KNOWLEDGE ORGANISER
BIG IDEA: FORCES
TOPIC: FORCES AND MOTION

Key Word	Definition
distance	How far an object has travelled, measured in metres (m)
time	How long something takes, measured in seconds (s)
speed	How fast an object is moving
average speed	How far an object has travelled in a certain amount of time
constant speed	Where the speed remains the same and does not change
stationary	Not moving
rate of change	How much something has increased or decreased compared to something else
acceleration	The rate of change of speed with time

Equations

Speed (m/s) **= distance** (m) **/ time** (s)

Acceleration (m/s^2) **= change in velocity** (m/s) **/ time** (s)

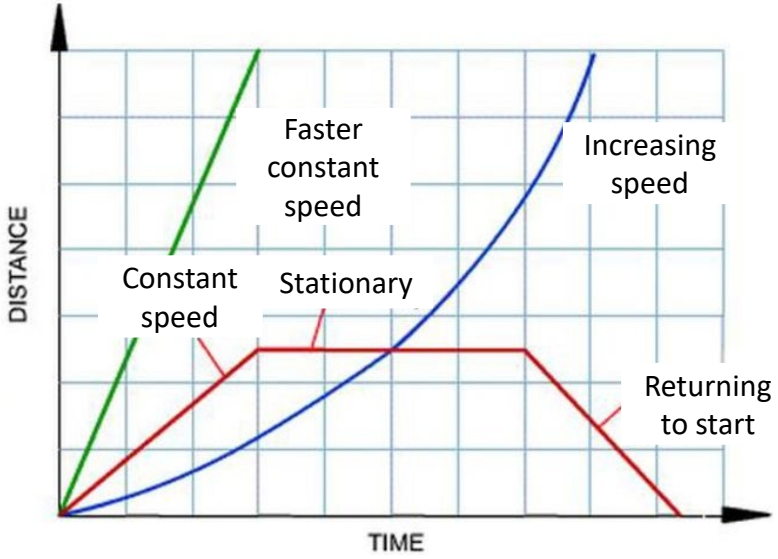
Forces Cause Change

- If there is no resultant force there will be no change in motion
- If there is a resultant force the object will either accelerate or decelerate

Distance-Time Graphs

Journeys can be represented as graphs by plotting the distance travelled by the object against the time taken.

- The shape of the graph gives you information about the objects motion
- The steeper the graph the faster the object is moving
- The shallower the graph the slower the object is moving
- By splitting the graph into different sections you can use the distance travelled and the time taken to calculate the average speed for that section of the journey

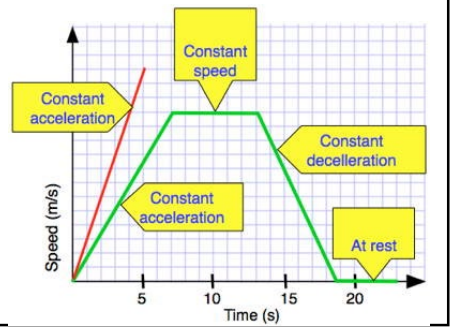


Quantity	Symbol	Unit	Unit Symbol
distance	s	metres	m
time	t	seconds	s
speed	v	metres per second	m/s
acceleration	a	Metres per second per second (metres per second squared)	m/s^2

Speed-Time Graphs

Journeys can also be represented as graphs by plotting the speed of the object against the time taken.

- The shape of the graph may be the same as the distance-time graph but because it has speed on the y-axis it means something different
  - Notice that a horizontal line on a distance-time means stationary whereas on a speed-time graph it means constant speed
- The area of the shape under the line = distance travelled by the object



Knowledge organiser
Big idea:

Y7 topic: Forces and Motion

I have already learned:

In KS2:
Y5 – Objects fall to the Earth due to gravity, identify the effects of friction

This topic links to:
Y7 Forces Intro
Y8 Magnetic Forces
KS4; P1 Energy, P5 forces, P7 Magnets and Electromagnets, P8 Space
KS5; Forces and Motion, Newtonian world and astrophysics, particles and medical physics

It is important to study about forces and motion because…

Motion makes the world go 'round. Motion makes the moon go 'round too. In fact, motion makes lots of things go. When we think of motion we often think of cars, bicycles, kids running, basketballs bouncing and aeroplanes flying. But motion is so much more. Motion is important to our lives and impacts so many things that we do. Motion is the changing of position or location. But motion requires a force to cause that change. Let's learn about force and motion and the effects of these physical laws in our world.

Possible careers involving forces and motion are…

Engineer
Race car driver
Gymnast
Game developer
Architect
Geophysicist
Construction
Pilot
Sports player
Astrophysicist
Nuclear physicist
Physio
Armed forces
Astronaut
Sports coach
…and many more