**Describe the motion of the objects:**

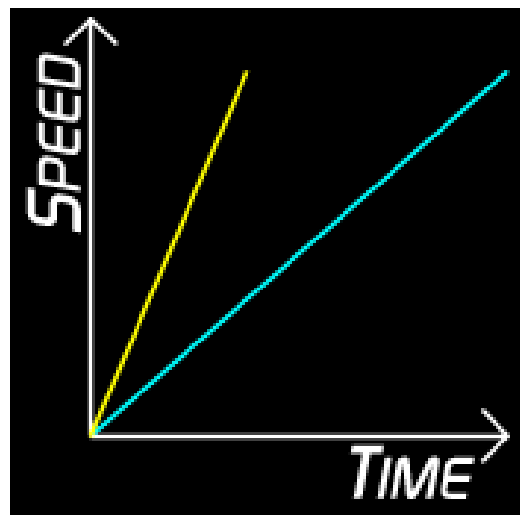


$$d = vt \quad 5 \text{ s}$$
$$= 10 \times 5 = 50 \text{ m}$$

**Describe the motion of the object:**

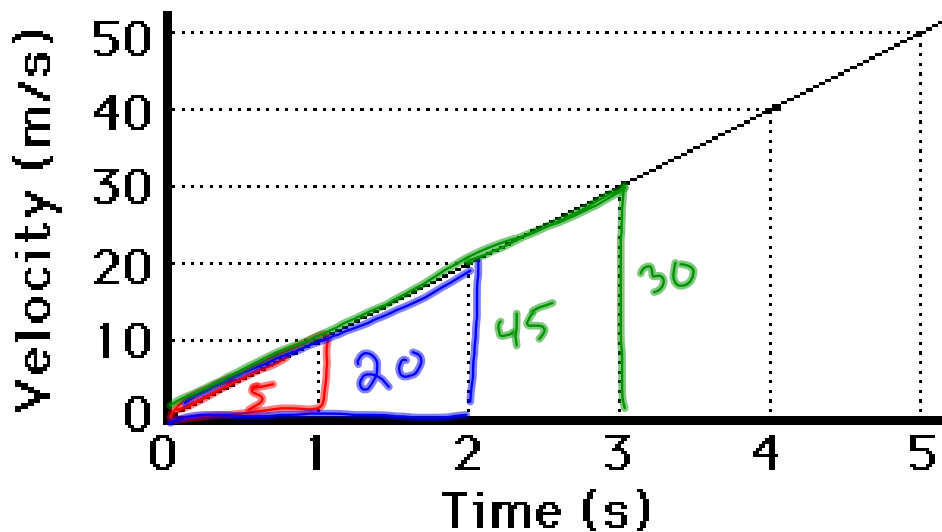
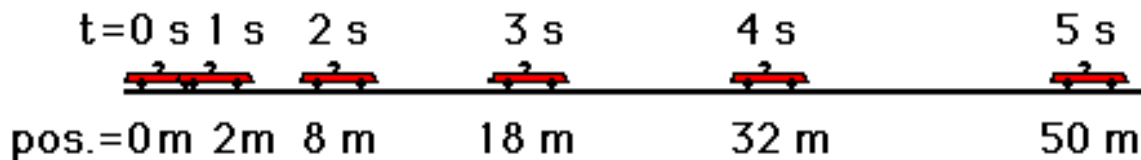


**Which object has the greatest acceleration, the line represented in yellow or blue?**



## Speed - Time Graphs

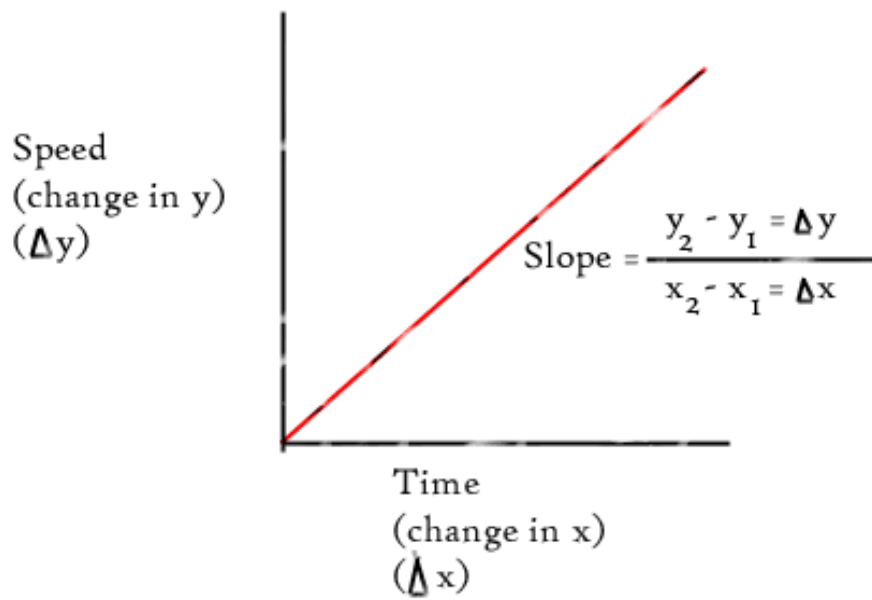
A speed-time graph can give you information about the acceleration of an object. You can find acceleration the same as finding speed from a d vs t graph (find the slope)



$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta v}{\Delta t}$$

(to calculate slope recall from distance-time)

### Speed-Time Graph



p. 393 #1,4a,5ab,6a,11a



## Attachments

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Answers Extra Practice Acceleration WS.notebook

answers acceleration worksheet.notebook