Speed, Acceleration and Velocity

Distance
_____
Speed x Time
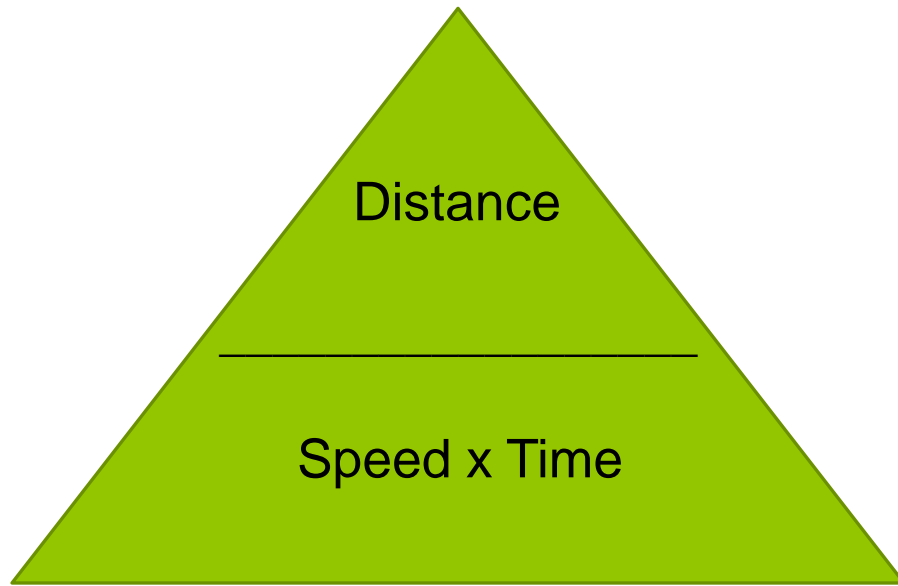
Speed = Distance
              Time

Unit of Speed = m/s

Donkeys'

_____

Smell x Terrible

A sprinter runs 100m in 10 seconds. What is her average speed?

Speed   = Distance
                 Time

Speed   = 100 m
                 10 s

Speed   = 10 m/s

Velocity

- Velocity is just speed and direction

- A car travelled at a speed of 60 m/s North

- It's Velocity is 60 m/s North

Acceleration

- Acceleration = $\dfrac{\text{Change in Speed}}{\text{Time Taken}}$

Units of Acceleration = m/s^2

- Calculate the acceleration of a car if it goes from a speed of 20 m/s^2 to 80 m/s^2 in 3 seconds

- Acceleration = $\underline{\text{Change in Speed}}$
  Time Taken

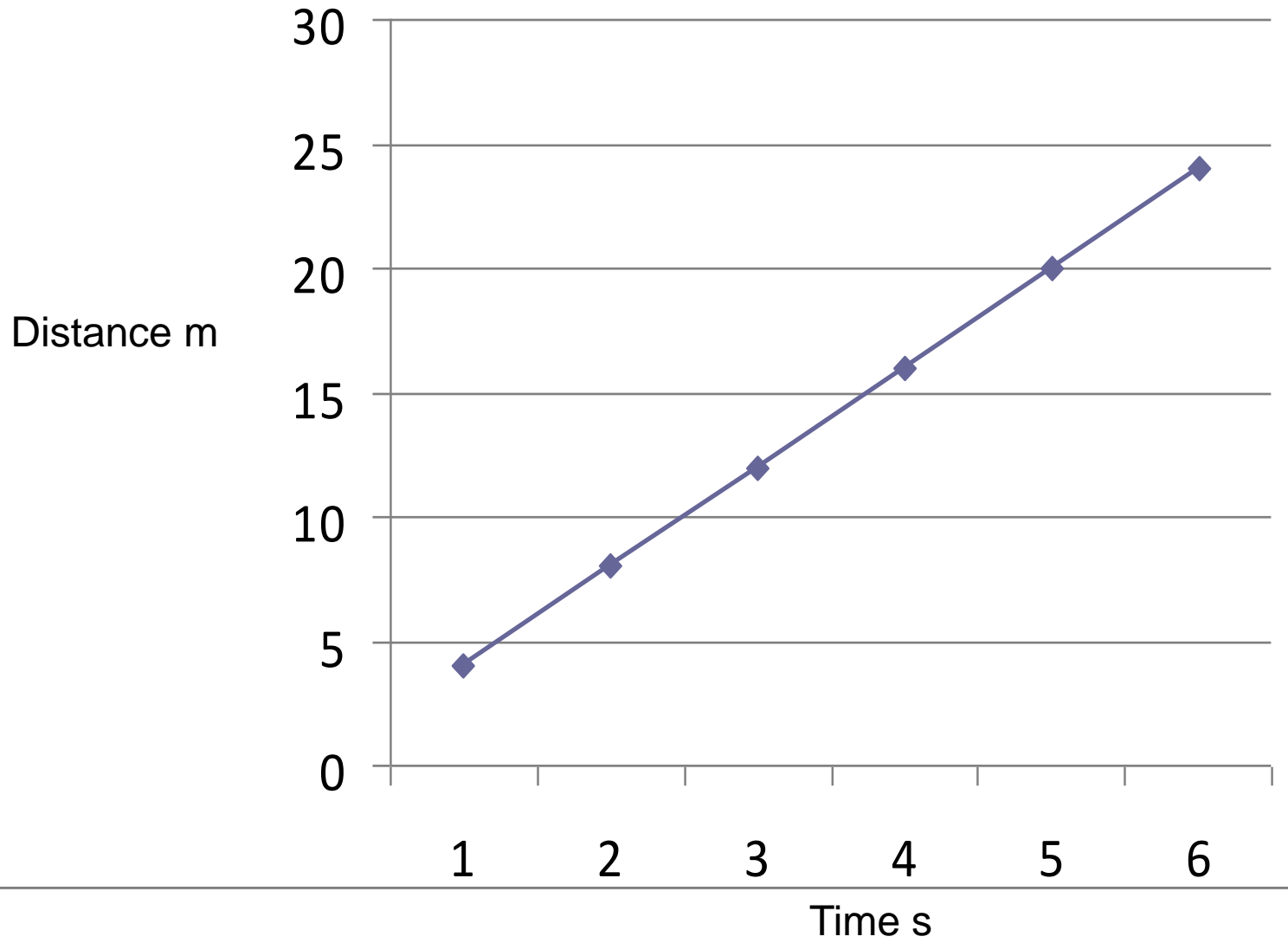- Acceleration = $\underline{\text{60 m/s}}$
  6 s

- Acceleration = 10 m/s^2

Speed/Distance Graphs

Information about a moving object can be given in a table and you can draw a graph of the motion.

Time s	1	2	3	4	5	6
Distance m	4	8	12	16	20	24

Draw a distance/time graph, use the time data as x co-ordinates and the distance data as y co-ordinates on a graph.

- Calculate the speed of the moving object

- Speed   = $\dfrac{\text{Distance}}{\text{Time}}$

- Speed = $\dfrac{20 \text{ m}}{5 \text{ s}}$

- Speed = 4 m/s

- Use your graph to estimate the distance of the moving object at a speed of 3 seconds

- Use your graph to estimate the time it takes an object to move 20 meters

- Is the object accelerating in this graph? Explain your answer

- The object is not accelerating because you have a straight line graph, which indicates the speed is constant.

- Is the distance directly proportional to time? Explain your answer

- Yes distance and time are directly proportional to each other because when one increases the other increases.

- When time increases by 1 second, distance increases by 4 meters

- You also have a straight line graph