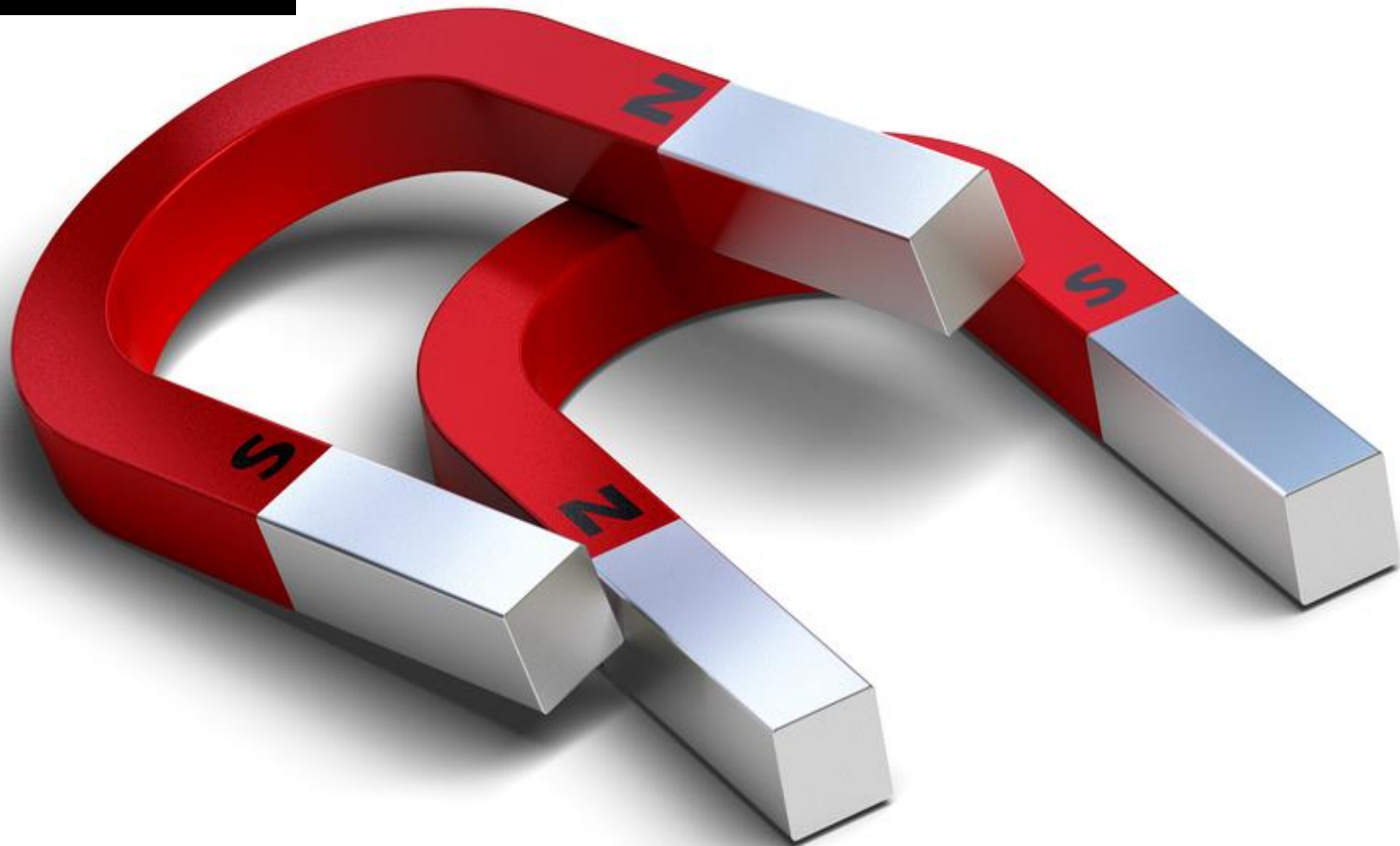


Magnetism

YEAR 5

Spring 1



LESSON 4

How can we see a magnetic field?



Do Now – Retrieval

1) What are compasses?

Compasses are small, thin m_____ that sit on a pivot which enables them to s_____. They will point upwards to the n_____ with the bottom pointing towards the s_____.

2) Why are compasses helpful?

3) What happens if you put a compass next to a magnet?

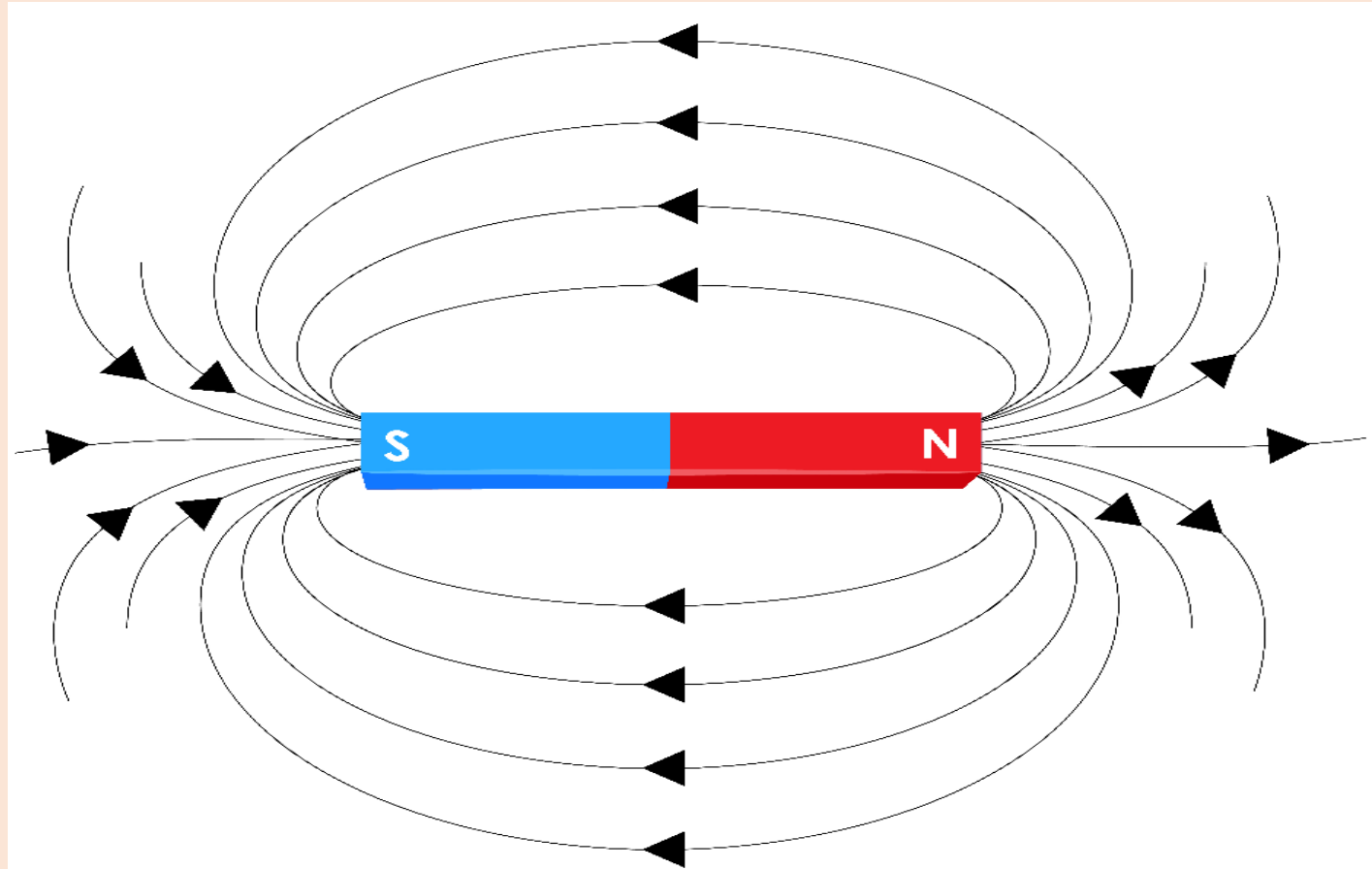
4) Label the parts of the compass below:



From previous learning:

What happens to the movement of particles in solids, liquids and gases when they are heated?

In a solid, the particles will _____ more. In liquids and gases, the particles will move with a _____.





Read the following passage about field lines

How can we know a force will act somewhere if we can't see it at all? The area in which an invisible force will act is known as the 'field' of a force. We know that there will be a magnetic force acting between magnetic materials and a gravitational force acting between any object and the earth but how can we tell what the size and direction of the force will be?



What is the 'field' of a force?

The 'field' of a force is an area in which an i_____ force will a_____.

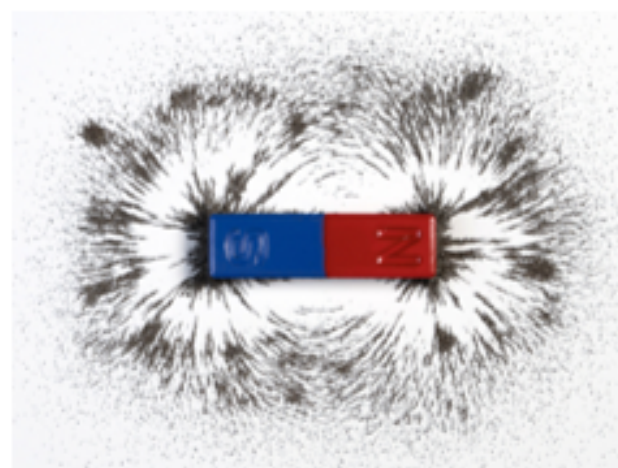
To help us know what the force will be in a particular place we can draw 'field lines' to show a picture of how the force changes in different places. This is like a map to show us the force around an object.



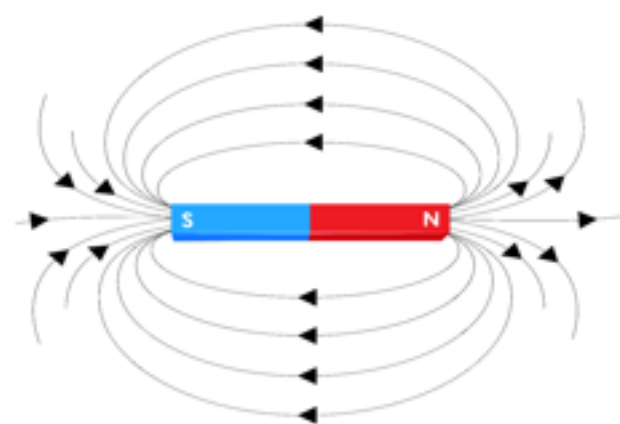
What does a picture of field lines tell us?

A picture of field lines is like a m_____ of an invisible force to show where a f_____ will act in different p_____ around an object.

One way we can 'see' the field is to place lots of things that are affected by the force around the object, for example iron filings (which are like an iron powder) around a magnet:



Another way we can 'see' the field is that we can plot (which means 'draw up') the field lines by measuring how the force acts in different places (for example, by using a compass near a magnet), drawing an arrow to show the direction and connecting these arrows together in a line. This makes a diagram like the following one:



What are the two ways that you could see a magnetic field?

1. Place i_____ f_____ around a magnet
2. Place a c_____ in different places around a magnet and draw the direction of the force at each of these places.

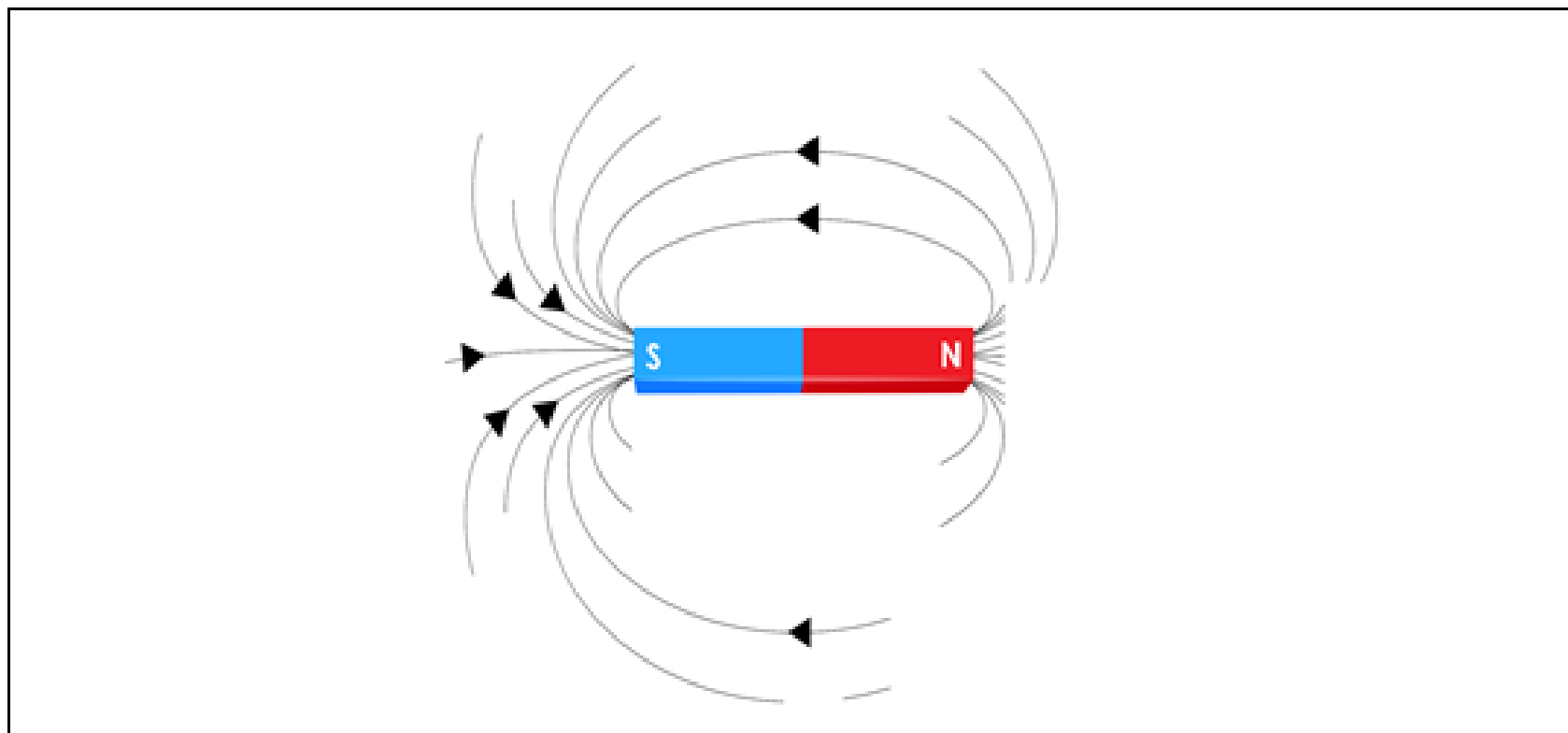


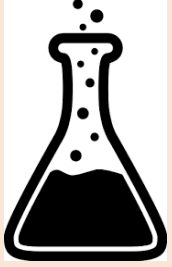
Watch the demonstration of how to use iron filings to show a magnetic field

(<https://www.youtube.com/watch?v=VkSQX5VpYpQ>)

(<https://www.youtube.com/watch?v=2oUTI2pPuzY&t=1s>)

Finish the sketch below to show the field lines you could see around the bar magnet





Use a compass to plot the magnetic field with the help of your teacher. (https://www.youtube.com/watch?v=_RcgAsuevq8)
(<https://www.youtube.com/watch?v=DMO373nDp8M>)

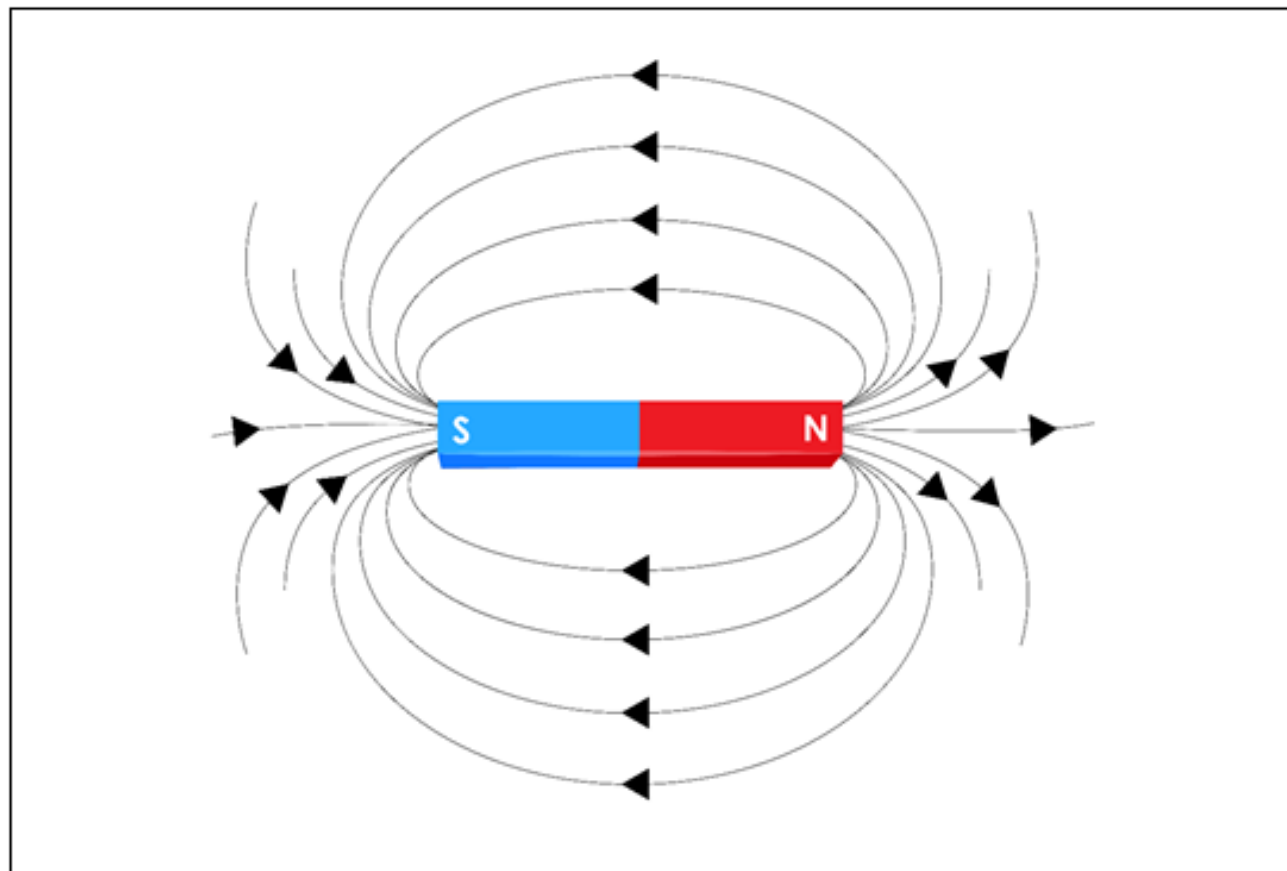
Stick in the field lines you have made into the space below:





Label the diagram below to explain what the field lines tell us

The magnetic field is strongest when the field lines are closest together. Circle the areas where the field lines are strongest and fill in the sentence below the diagram.



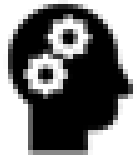
The magnetic field is strongest close each _____ of the magnet.



Watch the videos below to see how 'magnetofluid' can be used to see field lines in 3 dimensions:

<https://www.youtube.com/watch?v=kL8R8SfuXp8>

<https://www.youtube.com/watch?v=ILOZ-ScDIZU>



How do we know the force of magnetism exists if we can't see it?