Forces & Motion
Review

Describe Acceleration

- A change in velocity – which may be:
  - A change in speed
    - Starting
    - Stopping
    - Speeding up
    - Slowing down
  - A change in direction
- Acceleration is caused by unbalanced forces

Describe Acceleration

Deceleration is also called negative acceleration - it means an object is slowing down

When acceleration is calculated, it may be a negative number

Describe Speed

- A way to describe motion

–Average speed - Rate of motion calculated by dividing the distance traveled by the amount of time it takes to travel that distance

–Constant speed - Speed that does not change

–Instantaneous speed - Speed of an object at any given time

What is the formula for calculating speed?

Speed is calculated by dividing distance by time –

Calculate This Speed

A football field is about 100 m long. If it takes a person 20 seconds to run its length, how fast was the football player running?

Speed = Distance ÷ Time

Speed = 100 m ÷ 20 s
Speed = 5m/s

Explain Balanced Forces

- When all the forces acting on an object balance each other
- Balanced forces do not cause a change in motion

Describe Friction

- Force that resists motion between two touching surfaces

- Acts in the opposite direction of the object's motion

Produces heat

Distinguish Between Speed and Velocity

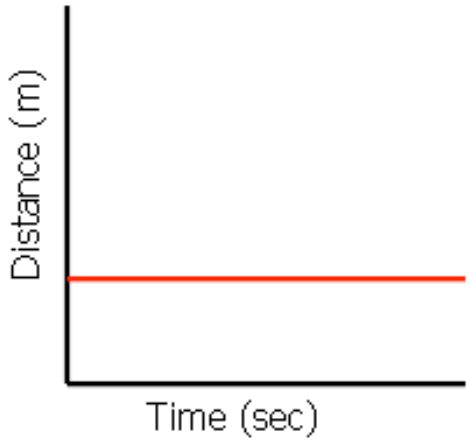
- Speed describes distance and time
- Velocity describes distance, time, and direction

How Can Forces Affect Objects?

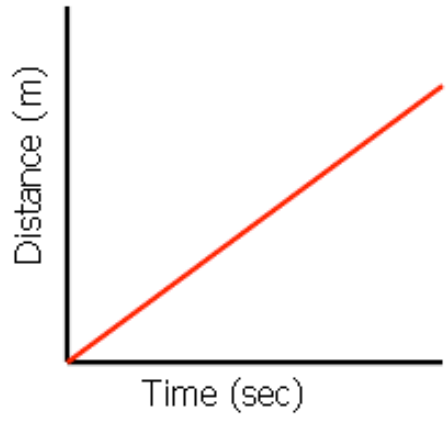
- Slow them down
- Speed them up
- Stop them
- Start them
- Change their direction
- Change their shape

Interpret The Graph Below:

The graph shows an object which is not moving (at rest).
The distance stays the same as time goes by because it is not moving.

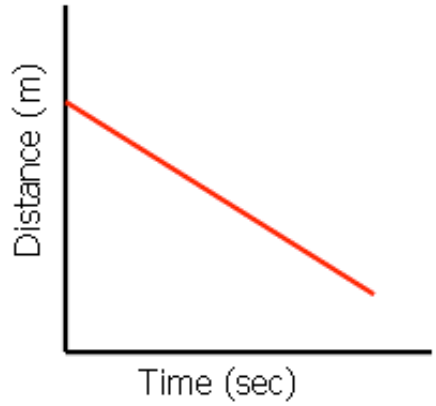


Interpret The Graph Below:



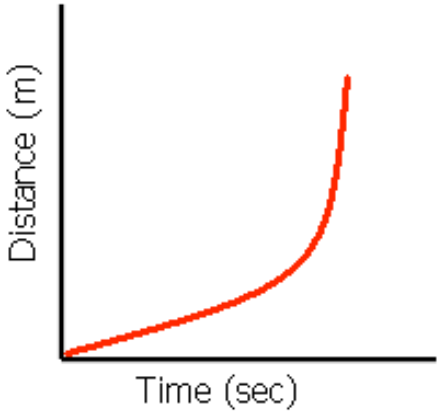
The graph shows
that the objects distance increases as time passes.
The object is moving and so it has velocity.
The straight line shows it is a constant (not changing).

Interpret The Graph Below:



Just like the previous graph, this graph shows an object moving with constant velocity

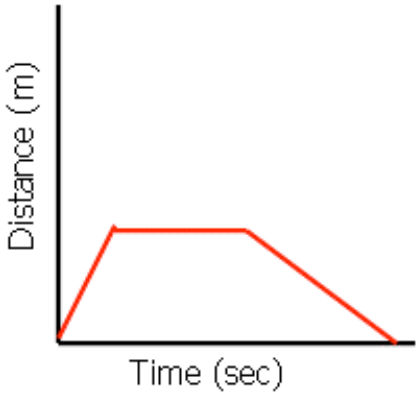
Interpret The Graph Below:



The curve in the graph shows that the objects velocity is changing as time passes.

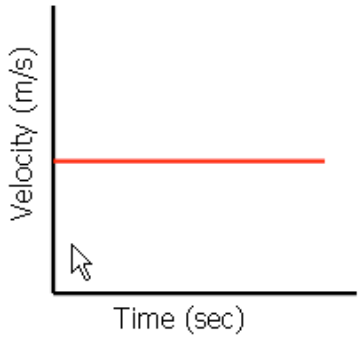
This is acceleration.

Interpret The Graph Below:



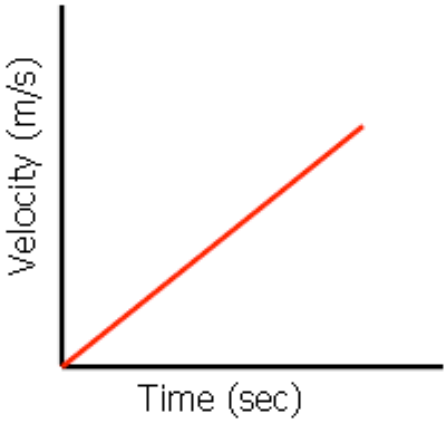
In the first part of the graph the object is moving with constant velocity.
In the second part of the graph the object is at rest (not moving).
In the third part the object is again moving with constant velocity.

Interpret The Graph Below:



es not change as time passes.

Interpret The Graph Below:



The graph shows
that the objects velocity is increasing as time passes – it is accelerating.
The straight line shows that it is constant acceleration.

Explain Inertia
Newton's First Law on Motion describes the idea of inertia

•An object at rest or in constant motion is acted upon by balanced forces – an **unbalanced force** will change the motion

•Acceleration of an object at rest or in constant motion is 0 m/s/s (no motion)
Explain Inertia
•Moving objects tend to continue moving unless acted upon by an unbalanced force

•Objects at rest tend to stay at rest unless acted upon by an unbalanced force

•The more mass an object has, the more inertia it has
–More massive objects are harder to start moving and stop moving
–Smaller objects are easier to start and stop moving
Explain Newton's First Law of Motion
Explain Newton's First Law of Motion
•Describes the idea of inertia

Click the link below to observe the law

http://archive.ncsa.uiuc.edu/Cyberia/VideoTestbed/Projects/NewPhysics/newtons_1.html

When you are finished, click the back button on your browser to return to this tutorial
Explain Newton's Second Law of Motion
Explain Newton's Second Law of Motion
•Describes motion created by unbalanced forces
•Mass and acceleration change in opposite ways

–The more mass an object has, the more force it take to accelerate the object, the slower it accelerates

–The less mass an object has, the less force it take to accelerate the object, the faster it accelerates

Explain Newton's Second Law of Motion

Click on the link below to observe the law:

http://archive.ncsa.uiuc.edu/Cyberia/VideoTestbed/Projects/NewPhysics/newtons_2.html

When you are finished, click the back button on your browser to return to this tutorial

Explain Newton's Third Law of Motion
Explain Newton's Third Law of Motion

- Describes why forces act in pairs

- For every action there is an equal and opposite reaction

- Action and reaction forces are equal forces acting in opposite directions on different objects

Explain Newton's Third Law of Motion