Year 5 Science Knowledge Organiser: Forces

Subject Specific Skills

- Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

Prior Learning

- Compare how things move on different surfaces.
- Notice that some forces need contact between two objects, but magnetic forces can act at a distance.
- Observe how magnets attract or repel each other and attract some materials and not others.
- Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.
- Describe magnets as having two poles.
- Predict whether two magnets will attract or repel each other, depending on which poles are facing.

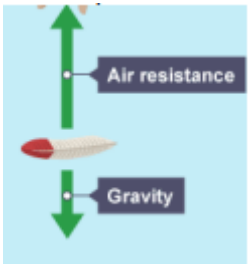
Key Knowledge:

FORCES

Gravity – the force that pulls things to the ground. Gravity also holds Earth and other planets in their orbits around the sun.

Friction – friction is a force between 2 surfaces that are sliding or trying to slide across each other. Friction works in the opposite direction to which the object is moving. It slows down the moving object and also produces heat. It can be helpful in certain situations but not helpful in others.

Air resistance – a type of friction between air and another material. Aeroplanes and cars are streamlined so that they can move through the air as easily as possible.



Water resistance – a type of friction between water and another material. When you go swimming there is friction between your skin and the water particles.

Key Vocabulary

Force – a push, pull, twist or turn.
Gravity – a pushing force exerted by the Earth, it attracts objects towards the centre of the Earth.
Air resistance – the force that air exerts on a moving object.
Water resistance – the force that water exerts on a moving object. **Friction** – the force between 2 moving surfaces.
Mechanisms – machines or devices which help to achieve a result.
Weight – the measure of the force of gravity on an object, measured in Newtons (N)
Mass – the measure of how much matter is inside an object, can be measured in g/kg etc.
Streamlined – when an object is shaped to minimise the effects of air or water resistance.

Key Individual:

Sir Isaac Newton

Is considered by some as one of the most important scientists in history. One of his achievements was developing the theory of gravity. It is thought he developed the theory when he saw an apple fall from a tree.

Key Knowledge:

TYPES OF MECHANISMS

Pulleys – they are used to reduce the amount of force needed to lift a load. The more wheels in a pulley the less force is needed to lift the weight.
Gears or cogs – are used to change speed, direction or force of a motion. When 2 gears are connected they always turn in the opposite direction to one another.
Levers – can be sued to make a small force lift a lighter load. A lever always rests on a pivot or fulcrum.

FORCE METER – is marked in Newtons and measures the weight of ar object.