

Science

Forces and Magnets Year 3

Remember when

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

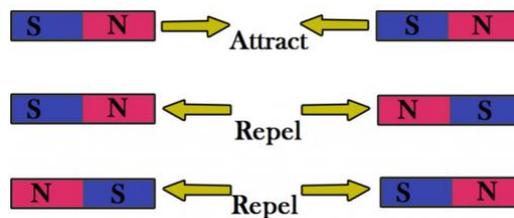
Sticky knowledge

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 pole
North pole
opposite
pull
push
repel
repelling
South pole

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

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