

**Sir Isaac Newton:** an English physicist who developed the theory of gravity.

Year 5, Summer 2.  
How do forces both help and hinder in our world?

**Galileo:** an Italian scientist who proved that objects of different weights dropped from the same height land at the same time (provided they are same shape & size).

### Key Vocabulary

Air resistance	The friction force acting on objects moving through air.
friction	The force created when two or more surfaces interact (move over each other).
gears	Mechanism used to change speed, direction of force of a movement.
gravity	The force that pulls objects towards the centre of the Earth
lever	Mechanism that rests on a pivot or fulcrum, allowing a smaller force to move a larger load.
mass	The measure of how much matter is inside an object (g/kg)
mechanism	Machines or devices which help to achieve a result.
pulley	Mechanism based on wheels used to reduce the amount of force needed to lift a load
streamlined	The shape of an object that minimises air or water resistance.
Water resistance	The friction force on objects floating or moving in water.
weight	The measure of the force of gravity on the mass of an object.

### Key Knowledge:

Lots of different forces can act on objects, causing them to speed up, slow down or change direction.

If all forces acting on an object are equal (balanced), then the object will be stationary (not move).

Gravity is a force that pulls objects towards each other, e.g. people are pulled towards the centre of the Earth.

It is also the force that keeps the Earth orbiting the Sun.

The force of gravity is six times greater on Earth than on the moon.

Friction is the force created when two surfaces interact.

The rougher the surface, the greater the friction force.

Friction is helpful in certain situations but not in others.

Air resistance and water resistance are examples of friction forces that slow movement.

Different mechanisms, including levers, pulleys & cogs, have been invented to manage the forces involved in different tasks.

### Working Scientifically



What factors influence the diameter and depth of craters made by objects falling on the moon?



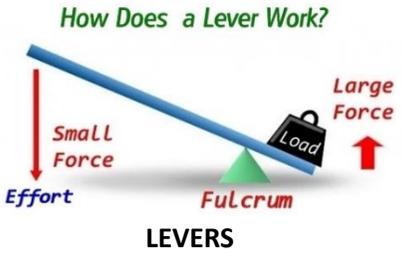
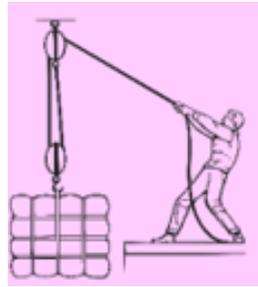
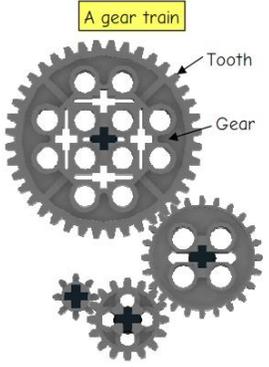
Which surfaces cause the most friction?



How does the area of a parachute affect the speed at which it falls to Earth/ how does the shape of a mass slow its sinking in water?



How do gears affect the speed and direction of movement  
How does using a pulley reduce the force needed to lift a load?

 <p><b>LEVERS</b></p>	<p>A lever is a mechanism to lift heavy weights using the least amount of effort.</p> <p>The larger the lever, the easier it is to lift the load. The fulcrum is where the lever pivots to lift the load.</p>	<p>USES:</p> <ul style="list-style-type: none"> <li>Seesaw</li> <li>Scissors</li> <li>Pliers</li> <li>Crowbar</li> </ul>
 <p><b>PULLEYS</b></p>	<p>These are used like levers to lift loads with less effort but over longer distances.</p> <p>A rope is passed through a pulley which is anchored to a point and then returned to the ground where it is attached to the object to be lifted.</p>	<p>USES:</p> <ul style="list-style-type: none"> <li>Flagpoles</li> <li>Blinds/ Theatre curtains</li> <li>Lifts</li> <li>Construction equipment</li> </ul>
 <p><b>GEARS</b></p>	<p>A gear is a wheel with raised parts called teeth.</p> <p>Gears are designed to work together so that by turning one gear, another gear can be made to rotate.</p> <p>The driver gear provides the power and the gear being turned by it is called the driven gear.</p> <p>Gears let us control how quickly and in what direction something rotates.</p>	<p>USES:</p> <ul style="list-style-type: none"> <li>Cars</li> <li>Windmills</li> <li>Watches</li> <li>Bicycles</li> <li>Pencil sharpeners.</li> </ul>

