Magnetic and non-magnetic materials

Nature & technology > Substances in everyday use

Difficulty level	Group size	Preparation time	Execution time
easy	2	10 minutes	10 minutes

This content can also be found online at:

http://localhost:1337/c/60882cad6e938800032dd9d2

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Teacher information

Application

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Magnetic board

Not all substances or materials are attracted by a magnet, but only magnetic substances such as iron, cobalt and nickel. The fact that these materials are attracted by a magnet is a characteristic (material) property for these materials. These materials are therefore also referred to as "magnetically". This property will be used in waste separation by separating magnetic and non-magnetic materials.

In this experiment, students investigate the effect of a bar magnet on different materials. They find that not all metals are magnetic and conclude that magnetic objects must have a common material property.

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Other teacher information (1/2)

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Previous knowledge

- This experiment serves as an introduction to the topic of "magnetism" or substance properties.
- No prior knowledge is required to perform the experiment.

Principle

- Not all materials are magnetic, but only iron, cobalt and nickel, for example.
- Magnetic materials are therefore attracted to a magnet.

Other teacher information (2/2)

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Learning objective

- Magnets attract only certain materials
- The magnet has different attracting sections

Tasks

- Students will test different materials to see if they are attracted to the magnet.
- You check that both ends of the magnet also attract the material equally.

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Safety instructions

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The general instructions for safe experimentation in science lessons apply to this experiment.

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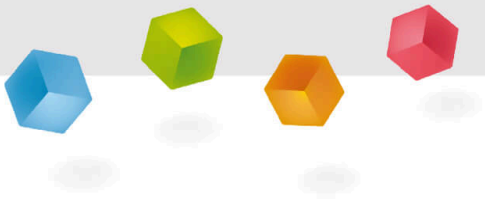

Student Information

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Motivation

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Screwdriver on magnetic bar

In everyday life, you often encounter magnets that you often don't even notice. Many objects or devices take advantage of the fact that certain materials are attracted to magnets:

- Closure: Handbags or smartphone cases often have a magnetic closure so they don't come undone on their own.
- Remove dents: A strong magnet can be used to remove a dent from a car door.
- Screwdrivers: The tip of many screwdrivers is magnetic so that you don't lose the screw so easily.
- Magnetic bar: You can hang various objects such as knives, keys or tools on it.

Tasks

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- Check which materials are attracted to a magnet.
- Also check whether both ends of the magnet attract the material equally.
- Before you start the experiment, think about what objects will be attracted to the magnet.
- Note down your experimental observations and answer the questions in the report.

What does the magnet attract?

What objects are attracted to the magnet?

- ☐ Glass
- ☐ Stainless steel
- ☐ Plastic
- ☐ Aluminium

Check

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Equipment

Position	Material	Item No.	Quantity
1	Conductors/non-conductors,l-50 mm	06107-01	1
2	Magnet, d=8 mm, l=60 mm	06317-00	1

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Additional Equipment

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Position	Equipment	Quantity
3	Paper clips	
4	Iron nails	
5	1/2/5/10 cent coins	

Procedure (1/3)

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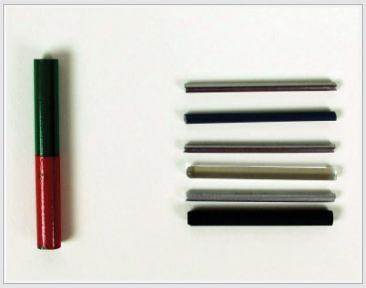

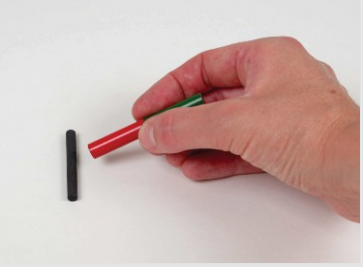

Put all the sticks from the set "Ladder and non-ladder" in front of you on the table.

Take the magnet in your hand and hold it with the red side close over each of the bars.

Compare what influence the magnet has on the individual bars.

Put the sticks all back on the table.

Now turn the magnet around and hold it with the green side close over the bars.

Again, observe what effect it has on the bars and compare your results. Does the green side behave differently than the red side?

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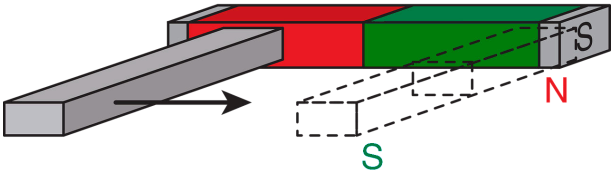
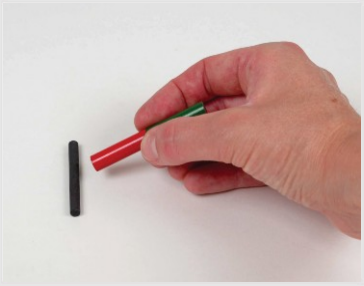
Procedure (2/3)

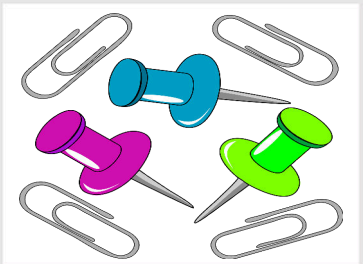
Take one of the rods that are attracted to the magnet.

Hold it against the magnet and check that it is attracted equally everywhere.



Procedure (3/3)



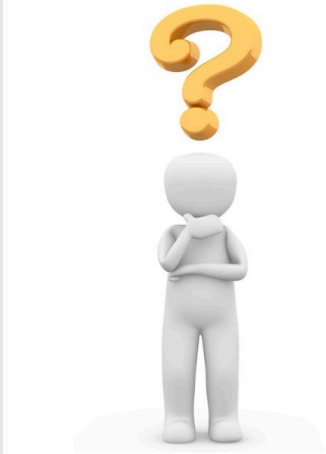


Take the magnet and examine other objects around you.

For example, take paper clips, nails, coins, and other items you have with you.

Can you find any others that behave like some of the staffs?

Think about what these items might have in common.



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Report

Task 1

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Write down your observations as you investigate the magnet's attraction.

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Task 2

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Difference of the sides of a magnet?

Does the green side of the magnet attract different objects than the red side?

- ○ True
- ○ Incorrect

Check

Task 3

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Which money coins are attracted to the magnet?

- ☐ 5 cent coin
- ☐ 1 cent coin
- ☐ 10 cent coin
- ☐ 2 cent coin

Check

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Task 4

Are all metals attracted to magnets?

- yes
- no

Slide	Score / Total
Slide 8: Miscellaneous items	0/1
Slide 16: Difference of the sides	0/1
Slide 17: Coins	0/3
Slide 18: Multiple tasks	0/2

Total 0 / 7

Solutions | Repeat | Export text

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