

All children – regardless of gender, starting point or background – will have the opportunity to engage with a high-quality science education. They will be equipped with the knowledge, skills and vocabulary to understand how science can be used to explain what is occurring, predict how things will behave and analyse caused. We intend to inspire a sense of enjoyment and curiosity about science.

Forces— Air & Water Resistance, Friction and Gravity.

Autumn 1

Igniting Prior Knowledge:

Year 3 (*Forces and Magnets*)

- A force is a push or a pull.
- A force can cause an object to accelerate, slow down, remain in place or change shape.
- 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.
- 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.

Key Vocabulary:

- Gravity
- Earth
- Air resistance
- Water resistance
- Friction
- Mechanisms
- Simple machines
- Levers
- Pulleys
- Gears

New Knowledge:

- 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.
- The effects of air/water resistance increases with larger surface areas.
- Streamlining reduces the effects of air/water resistance.
- A mechanism is a device that allows a small force to be increased to a larger force. This small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar, seesaw or bottle top remover.
- Pulleys, levers and gears are all mechanisms, also known as simple machines.
- Levers are rigid bars resting on a pivot that is used to move a heavy or firmly fixed load.
- Gears are toothed wheels that work with others to change the speed or direction of transmitted motion.
- A pulley is a wheel with a grooved rim around that changes the direction of a force applied to the cord attached.

