

# How does an understanding of forces explain the real world?

## What I already know:

Movement of objects on a surface.  
Pushes and pulls  
Magnetism (attract and repel, poles)  
Some aspects of gravity (from Space topic)

## New knowledge:

Unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.  
Isaac Newton formulated the theory of gravity.  
Force is measured in Newtons.

Friction is a force that occurs between sliding objects.  
Friction can increase or decrease depending on the surface or the material.

Rough surfaces create more friction.  
Smooth surfaces create less friction.  
Friction create heat energy.

Air resistance is a type of friction. Items fall at different speeds because of the way friction acts between them and the air. Designers use this concept to build aerodynamic shaped products. More air resistance means the object will slow down or be harder to move.

Water resistance is also a force between an object and the water it is moving in. The shape of objects can make them buoyant (they will float). The more water resistance, the more the object will be slowed. It also makes it harder to move.

Mechanisms including levers and pulley mechanisms allow a smaller force to have a greater impact. (make it easier to move/lift)

## Enquiry questions:

What are forces?  
What is gravity ?  
What is friction and how does it affect sliding objects?  
How does air resistance slow objects down?  
What is the effect of water resistance.  
What do gears and pulleys do?

## Scientific skills:

Plan enquiries, control variables where necessary.  
Take measurements with increasing accuracy and precision  
Record data and results  
Use scientific diagrams and labels, tables, bar and line graphs, and models  
Report findings  
Present findings  
Use test results to make predictions to set up further tests.  
Identify/discuss the scientific evidence that we have for the ideas/concepts in this topic  
Use research to find out facts about the topic.  
Ask questions of our own.

## Vocabulary

gravity	the force by which a planet or other body draws objects toward its centre.
friction	a force between two surfaces that are sliding, or trying to slide, across each other.
Air resistance	is a type of friction between air and another material. (drag)
Water resistance	A force that uses friction to slow things down that are moving through water.
mechanism	A device/machine that can change the input forces and motion into a desired output force and motion (eg a gear, pulley, lever)
lever	A long support resting on a fulcrum that makes lifting force easier.
fulcrum	The point where a lever rests
pulley	A simple machine for lifting
gear	A cogged wheel used to change speed ratio
Newton	The unit of measure for force.
opposing	Acting in opposite directions.
force	A force is an action that changes or maintains the motion of a body or object
Aerodynamic	The shape of an object affects the friction created when moving. The more aerodynamic an object is, the easier it will move through air or water.



Asking questions



Making predictions



Observing and measuring



Setting up tests



Recording data



Interpreting and communicating results



Evaluating