

# Sithney C.P. School Knowledge Organisers



## Science. Physics: Forces

### What you should already know:

A force is a push or a pull.

When an object moves on a surface, the texture of the surface and the object affect how it moves. It may help the object to move better or it may hinder its movement e.g. ice skater compared to walking on ice in normal shoes.

A magnet attracts magnetic material. Iron and nickel and other materials containing these, e.g. stainless steel, are magnetic. The strongest parts of a magnet are the poles. Magnets have two poles – a north pole and a south pole. If two like poles, e.g. two north poles, are brought together they will push away from each other – repel. If two unlike poles, e.g. a north and south, are brought together they will pull together – attract.

For some forces to act, there must be contact e.g. a hand opening a door, the wind pushing the trees. Some forces can act at a distance e.g. magnetism. The magnet does not need to touch the object that it attracts.

### Key learning:

- A force causes an object to start moving, stop moving, speed up, slow down or change direction.
- Gravity is a force that acts at a distance. Everything is pulled to the Earth by gravity. This causes unsupported objects to fall.
- Air resistance, water resistance and friction are contact forces that act between moving surfaces. The object may be moving through the air or water, or the air and water may be moving over a stationary object.
- A mechanism is a device that allows a small force to be increased to a larger force. The pay back is that it requires a greater movement. The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. Pulleys, levers and gears are all mechanisms, also known as simple machines.

### Key Vocabulary:

**Air Resistance:** is a type of friction between air and another material. It slows things down in the air.

**Force:** A push or a pull causing an object to start moving, stop moving, speed up, slow down or change direction.

**Friction:** a force between two surfaces that are sliding, or trying to slide, across each other.

**Gears:** are wheels with toothed edges that rotate on an axle or shaft. The teeth of one gear fit into the teeth of another gear. This lets one gear turn the other, meaning one axle or shaft can be used to turn another shaft.

**Gravity:** a force that holds things to the Earth's surface and stops things from floating up and into the atmosphere around and above us.

**Lever:** is a rigid object used to make it easier to move a large load a short distance or a small load a large distance.

**Mechanism:** A part, often consisting of a set of smaller parts, which performs a function.

**Pulley:** is simply a collection of one or more wheels over which you loop a rope to make it easier to lift things.

**Upthrust:** the upward force that a gas or liquid has on an object floating in it.

**Water resistance:** is a type of force that uses friction to slow things down that are moving through water. It is often called drag.

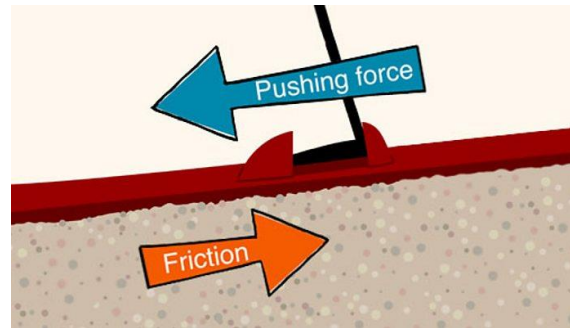
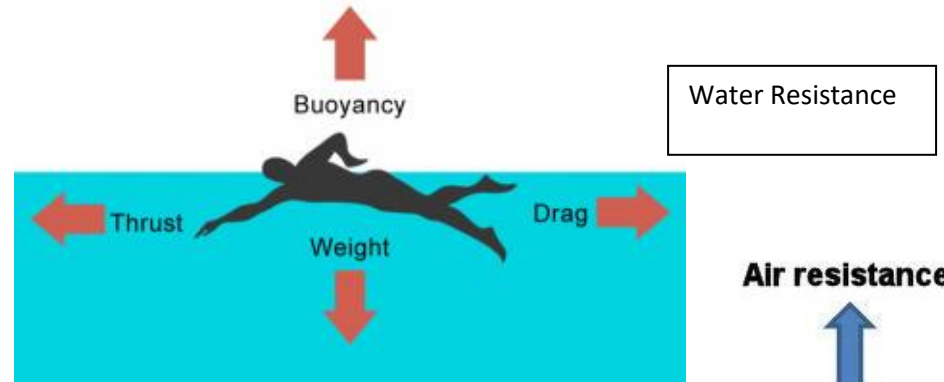
**Key Facts:**

Forces can make an object start to move, stop moving, change direction, move faster, change its shape or move slower.

Forces are measured in Newtons.

**Galileo Galilei** (1564-1642)- discovered that if two objects of similar size and shape are dropped, they will fall at the same rate.

**Sir Isaac Newton** (1642-1726)- an English mathematician and scientist. He discovered the concept of gravity when sitting under a tree and an apple fell to the ground near him.



**Gears, Pulleys and Levers**

