

Forces and Magnets

What are forces and how do they work?

How can we compare and group everyday materials (linking to KS1 learning) based on whether they are attracted to a magnet?

Physics

Lesson sequence



1. Explore contact and non-contact forces



2. Compare how things move on different surfaces



3. Explore different types of magnets



4. Explore the properties of magnets and everyday objects that are magnetic



5. Understand that magnetic forces can act at a distance



6. Explore the everyday uses of magnets

An end of unit quiz will form part of lesson 6.



Enquiry Types

Careers connected to forces and magnets:
radiographer, magnetic engineer, railway engineer



Concept Links/Prior Knowledge

This is the first time you have been introduced to forces and magnets as a unit of work in science. You will have some prior experiences with magnets from EYFS/Reception, where you will have been able to explore them through your play.

You will make links to your prior learning of everyday materials from Key Stage 1 during lesson 4.

Through the 6 lessons, you will build on scientific knowledge and skills that has already been taught to you, such as reporting on your findings from investigations, using a range of equipment, making systematic observations and taking accurate measurements using standard units.

Sticky learning

New Knowledge

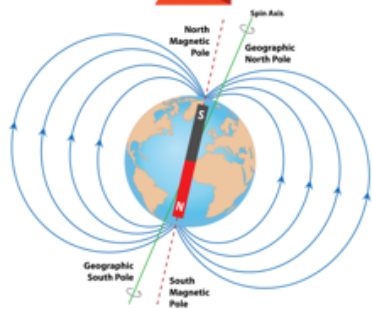
I know and can compare how things will move on different surfaces.
I know that some forces need contact between two objects, but magnetic forces can act at a distance.
I know that magnets attract or repel each other and attract some materials and not others.
I can compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials.
I know the everyday uses of different magnets (for example, bar, ring, button and horseshoe).
I know magnets have 2 poles.

Skills

I can make careful observations and, where appropriate, taking accurate measurements using standard units.
I can report findings from enquiries in a variety of ways (e.g. Oral and written explanations, displays or presentations of results & conclusions).

Visual representations

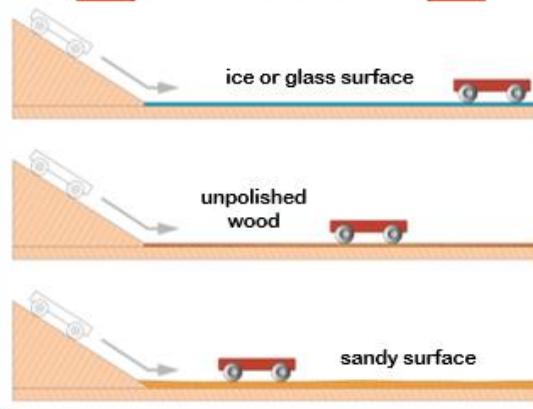
How do magnetic poles work?



The ends of a magnet are called poles. One end is called the north pole and the other end is called the south pole. Opposite poles attract; similar poles repel. If you place two magnets so the south pole of one faces the north pole of the other, the magnets will move towards each other. This is called attraction. If you place the magnets so that two of the same poles face each other, the magnets will move away from each other. They are repelling each other.

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Friction



Forces

- Forces act in opposite directions to each other.
- When an object moves across a surface, **friction** acts as an opposite force. Friction is a force that holds back the **motion** of an object.
- Some surfaces create more friction than others, meaning that objects move across them more slowly.
- On a ramp, the force that causes the object to move downwards is gravity.
- Objects move differently depending on the **surface** of the object itself and the surface of the **ramp**.

non-magnetic



magnetic

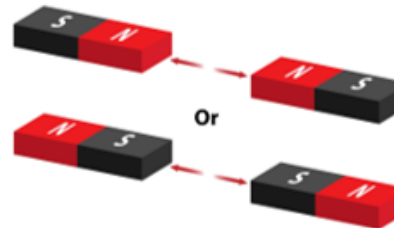


Magnetic Forces

Attraction



Repulsion



Vocabulary revision (vocabulary I have been taught before)

Record
Results
Test
Compare
Observe
Patterns

New vocabulary I will learn (ROCKET WORDS)

force
friction
motion
texture
magnet
attract
repel
magnetic field
non-contact force
magnetism
compass
orientteering