

# Magnetism

YEAR 5

Spring 1



# **LESSON 3**

*How does a compass work?*




### Do Now – Retrieval

1) Complete the definition of magnets below:

Magnets are objects that            or            other magnetic objects or materials.

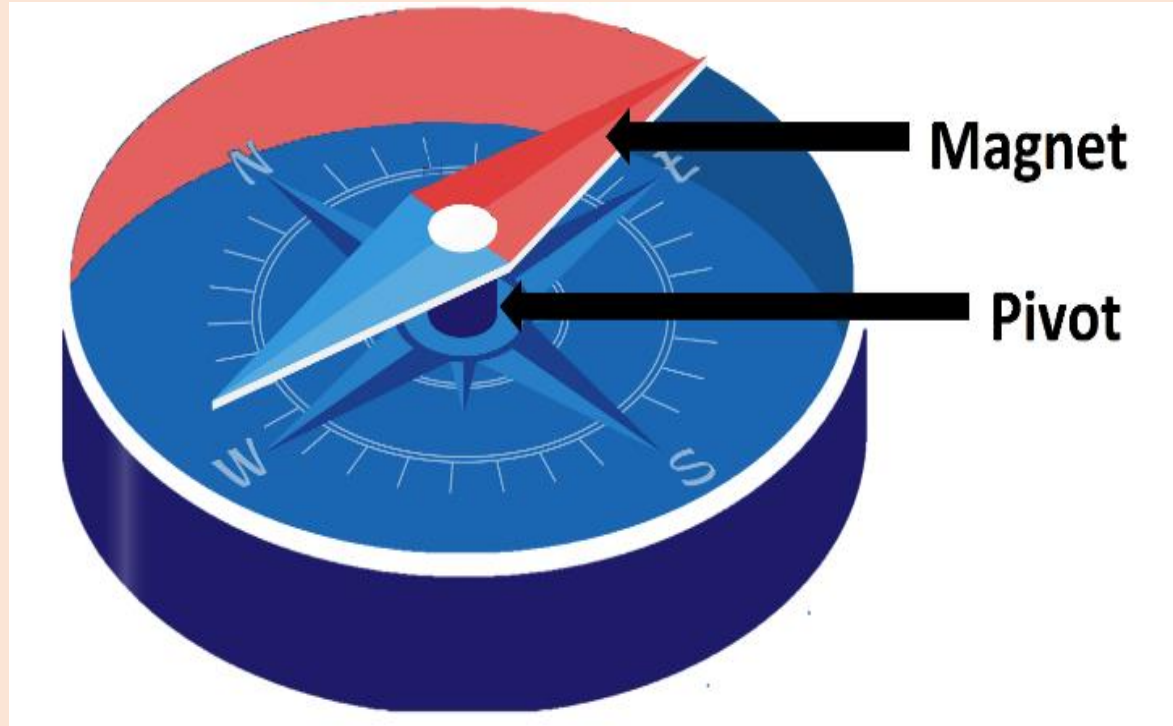
2) Write down whether the magnets would 'attract' or 'repel' in each of the examples below:

Place the north side and the south side together 	Attract or repel?
Place the south side and the north side together 	Attract or repel?
Place the north side and the north side together 	Attract or repel?
Place the south side and the south side together 	Attract or repel?

From previous learning:

How do you separate the following mixtures of solids?

- Use a            to separate the mixture if one of them is a magnetic material
- Use a            to separate the mixture if small solid particles are mixed with large ones





### Read the following passage about compasses

It is believed that a form of a compass was first used in ancient China. Originally, they used a lodestone (a piece of stone with magnetic properties) hanging on a piece of string. This always pointed south.



**Where was the first compass used?**

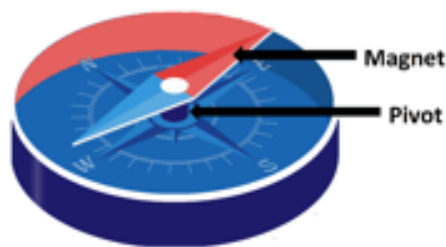
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**What was the first compass made from?**

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Over time, the use of a compass spread across the world to become what it is today. The modern day compass is a small, thin magnet made from steel which is placed on a pivot. The pivot is a small, pointed object that the magnet balances on. This means the magnet can spin around easily to point upwards to the north (and downwards to the south).



The reason a compass points north (or south at the bottom end of the compass) is because the middle of the earth is filled with iron so it behaves like a giant (but very weak) magnet. So when the magnet on a pivot is free to spin, the compass lines up with the earth's magnetism.



**What is the middle of the earth filled with?**

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**What does the Earth act like a giant version of?**

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This is especially helpful if you want to know which way to go if you are lost and can't use the sun or stars to see which way to go. However, because a compass is essentially just a magnet, if it is placed near another magnet, instead of lining up with the earth's magnetism, it will line up with the magnetism of the nearby magnet.



**Why are compasses helpful?**

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**What happens if you put a compass next to a magnet?**

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**Watch a demonstration of how a compass works**



**Label the parts of the compass below**





Watch the video that shows how a home-made compass is created ([https://www.youtube.com/watch?v=4\\_tQQFHpSa4](https://www.youtube.com/watch?v=4_tQQFHpSa4)). Discuss the questions below with a partner.

- 1) How did the person make the steel magnetic?
- 2) Why did they place the needle and paper onto water?
- 3) What safety precautions would someone have to take if they were going to try this themselves?





**Use the mini-compass you have been to do the following tasks:**

- 1) Slowly rotate the compass in your hand – what do you notice?
- 2) Can you point to where the north side of the classroom is?
- 3) Can you point to where the south side of the classroom is?
- 4) Can you point to where the east and west sides of the classroom are?
- 5) Can you follow instructions from your teacher to navigate a course around the classroom using the directions, north, south, east and west?

If there is time – you may be able to complete a course outside or in the hall



Write instructions for the treasure hunters to get from the start to the end. Use the directions North, South, East and West (the first one has been done for you).



STEP 1 – Move 3 blocks west

STEP 2 – Move \_\_\_\_\_ blocks \_\_\_\_\_

STEP 3 – Move \_\_\_\_\_ blocks \_\_\_\_\_

STEP 4 – Move \_\_\_\_\_ blocks \_\_\_\_\_

STEP 5 – Move \_\_\_\_\_ blocks \_\_\_\_\_

STEP 6 – Move \_\_\_\_\_ blocks \_\_\_\_\_

STEP 7 – Move \_\_\_\_\_ blocks \_\_\_\_\_



**Why were compasses so helpful to people sailing in boats no matter what the weather was like?**