

Scientific Enquiry

researching



Researching means using secondary sources to find information. We will **research** the work of Galileo Galilei and Isaac Newton.

comparative & fair testing

Comparative testing means testing objects to rank them. **Fair tests** are enquiries that observe or measure the impact of changing one variable when all others are kept the same. We will investigate and explain: the effect of friction in a range of contexts such as trainers and bathmats; the effects of air resistance in a range of contexts such as parachutes, spinners and sails on boats; the effects of water resistance such as by dropping shapes through water and pulling shapes along the surface of water.

Working Scientifically

Asking scientific questions

Presenting results

Planning an enquiry

Interpreting results

Observing closely

Concluding (drawing conclusions)

Taking measurements

Predicting

Gathering and recording results

Evaluating an enquiry results

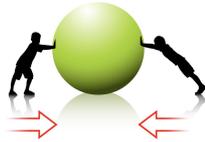
Things you learnt in previous topics

In Year 3 you compared how things moved on different surfaces. You noticed that some forces need contact between two objects. You compared and grouped together everyday materials on the basis of whether they are attracted to a magnet, and identified some magnetic materials. You described magnets as having two poles and predicted whether two magnets will attract or repel each other, depending on which poles are facing.

Subject Specific Vocabulary

force

A **force** causes an object to start moving, stop moving, speed up, slow down or change direction.



Some **forces** are contact forces such as air resistance, water resistance and friction. Some **forces** are non contact forces such as magnetism.

gravity

Gravity is a force that acts at a distance. Everything is pulled to the Earth by **gravity**. It is acting on us all the time, otherwise we would float away. **Gravity** causes unsupported objects to fall towards Earth.



There are different levels of **gravity** on the Moon and other planets.

The scientists Galileo Galilei and Sir Isaac Newton helped to develop the theory of **gravitation**.

air and water resistance

Air and water resistance are contact forces that act between moving surfaces. The object may be moving through the air/water or the air/water may be moving over a stationary object.

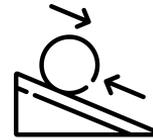
An object travelling through the air will feel the effects of **air resistance**.



An object travelling through water will feel the effects of **water resistance**.

friction

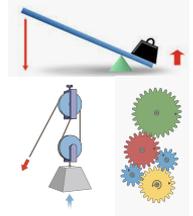
Friction is a contact force. It is the resistance that one surface or object encounters when moving over another.



Different surfaces will exert a different amount of **friction** on an object. A smooth surface, such as a table will exert less **friction** than a rough surface, such as a carpet.

mechanisms

A **mechanism** is a device that allows a small force to be increased to a larger force. The payback 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** or simple machines.

How this connects with future learning

In KS3, you will describe forces as pushes or pulls. You will use arrows in diagrams and explain moment as the turning effect of a force. You will associate forces with deforming objects; stretching and squashing; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. You will measure forces in Newtons and know measurements of stretch or compression as force is changed.

