Magnetism

Answer the questions below:

1. State the SI unit of force and the piece of equipment used to measure it.
   Newtons (N), measured using a Newtonmeter
2. Is magnetism a contact or a non-contact force?
   Non-contact
3. Explain the difference between contact and non-contact forces.
   Contact forces need objects to be directly touching each other whereas non-contact forces can act over a distance.
4. True or false: all metals are magnetic.
   False
5. Explain your answer to Q4.
   There are only three magnetic metals.

Do Now



22/05/2024

Magnetism

P2.2.2

Science
Mastery



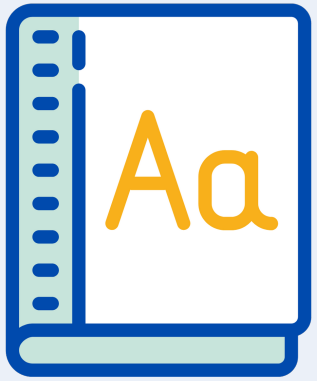
P2.2.1 Prior Knowledge Review
➢ **P2.2.2 Magnetism**
P2.2.3 Magnetic Fields
P2.2.4 Electromagnets
P2.2.5 Investigating Electromagnets
P2.2.6 Investigating Electromagnets Analysis
P2.2.7 Earth's Magnetic Field



Following this lesson, students will be able to:

- Explain what a magnetic material is and give some examples.
- Describe what is meant by a permanent magnet.
- Predict the effects of placing like and unlike magnetic poles near each other.

Key Words:



permanent magnet **north pole** **repel**

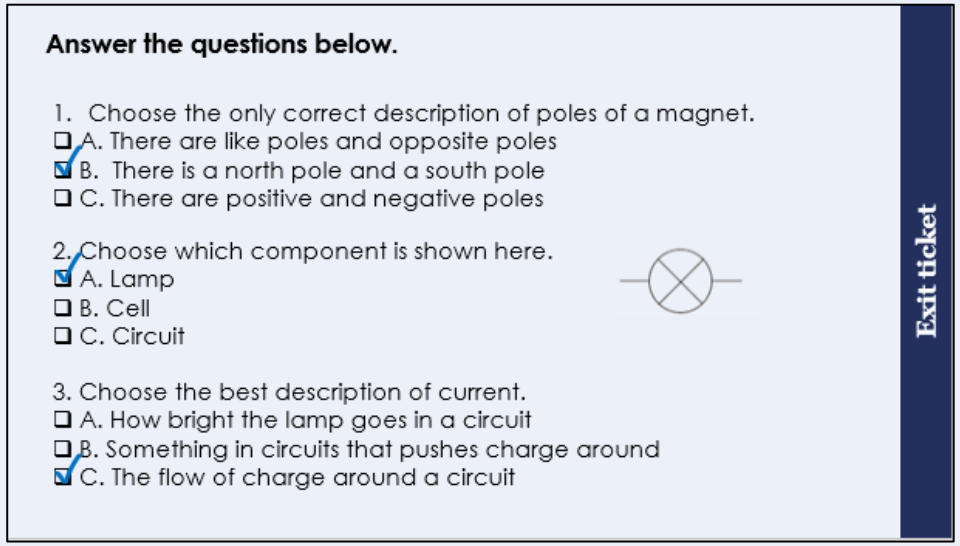
south pole **attract** **magnetic material**

Lesson Objectives

This is the fix-it portion of the lesson

The **fix-it** is an opportunity to respond to gaps in knowledge, especially those identified by the previous lesson's exit ticket.

- The teacher should customise this slide as needed, to facilitate
  - **reteach**, **explanation, demonstration** or **modelling** of ideas and concepts that students have not yet grasped or have misunderstood.
  - **practise** answering specific questions or of key skills.
  - **redrafting** or **improving** previous work.



Fix-it

Vocabulary

General Definition

Verb: cause someone to have a liking for someone

Scientific Definition

When a pulling force brings objects towards each other

Attract

'What we think, we create, what we feel, we attract, what we imagine, we become'.

Buddha

Synonyms

Engage
Draw
Captivate

Antonyms

Repel
Deter
Put off

General Example

Universities and colleges look to attract students by offering a range of courses

Scientific Example

Opposite magnetic poles attract



Magnetism through the ages



The ancient Greeks and Chinese used magnets to make compasses.

Compass – a magnetic pointer which can turn to show direction.



They discovered that a stone called **lodestone** attracted other materials to it. At the time, many believed this to be magic.

Later, an Englishman William Gilbert (1540-1603) was the first person to investigate magnetism using modern scientific methods.

Magnetic Force

Magnetic materials exert a non-contact force on each other. This force is called **magnetic force**.

Only some metals are magnetic.

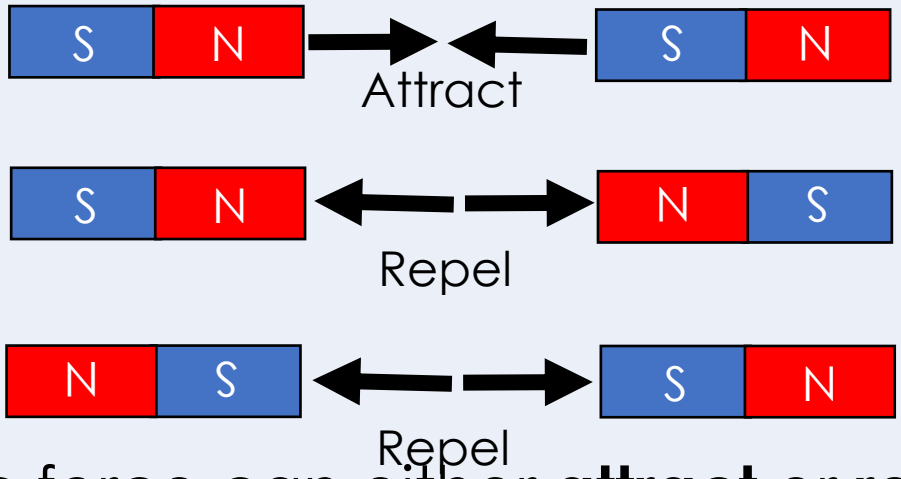
Iron, nickel, cobalt and their alloys (materials which contain them, such as steel which contains iron) are **magnetic metals.**

Most other metals, for example aluminium, copper and gold are not magnetic.



Attract or repel?

The magnetic force is strongest at the **poles** of a bar magnet.
Bar magnets have a north and south pole.





The magnetic force can either **attract** or **repel**.

When **unlike** (opposite) poles (North and South) are brought close together they **attract.**

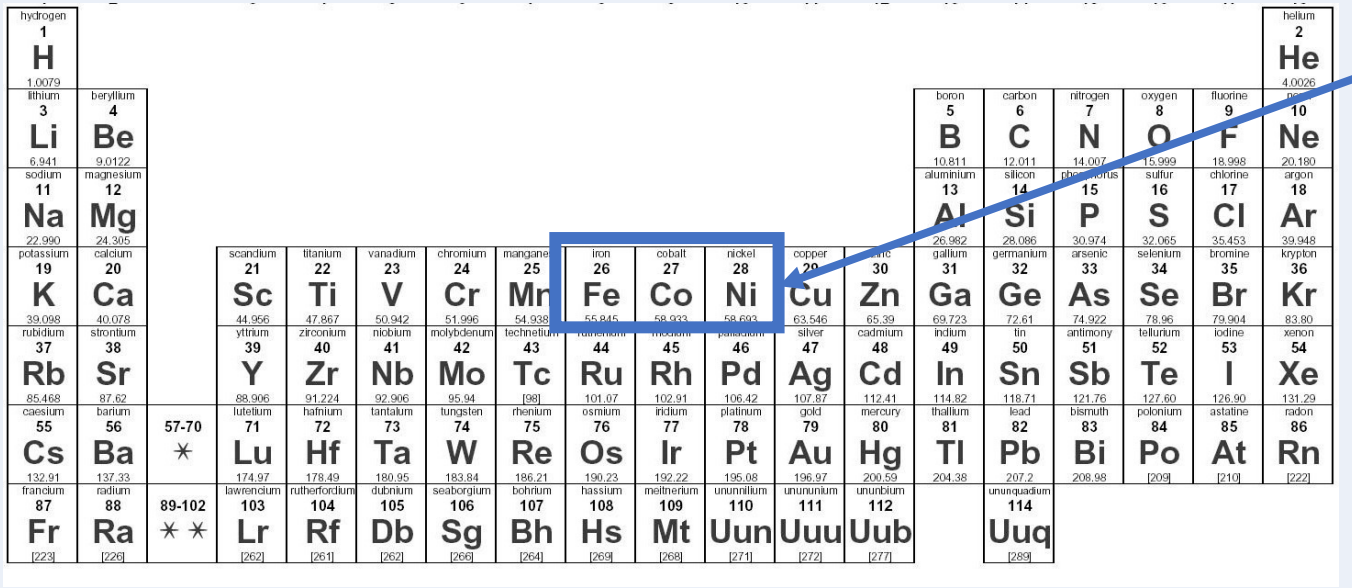
When **like** poles (North and North or South and South) are brought close together they **repel.**

When a magnetic material is brought close to a magnet it is always **attracted** to the magnet.

Permanent magnets

Bar magnets are **permanent magnets**. They stay magnetic all of the time.

Next lesson we will learn about **induced magnets.**



Permanent magnets are made from magnetic materials: iron, nickel and cobalt.

Determine if each statement is true or false

1. Magnets don't work through paper. **False**
2. All magnets are permanent. **False**
3. Iron, steel, nickel and cobalt are all magnetic. **True**
4. Magnets produce a force on other magnets. **True**
5. Like poles attract. **False**
6. Forces are non-contact if they can work from a distance. **True**
7. The magnetic force is strongest in the middle of a bar magnet. **False**

Check for understanding

Which statements do you agree with?

All metals are magnetic

Most metals are magnetic

Bigger magnets are stronger than smaller magnets

All silver coloured metals are magnetic

Talk Task

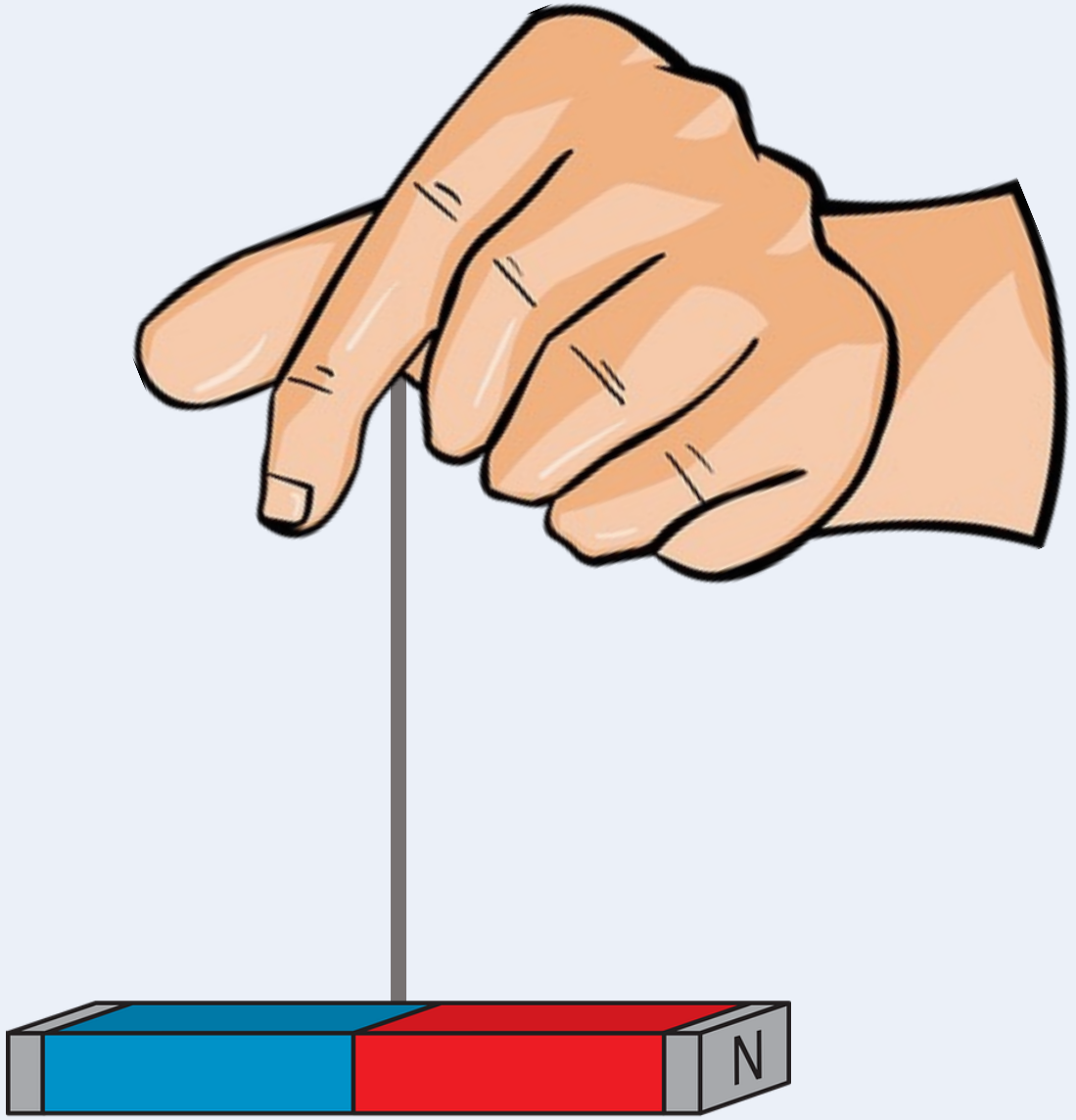
Attraction or Repulsion?

A student is holding a magnet on a string.

What will happen to the magnet if they bring a North pole towards it?

What will happen to the magnet if they bring a South pole towards it?





Talk Task

Answer the questions below.

1. A permanent magnet:
   - ☑ A. always keeps its magnetic properties
   - ☐ B. can be turned off
   - ☐ C. is always made of iron

2. Examples of magnetic materials include:
   - ☐ A. Iron, Silver, Copper
   - ☑ B. Nickel, Iron, Steel
   - ☐ C. All metals

3. Which of these statements is false?
   - ☑ A. north and north poles attract
   - ☐ B. north and south poles attract
   - ☐ C. south and south poles repel

Exit ticket

Feedback

Lesson P2.2.2	
What was good about this lesson?	What can we do to improve this lesson?

Send us your feedback by clicking this link. Thank you!