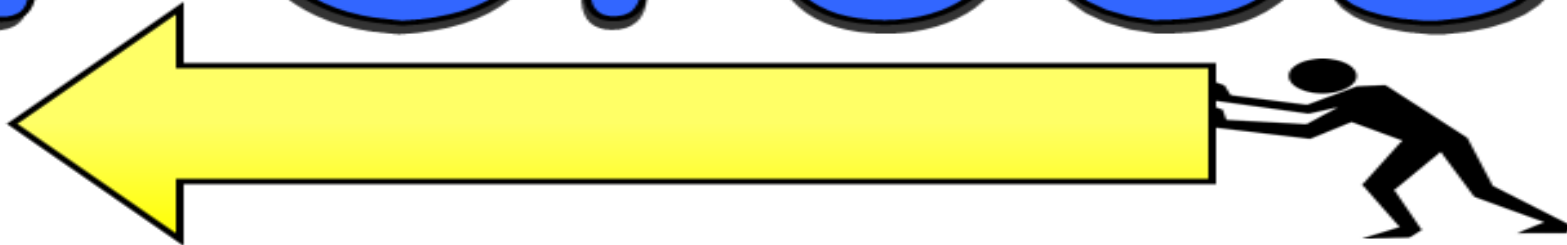


Forces



VOCABULARY

- ▶ Attracted: Pulled towards
- ▶ Distance-time graph: graph that shows how distance travelled changes with time
- ▶ Force of attraction: force which pulls magnets or other objects together.
- ▶ Force of repulsion: force which pushes magnets or other objects apart.
- ▶ Friction: Opposing force.
- ▶ Graph: Diagram showing the relationship between two quantities.
- ▶ Iron filings: very small pieces of iron that look like a powder.
- ▶ Like poles: two north poles or two south poles of two magnets.
- ▶ Magnet: object which can exert a magnetic force on a magnetic material.

VOCABULARY

- ▶ Magnetic force: force exerted by a magnet on magnetic materials.
- ▶ Magnetic materials: materials that are attracted by magnets.
- ▶ Motion: movement.
- ▶ Newton: Unit of force.
- ▶ Non-magnetic materials: materials which are not attracted by magnets.
- ▶ Odometer: device used to measure distance.
- ▶ Repel: push away from itself.
- ▶ Speed: distance travelled by an object in a given time.
- ▶ Speedometer: device used to measure speed.
- ▶ Spring balance: device used to measure force.
- ▶ Unlike poles: north pole of one magnet and south pole of another magnet.



- ▶ The boys are playing football. What happens to the ball when a boy kicks it?
- ▶ How can the ball be stopped?





- ▶ The boys are playing football. What happens to the ball when a boy kicks it?

Answer: the ball moves.

- ▶ How can the ball be stopped?

Answer: A force can be applied to the ball



Forces and moving objects

- ▶ A force is needed to make an object move. Let us study the effect of a force on the movement of an object using the example of a toy car.
- ▶ A toy car placed on a table does not move unless a force is applied on it. When the toy car is not moving, we say it is the rest.

1



When the toy car is given a push, it moves a short distance

2



The car then comes to rest. This is because an opposing force called friction acts on the toy car.

3



If the surface is very smooth, there will be no opposing force acting on the moving toy car. The toy car will continue to move at the same speed in a straight line.

Thus, an object remains at rest or continues to move at the same speed in a straight line unless a force acts on it.

Movement depends on the mass of an object.

- ▶ The mass of an object affects how easy or difficult it is to move the object. For example, it is more difficult to move a heavy lorry than to move a car. We have to apply more force to move heavier objects than to move lighter objects.



The man has to use more force to move the lorry than to move the car.

Movement depends on the shape of an object

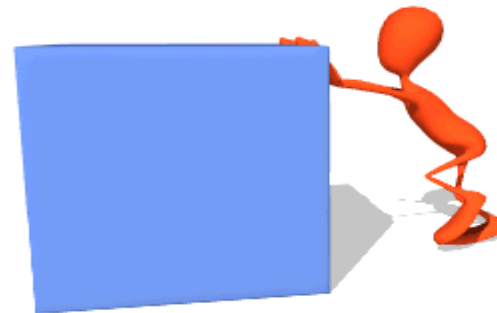
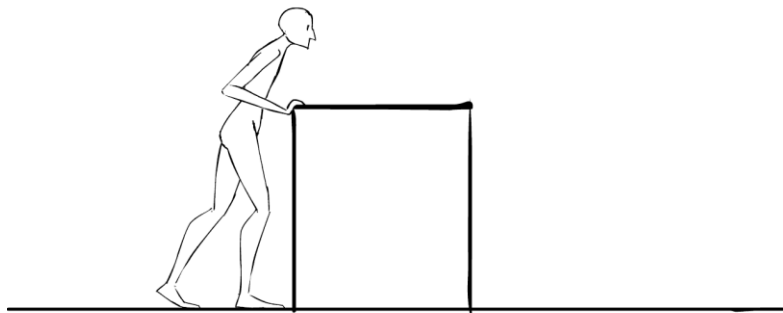
- ▶ The shape of an object also affects how easy or difficult it is to move the object. For example it is more difficult to push a box along the floor than to push a ball of the same size and mass. We have to apply more force to move the box than to move the ball.



The boy has to use more force to push the box than to push the ball.

Movement depends on the strength of the force applied

- ▶ The strength of the force applied on an object also affects the movement of the object. When a box is given a push with a greater force, it moves faster and covers a longer distance. When the same box is given a push with less force, it moves slower and covers a shorter distance.



MEASURING THE MOTION OF AN OBJECT

- ▶ Measuring distance: it is important to know how to measure distance so that we can see how much an object has moved. Short distances are measured in centimetres, while longer distances are measured in metres or kilometres.

MEASURING DISTANCE

Rulers



We can measure very short distances using a ruler.

Measuring tape



We can measure longer distances using a measuring tape.

Odometer



We can measure very long distances using devices like the odometer, which is commonly used in cars.

Activity 16.1

