

Science

Forces and Magnets Year 3

Remember when

Change shape of a material by stretching, twisting, bending and squashing. (Y2)

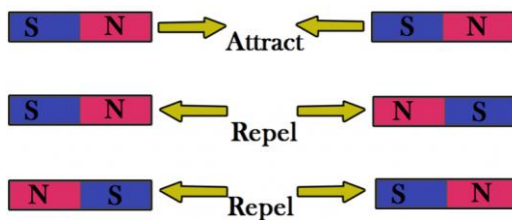
Sticky knowledge

Forces

- A force is a push or pull
- Objects move differently on different surfaces
- A force will speed up or slow down an object

Magnets

- Magnets have two poles- north and south
- North and south poles attract and the same poles will repel
- A magnet attracts magnetic material
- Not all metals are magnetic- only iron and nickel are
- The size of the magnet does not affect its strength
- Magnetism is a non-contact force



Key vocabulary

attract
 attraction
 force
 friction
 magnet
 magnetic
 North pole
 pull
 push
 repel
 repelling
 South pole
 twist
 contact force
 non-contact force
 magnetic force
 strength
 material
 metal
 iron
 steel

National Curriculum:

Compare how things move on different surfaces

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

Observe how magnets attract or repel each other and attract some materials and not others

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

Describe magnets as having two poles

Predict whether two magnets will attract or repel each other, depending on which poles are facing.

Common Misconceptions:

Some children may think:

- the bigger the magnet the stronger it is
- all metals are magnetic.

LO	Knowledge and Skills	Lesson outline
Lesson 1 LO: To understand what a force is Enquiry Type: Grouping and classifying	What is a force? Sticky Knowledge: A force is a push or pull Skill: gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	What is a force? Sort activities into pull/push/both (group activity). Give each small group/pair an activity to act out to show the force in action. Work in small mixed ability groups to freeze frame different push/pull forces.
Lesson 2 LO: To compare how things move on different surfaces Enquiry Type: Comparative and fair testing	How do things move on different surfaces? Sticky Knowledge: Objects move differently on different surfaces A force will speed up or slow down an object Skill: making systematic and careful observations and, where appropriate,	Recap forces; how can we make things go faster or slower? Children will investigate how a toy car moves on different surfaces. Groups to design an investigation (LA supported by teacher/TA) to test the effect of the material on the speed of the car. LA – Group investigation write up with support, prediction, test and conclusion. MA – Write up investigation (word mats and writing prompts) GD – Write up investigation; Describe positive and negative effects of friction.

	taking accurate measurements using standard units, using a range of equipment	
Lesson 3 LO: To know that magnets have two poles and that North and South attract but South South and North North repel Enquiry Type: Observation	<p>Attract or repel?</p> <p>Sticky Knowledge:</p> <p>Magnets have two poles- north and south</p> <p>North and south poles attract and the same poles will repel</p> <p>Skill: Recording findings using scientific language and labelled diagrams</p>	<p>What do you know about magnets? Where do you find them? You could use this opportunity to show how magnets are used in industry.</p> <p>Give pupils a magnet and ask them to say what they notice about it. Explain the poles North and South</p> <p>Work in pairs to observe what happens when they put the magnets together.</p> <p>Introduce the vocabulary attract and repel and ask pupils to practice explaining again with their partner using the scientific vocabulary.</p> <p>Pupils draw diagrams and write an explanation of what happened using scientific vocabulary.</p> <p>Pupils could also make a magnetic compass.</p>
Lesson 4 LO: To know which materials are magnetic and non-magnetic Enquiry Type: grouping and classifying	<p>Magnetic or not?</p> <p>Sticky Knowledge: A magnet attracts magnetic material</p> <p>Not all metals are magnetic- only iron and nickel are</p> <p>Skill: Gather, record and present data in a variety of ways to help in answering questions</p>	<p>Predict which materials will be magnetic/non-magnetic.</p> <p>Explain to children what magnetic means and what non-magnetic means.</p> <p>Use magnets to investigate which materials from the classroom are magnetic/non-magnetic. E.g. scissors, pencils, rulers, split pins.</p> <p>Children record their findings in a table.</p>
Lesson 5 LO: To know whether the size of a magnet affects the strength Enquiry Type: Comparative and fair testing	<p>Does the size of a magnet affect the strength?</p> <p>Sticky Knowledge:</p> <p>The size of the magnet does not affect its strength</p> <p>Skills: setting up simple practical enquiries, comparative and fair tests</p>	<p>Children will predict and test the strength of different magnets (how many paperclips will each pick up) and record in their book.</p> <p>LA/MA – test 5 different magnets; explain prediction (why do you think this?)</p> <p>GD – test 5 magnets; Always/Sometimes/Never: a larger magnet will always attract more paperclips (be stronger)</p> <p>Plenary – What did you find out?</p> <p>Is this the same as what you predicted?</p>
Lesson 6 LO: To know that magnetism is a non-contact force Enquiry Type: Observation	<p>What factors affect magnetism?</p> <p>Sticky Knowledge:</p> <p>Magnetism is a non-contact force</p> <p>Skill: gathering, recording, classifying and presenting data in a variety of ways to help in answering questions</p>	<p>Recap what we know about magnets and forces. If we push someone on a swing, do we have to touch the swing to make it move? Give other examples. This is what we call contact forces. Some forces need contact and some don't.</p> <p>Test magnets through different materials to see whether they still attract.</p> <p>Children could complete a tick/cross sheet. Discussion- Did the magnets work no matter how thick the material was?</p>
Working towards	End of unit assessment Working at Age related expectations	Working at a greater depth

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