Bell task

These are videos of the aurora borealis which are visible near the North Pole.

What could cause this?

I think the Northern lights could be caused by…

Magnetism

Objectives:

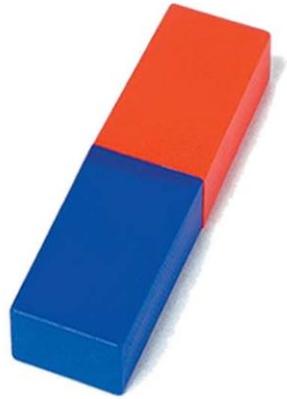
Investigate magnetism.

Apply knowledge of magnetic and non-magnetic materials to new contexts.

Success criteria:

- I can name the variables in an experiment and list the magnetic metals.
- I have applied my knowledge of magnets to practice questions.
- I can explain what causes the Northern Lights.

Key words: pole; opposite; attract; magnetic field; energy store.



T,P,S: What are magnets?

What can they be used for?

Which materials are magnetic?

You will be given a pot of materials and use a bar magnet to test which materials are magnetic.

What are the variables?

Independent (changed) — Material

Dependent (measured) — Magnetism

Control variables (kept the same) — Bar magnet

1. **BEFORE** you start the practical write a hypothesis (prediction), use the success criteria (bottom) to choose your level:

I think … is/isn't magnetic because…

2. Record your results in a table like this →

3. Write a conclusion:

The magnetic materials were…

My hypothesis was right/wrong.

Material	Magnetic?
Nickel (may be rubbed off the metal)	
Charcoal	

Magnetic metals– **iron**, **nickel** and **cobalt** (attracted to the bar magnet)

NOTE – these are not magnets themselves, they are magnetised by the bar magnet. Only magnets can repel each other.

Skill	Low	Medium	High
2.3 Hypothesis	Make a prediction for an experiment.	Make a prediction and **explain** your reasoning.	Make a prediction and use **scientific reasoning** to explain it.

Steel is not on our list of magnetic metals, so why is it magnetic?

Magnetic metals– **iron**, **nickel** and **cobalt** (attracted to the bar magnet)

Steel is an **alloy**, it is made from iron and carbon.

Iron + Carbon → Steel

Alloy – mixture of a metal with other metals or elements to form a new compound.

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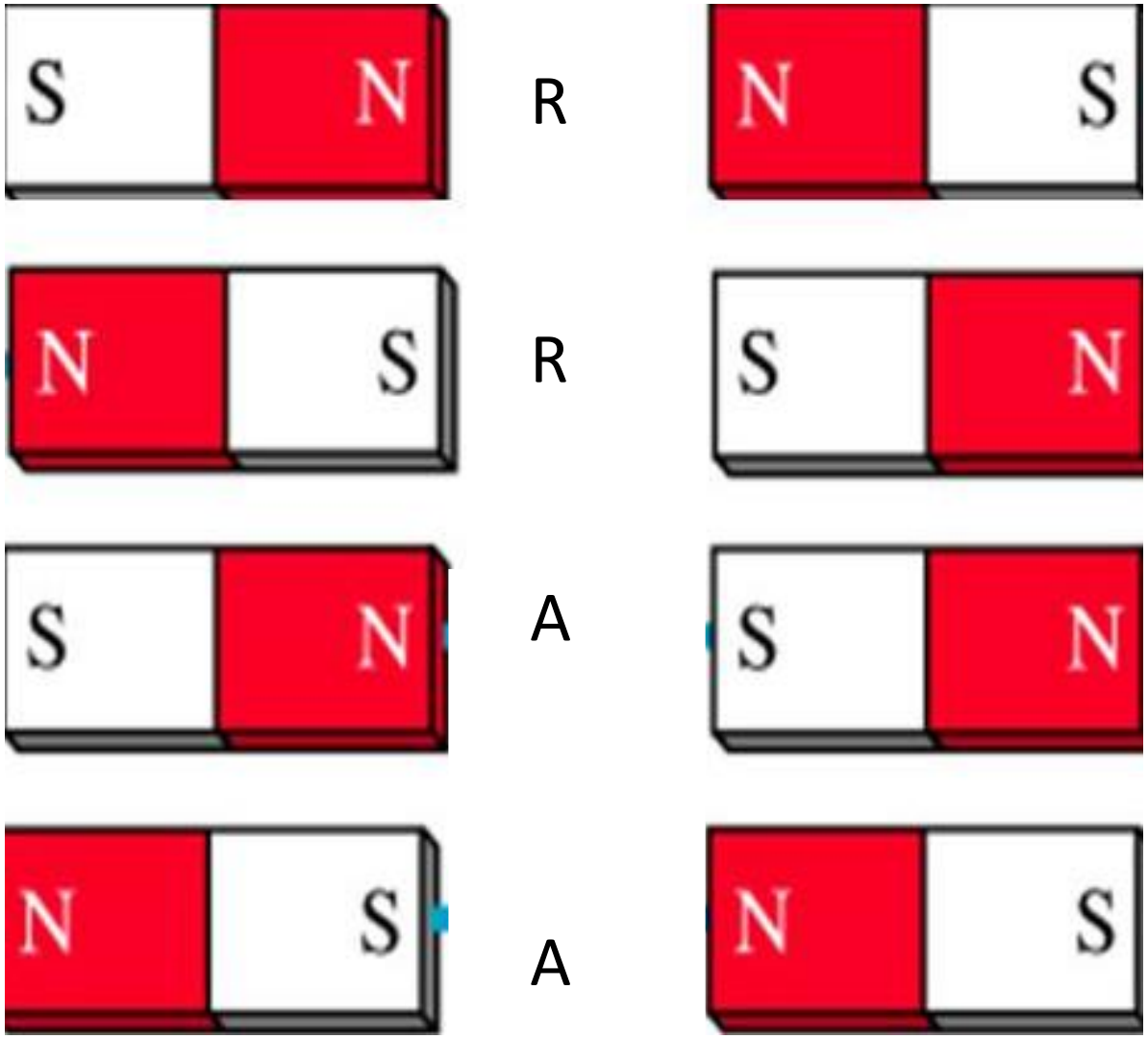
Magnets: attract or repel?



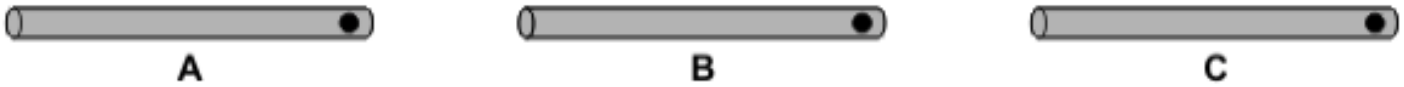
Sketch these magnets, will they attract or repel?

Complete the summary sentences.

Like poles…	Repel
Opposites poles …	Attract

Checkpoint – answer on your sheet

Hannah has three rods (A, B and C) made from different metals.
One rod is a **magnet**; one is made of **copper**; and one is made of **iron**.
She does not know which rod is which.



Each rod has a dot at one end.

(a) Hannah uses **only** a bar magnet to identify each rod.
She puts each pole of the bar magnet next to the dotted end of each rod.

Complete Hannah's observations in the table below.
Write if each rod is **copper**, **iron** or a **magnet**.

test	observations	type of rod
 	attract attract	Rod A is ..... .
 	nothing happens	Rod B is ..... .
 	attract	Rod C is ..... .

(a) • iron

1 (L6)

• nothing happens

*accept 'nothing' **or** 'no force' **or** 'it does not attract or repel'*

***both** answers are required for the mark*

copper

1 (L6)

• repel
a magnet

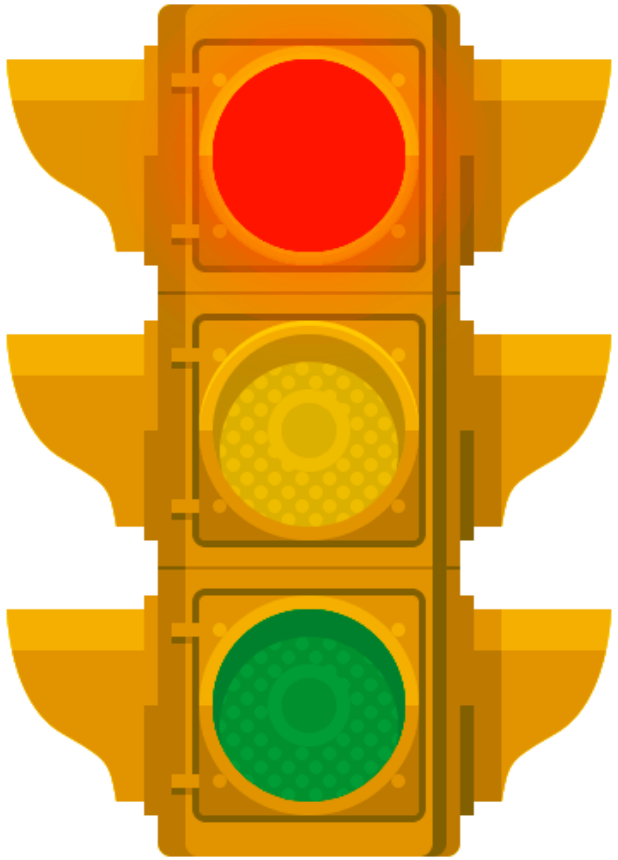
accept 'move apart'

***both** answers are required for the mark*
*do **not** accept 'magnetic'*

1 (L6)

Applying your knowledge:

You must complete at least 2 of the 4 sheets.



Magnets 1

Magnet worksheet 2

Magnetic pigeons

Challenge – complete the magnetic north sheet

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Northern Lights

https://www.youtube.com/watch?v=eJV_wlCm6ms

Key terms: magnetosphere, plasma, atmosphere, react, light.

Who named the Aurora Borealis and what does this name mean in Latin?

Galileo Galilei named them and it means, “dawn of the North”.

What causes it?

Moving molten iron in the Earth’s core caused the magnetosphere to form around the Earth. It protects the planet from dangerous solar materials (plasma) that can travel at around 1 million mph.

Some of the plasma enters at the poles where the magnetosphere (Earth’s magnetic field) is weakest. This reacts with gases in our atmosphere causing bright light.

Challenge – name the energy stores involved

Sun – thermal, plasma moving through space – kinetic, reacting with gases – chemical, light.

Plenary

In magnetism, poles that are _____ will attract each other. Poles that are _____ will repel each other.

(answers: opposite, alike/the same)

Write 3 questions which can be answered by any of these key terms:

nickel, cobalt, iron, steel, magnet, magnetism, poles, north, south, attract, repel.

Checkpoint

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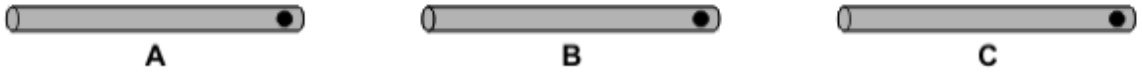

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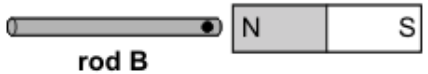
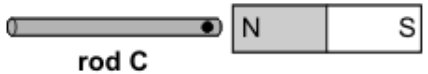
 rod A	attract	
 rod B	nothing happens	Rod B is ..... .
 rod B	.....	
 rod C	attract	Rod C is ..... .
 rod C	.....	

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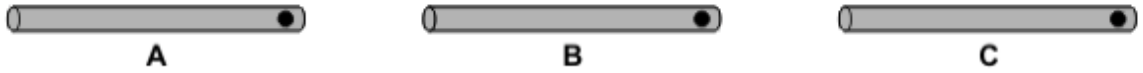

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 rod B	nothing happens	Rod B is ..... .
 rod B	.....	
 rod C	attract	Rod C is ..... .
 rod C	.....	