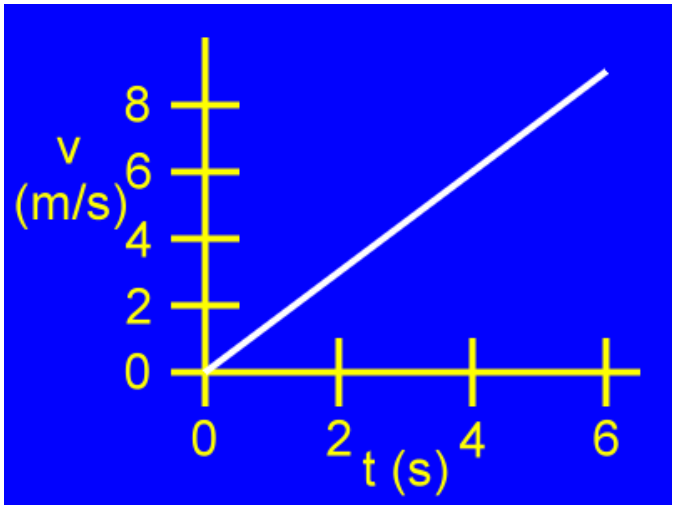
Speed vs. Time Graphs

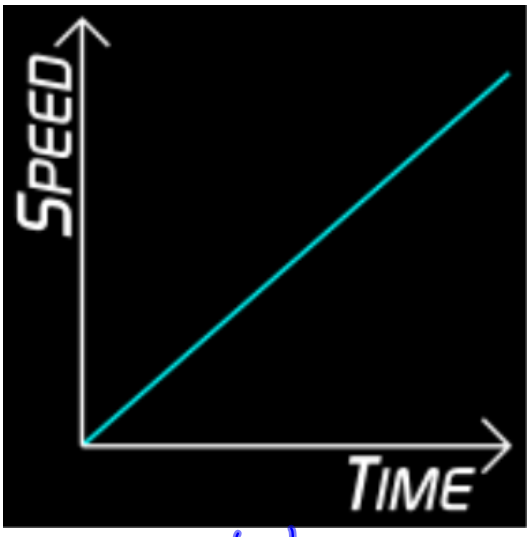
Similar to *distance (d) vs time (t)* graphs, there are *speed (v) vs. time (t)* graphs used to represent the speed of an object. Plotting data on these graphs is very similar to plotting data on a position (d) vs time (t) graph.



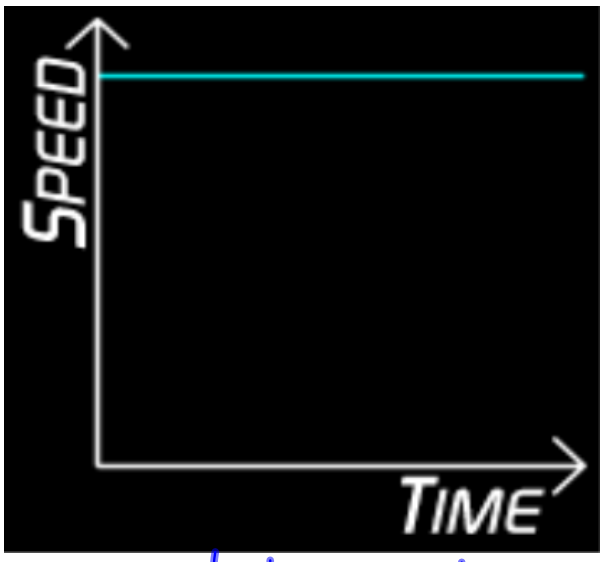
However the line/slope on a (v) vs (t) graph represents **acceleration.**

$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{d}{t}$$

Describe the motion of the objects:

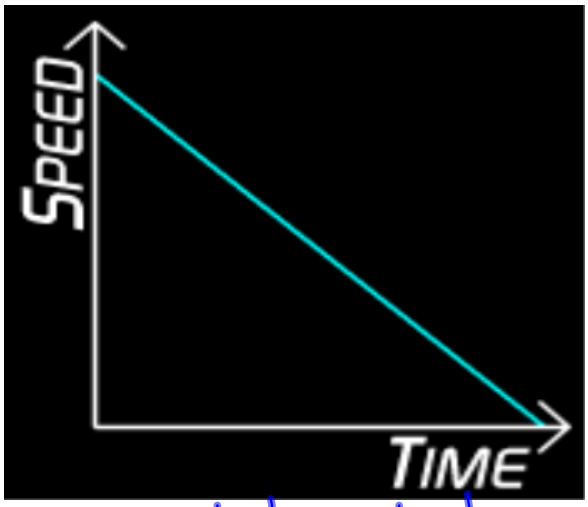


Constant acceleration



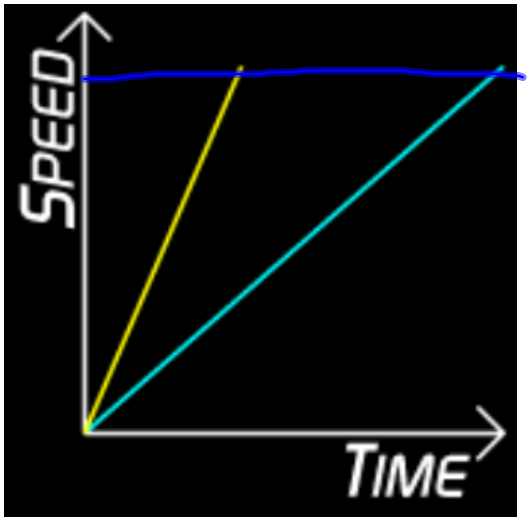
constant speed
0 acceleration

Describe the motion of the object:



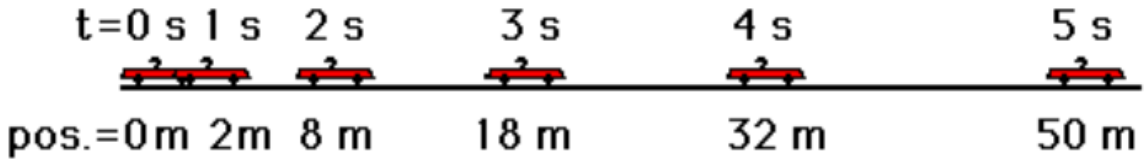
Constant acceleration negative

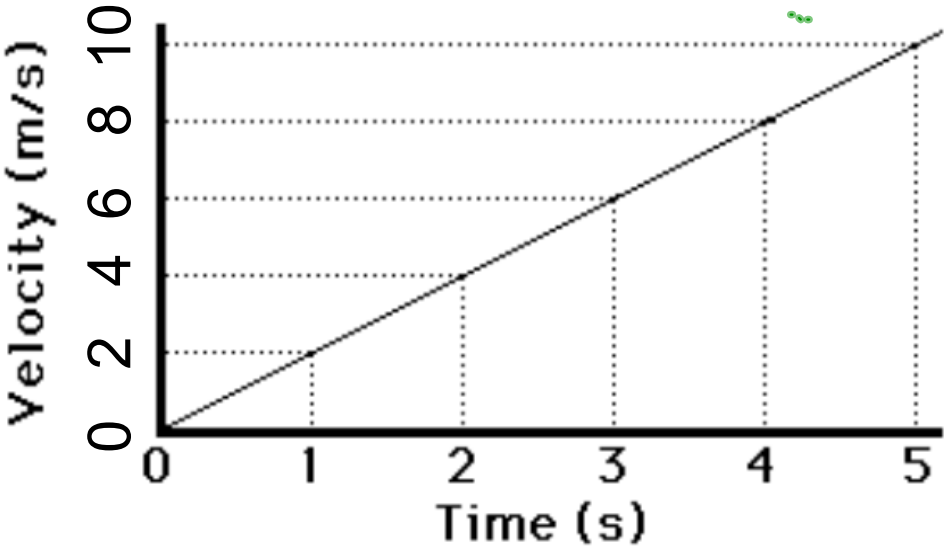
Which object is travelling faster? The line represented in yellow or blue?



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 distance-time graph (find the slope)

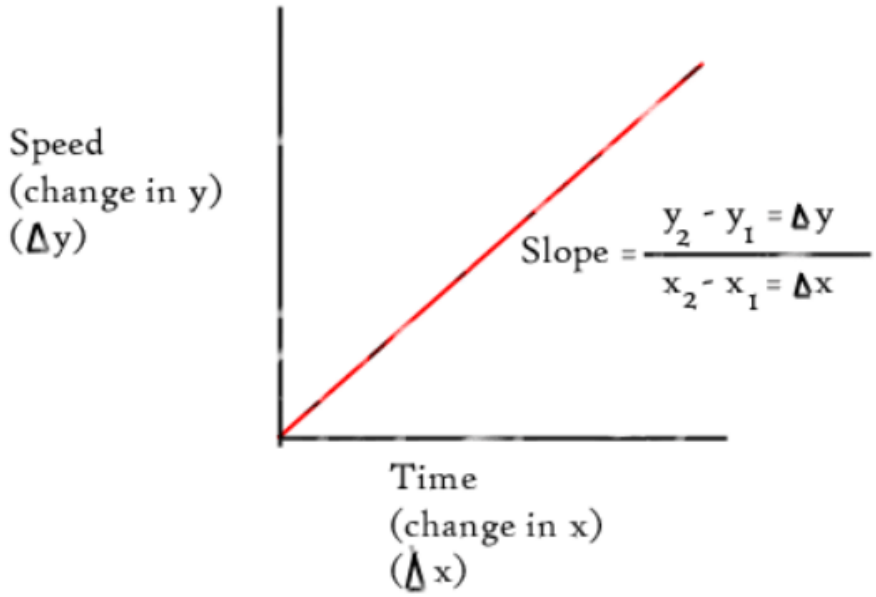




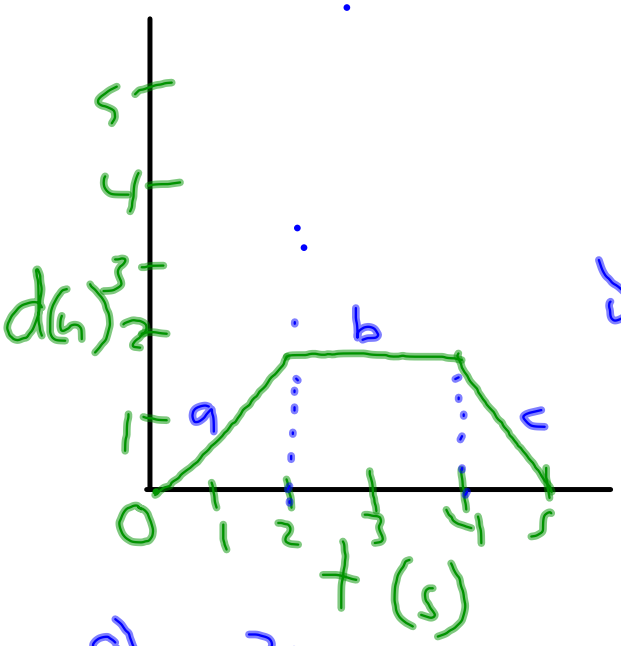
$$\text{slope} = \frac{\text{rise}}{\text{run}} = \frac{\Delta v}{\Delta t} = \frac{10 \text{ m/s}}{5 \text{ s}} = 2 \text{ m/s}^2$$

(to calculate slope recall from distance-time)

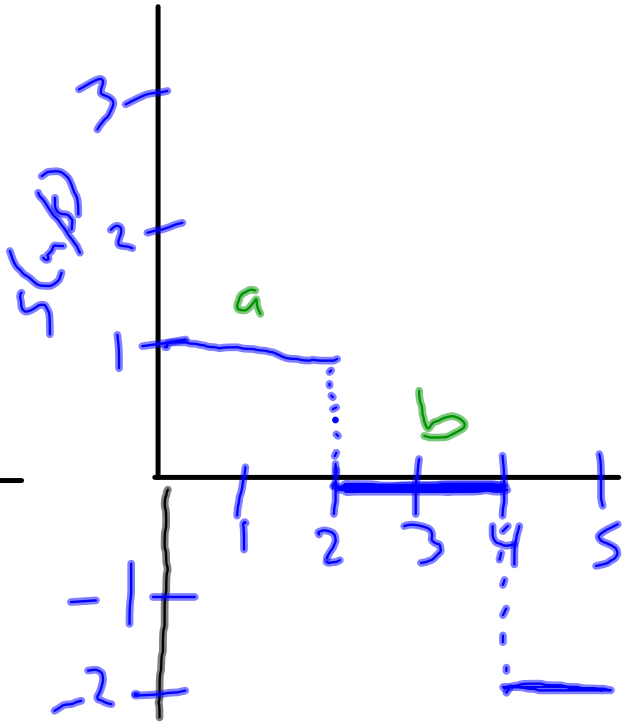
Speed-Time Graph



d-t graph



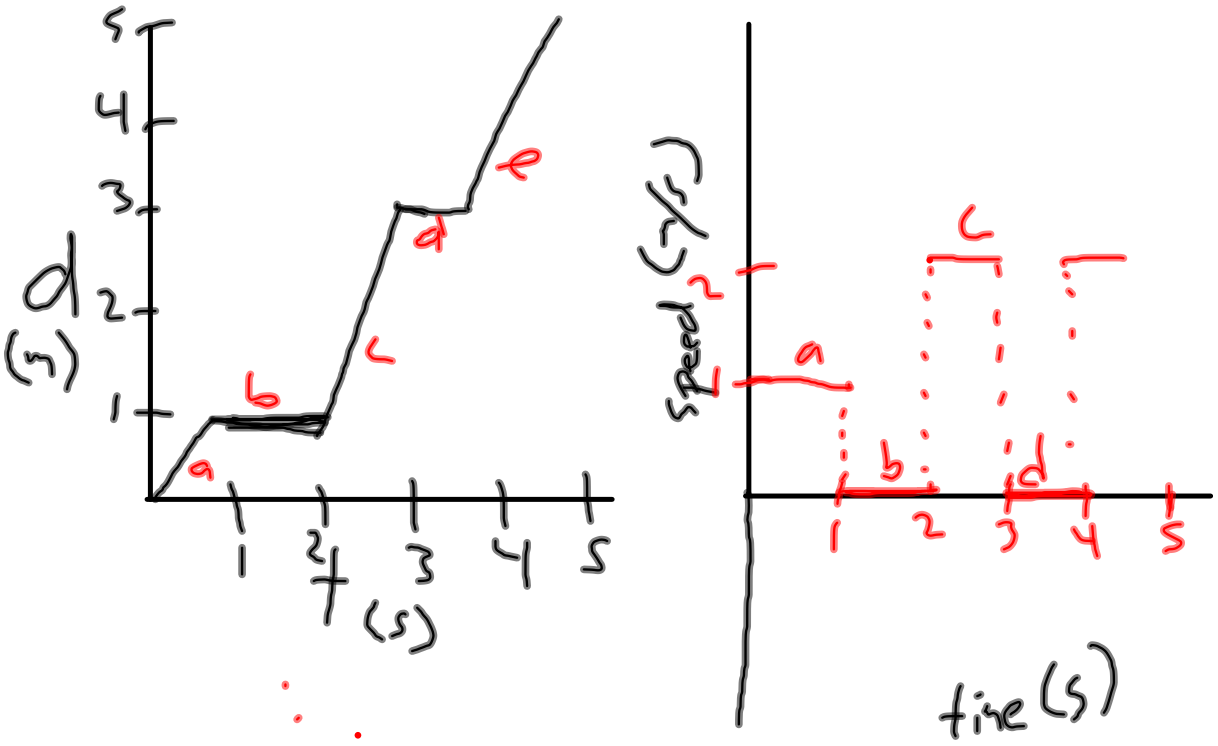
s-t graph



a) $s = \frac{2m}{2s} = 1\,m/s$

b) $s = \frac{0}{2} = 0\,m/s$

c) $s = \frac{-2m}{1s} = -2\,m/s$


d (m)
5
4
3
2
1
a
b
c
d
e
1
2
3
4
5
t (s)
speed (m/s)
2
1
a
b
c
d
1
2
3
4
5
time (s)

Quiz tomorrow on acceleration

$a = \frac{\Delta}{t}$

3 questions

a car accelerates from rest to 35 km/hr in 15 seconds. What is its acceleration?

convert 15 s to h

$$a = \frac{\Delta}{t}$$

$$= \frac{35 \text{ km/h}}{0.0042}$$

$$= 8333 \text{ km/hr}^2$$

Attachments

Answers Extra Practice Acceleration WS.notebook