

Sholing Junior School - Science

Topic: Forces

Year: 5

Strand: Physics

What I will learn

I will:

- 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.

Vocabulary

Accelerate	To speed up
Air resistance	The force acting on c
Balanced forces	When objects are still
Friction	The resistance that o
Gravity	The pulling force act
Leaver	A machine that can turn a small force to a bigger one.
Magnetic force	A force -invisible-that acts upon magnetic objects.
Newtons	A measurement of force
Parachutes	A devise that can be used to create air resistance.
Pull force	A force generated by a pull.
Pulleys	Machines that turn a small force into a bigger one.
Push force	A force generated by a push.
Upthrust	A form of water resistance
Water resistance	A force that act upon an object that is in water.



Knowledge

Here are some ways of describing forces:

- A push
- A pull
- A stretch
- A twist

Forces make objects

- Speed up
- Slow down
- Change direction
- Change shape

Forces are measured in newtons.

Isaac Newton is considered one of the most important scientists in history. Even Albert Einstein said that Isaac Newton was the smartest person that ever lived. During his lifetime Newton developed the theory of gravity, the laws of motion (which became the basis for physics), a new type of mathematics called calculus, and made breakthroughs in the area of optics such as the reflecting telescope.

Gravity is the pulling force acting between the Earth and a falling object, for example when you drop something. Gravity pulls objects to the ground. Gravity also holds our universe together, moving the planets in our solar system around the Sun.

Friction and surface resistance is the force on objects moving across a surface, such as an ice-skater skating on ice. Grips on your shoes or car tires use friction to stop you slipping. Shiny surfaces have less friction so they are slippier; rough surfaces have more friction so slow things down. the resistance that a surface or object encounters when moving over another surface or object. Friction both stops and makes things move: it causes things to stick and rub against each other, and also causes slipping and sliding. Air resistance, water resistance and surface resistance are kinds of friction.

Air resistance is the force on an object moving through air, such as a plane moving through the sky. Air resistance affects how fast or slowly objects move through the air; some objects are more streamlined than others, which means the air pulls on them less and they travel faster. A parachute uses air resistance to slow down descent to the Earth.

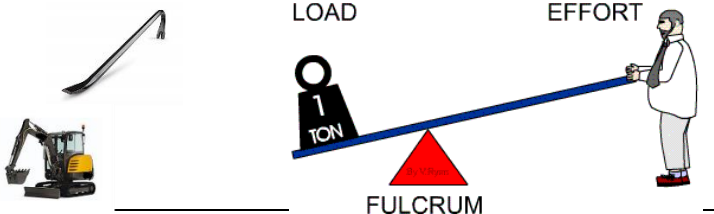
Water resistance is the force on objects floating on or moving in water.

Magnetic force is an invisible force created by electrons. Magnetic force controls magnetism and electricity.

Leavers!

Investigate simple machines such as levers, pulleys, gears, wheels and screws and how they allow small forces to have a bigger impact

Simple machines can be used to turn a small force into a bigger force; this means we can use these machines to accomplish things more easily. Examples of simple machines are levers (which give us extra pushing or pulling force and help us lift great weights), gears (different-sized cogs which work together and give a machine extra force or speed) and pulleys (wheels and ropes used together to lift heavy objects).



Investigate!

We will be exploring falling objects and raising questions about the effects of air resistance. We will be exploring the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall. We'll experience forces that make things begin to move, get faster or slow down. Also, we will explore the effects of friction on movement and find out how it slows or stops moving objects, for example, by observing the effects of a brake on a bicycle wheel. We will also look at the effects of levers, pulleys and simple machines on movement and find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.

We will work scientifically by: exploring falling paper cones or cup-cake cases, and designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective. We might explore resistance in water by making and testing boats of different shapes and we might design and make products that use levers, pulleys, gears and/or springs and explore their effects.