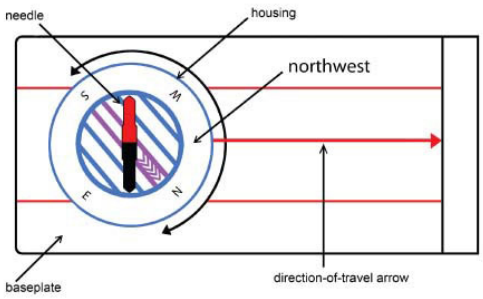
How It Works: A Magnetic Compass by Kate Ruttle

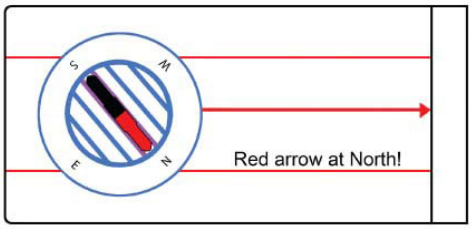
No matter where you stand on Earth, you can hold a compass in your hand and it will point north. For most of us that's an interesting trick, but for sailors and explorers it's life-saving. Before the compass was invented by the Chinese in the 11th century, sailors only had the stars and the sun to guide them – which is fine when the weather is clear, but is of no use if it's raining. A compass doesn't care what the weather is like ... it always points north! But why?



How does a compass work?

Think of the planet Earth. Now imagine that it has an enormous bar magnet hidden inside it, going straight through the centre. The south pole of the magnet points somewhere near the North Pole on Earth. And, since opposites attract, the north end of our compass needle points towards the South Pole of the enormous bar magnet!

Of course, there isn't a bar magnet inside the planet Earth, but for some reason – no one quite knows why – much of the rock that makes up the planet is magnetic.



What does a compass look like?

A compass is an extremely simple device. It consists of a small, lightweight magnet balanced on a nearly frictionless pivot point. The magnet is generally called a **needle**. One end of the needle is coloured red to indicate that it points towards the north.

Around the needle is a moveable 'housing'. This has the letters N, S, E, W marked on it to indicate the directions north, south, east and west. Some compasses also show the intermediate directions: northeast, northwest, southeast and southwest.

Many compasses are set in a transparent baseplate which has lines on it to show the 'direction of travel'.

How to use a compass

If you want to go northwest:

1. Work out where on the compass housing northwest is.
2. Turn the compass housing so that northwest on the housing aligns with the large direction-of-travel arrow.
3. Turn the entire compass until the compass needle is aligned with the lines inside the compass housing.
   Warning: when you turn the compass, make sure that you don't touch the housing.
4. Check that the red, north, part of the compass needle points at north on the compass housing, otherwise you'll set off in entirely the opposite direction!
5. Move off following the direction-of-travel arrow. You will now be going northwest.

Name:	Class:	Date:

1 Why do you think the writer included diagrams at the beginning of this text?

2f
1 mark

2 What is the main purpose of this text?
Choose **one**.

- to explain what N, S, E and W mean and where they are ☐
- to introduce the reader to map reading ☐
- to help the reader understand how compasses work ☐
- to tell the reader the name of all the parts of a compass ☐

2c
1 mark

3 After the introductory paragraph, the text has headings to divide it into two sections. Write **three** ways in which the first section is different from the second section.

2h
1 mark

4 Why did the writer tell the reader to "*think*" and "*imagine*" in this section?
"*Think of the planet Earth. Now imagine that it has an enormous bar magnet hidden inside it*" (paragraph 2).

2g
1 mark

5 Match the technical term with its description.

needle show	direction of travel
housing	movable ring which lists directions
baseplate	magnet
arrows	always points north
red part of needle	goes underneath the compass

2b
1 mark

6 Explain how the opening paragraph tries to interest the reader. Give examples from the text to support your ideas.

2f
2 marks