

Previous Knowledge

The shape of some materials can be changed when they are stretched, twisted or bent.

Project Hook or 'Wow' memory

To make a magnetic compass and a game or toy that uses magnets.

The key skills we want pupils to use during this topic:

I can ask relevant questions and use different types of scientific enquiries to answer them. I can set up simple practical investigations, compare things and make fair tests.

I can make organised, careful observations and take accurate measurements using the right units using a range of equipment. I can gather, record, sort and present data in a variety of ways to help in answering questions. I can record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.

I can report findings from investigations, including explaining by talking and writing about them, displaying or presenting results and conclusions. I can use results to draw simple conclusions, make predictions, suggest improvements and ask more questions. I can identify differences, similarities or changes related to simple scientific ideas and processes. I can use clear scientific evidence to answer questions or to support my findings.

Learning Steps

Key Knowledge (answers)

What is a force? What does it do? (Identifying and classifying) Do different objects need greater or less force to make them move? (Fair testing)

A force is a push or pull. These forces change the motion or shape of an object. They will make it start to move or speed up, slow it down or even make it stop. Forces act in opposite directions to each other. Generally, the heavier the object the greater the force that is needed to make it move.

What is friction? Which surface is best at stopping you slipping? (Comparative testing) When would you not need friction?

Different surfaces create different amounts of friction. The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object and the force between them. The more friction there is the slower the movement. The less friction there is the faster the movement EG: ice skates for an ice skater.

Which materials are magnetic? (Identifying and classifying)

Magnetic materials contain iron or nickel or cobalt eg stainless steel. Aluminium and copper are not magnetic. Objects that are magnetic are attracted to a magnet. Magnets produce an area of force around them called a magnetic field. When objects enter the magnetic field, they will be attracted to or repelled from the magnet depending on whether they are magnetic or not.

Does the size and shape of a magnet affect how strong it is? (Pattern seeking)

It is not always the case that the larger the magnet to stronger the force. It depends on how much iron, cobalt or nickel are contained.

How do magnetic poles work? (Research) How can we make our own compass by magnetising a pin?

The ends of a magnet are called poles. One is called the north pole and the other is called the south pole. Opposite poles attract and similar poles repel. The needle of a compass is a magnet. It always points north-south on Earth.

Where are magnets used in everyday life? (Research)

Magnets are used to make a tight seal on the doors to fridges and freezers. They power speakers in stereos, earphones, and televisions. Magnets are used to store data in computers, and are important in scanning machines called MRIs (magnetic resonance imagers), which doctors use to look inside people's bodies. They are also used in simple toys and on credit cards. Magnets range in size from barely-visible specks to industrial monsters weighing tons.

Key vocabulary

Friction

A force that acts between two surfaces or objects that are moving or trying to move across each other. The resistance of motion is when there is contact between two surfaces.

Forces

The pulling or pushing affect that something has on something else.

Magnet

An object which produces a magnetic force that pulls an object towards it or pushes it away.

Poles

North and South poles are found at different ends of a magnet.

Attract

Attraction is a force that pulls objects together.

Repel

Repulsion is a force that pushes the object away. It repels it.

Magnetic Field

The area around a magnet where there is a magnetic force which will pull magnetic objects towards the magnet.

Statutory Requirements

I can compare how different things move on different surfaces.

I notice that some forces need contact between two objects, but magnetic forces can act at a distance..

I can observe how magnets attract or repel each other and attract some materials and not others. I can compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet and identify some magnetic materials.

I can describe magnets as having two poles, predict whether two magnets will attract or repel each other, depending on which poles are facing.

