Year 3 – Forces and magnets – How do magnets work?

Lesson 3

Lesson	3 of 5

Learning objective

I can compare and group everyday materials based on whether they are attracted to a magnet.

National Curriculum links

NC Y3:

Children will:

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

Working scientifically:

- making systematic and careful observations
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

Key lesson question	Which materials are magnetic?

Resources

- lesson presentation (PPT)
- magnets
- activity investigation worksheets
- research worksheets and fact file
- objects/materials to test: magnetic metals, non-magnetic metals, other non-magnetic materials

Teaching input

- **Scientific enquiry** – Review the 'scientific enquiry types' and 'working scientifically' skills the children will use in this lesson, highlighting identifying and classifying, and interpreting and communicating ideas on the slide.
- **How do magnets work?** – Show the unit lesson sequence, highlighting today's question "Which materials are magnetic?" so children understand where the lesson fits in the overall learning journey.
- **Key vocabulary for this lesson** – Introduce the key words for this lesson using the link icons to aid recall. Explain the meaning of these words using objects and actions where possible.
- **Identifying and classifying** – Holly introduces us to the use of magnets for recycling, to separate magnetic and non-magnetic materials.
- **Let's watch** – Watch the clip and notice how the magnet attracts some objects. Share the new word alert. Ask what children already know about magnets. Take feedback from the class before revealing the answers on the following slide. On the following slide, watch the children in the clip playing a game using magnets to move metal discs on a maze. Link the observation to the previous lessons on forces. To be able to move, there must be a force acting on the metal disc. Discuss the questions on the slide and take feedback. Answers are reviewed on the following slide.
- **Let's investigate** – Review the answers. Now the children will watch the clip about how magnets work and then explore how paper clips move towards the magnet (pulling force) without contact. Share the new word alert. Review what they found out through their investigating on the following slide. Sentence starters are available to support discussion.
- **Magnetic materials** – Holly has an idea about testing if all metals are magnetic. Children should think about how they can carry out a test. Sentence starters will help to organise their ideas before making a prediction on the following slide.
- **Investigation** – Ask the children to investigate and classify materials as either magnetic or non-magnetic. They should first write down their prediction. Then they observe what happens when they move a magnet close to the objects and record their observations on their activity investigation worksheet.
- **Results** – Discuss what the children found out. Ensure children understand that a prediction is what we think before the investigation – it does not need to be correct, but it would help inform our predictions for the next investigation.
- **Researching** – Ask children to find out why some metals are magnetic and others are not. They can use books, the internet or the magnets and magnetic forces fact sheet included with the lesson resources. After completing their research, share the information on the following slide – this gives an explanation of which metals are magnetic, and which are not.
- **Challenge** – Children read the statement and question. They should discuss their ideas with their learning partners using the sentence starters. Take feedback from the class before revealing the answers on the following slide.

Main activity

Investigation – Children test materials to see if they are magnetic or non-magnetic. Record their findings using the activity worksheet. **Adapt** this by using sorting hoops for children to place the objects or use different coloured labels to represent magnetic and non-magnetic.

Research – Children can use books, the internet or the fact file to research why some metals are magnetic, and others are not. An adapted worksheet and question prompts are available in the lesson resources. Text–to–speech audio readers could be used to access the research information. Children can present their findings verbally.

Challenge

Children are asked to consider the statement and question about magnets. You are at the beach.
You lose your ring and some money in the sand. You have a magnet with you.
Do you think using the magnet will help you find your lost items? Why or why not? Explain your answer.
Sentence starters given to support answers.

Cumulative quiz questions

7. If a material is attracted to a magnet, it is a _____ material. (magnetic)
8. Which materials are not magnetic? (plastic spoon and ceramic mug)
9. True or false? All metals are magnetic. (false)

Self-assessment

- I can test materials to see if they are magnetic or non-magnetic.
- I can explain why some metals are magnetic and others are not magnetic.
- I know that a magnetic force acts without touching an object.

Key vocabulary

attract – to make something move closer
pull – a force that brings an object closer
force – something that makes an object move, stop, change shape, speed or direction