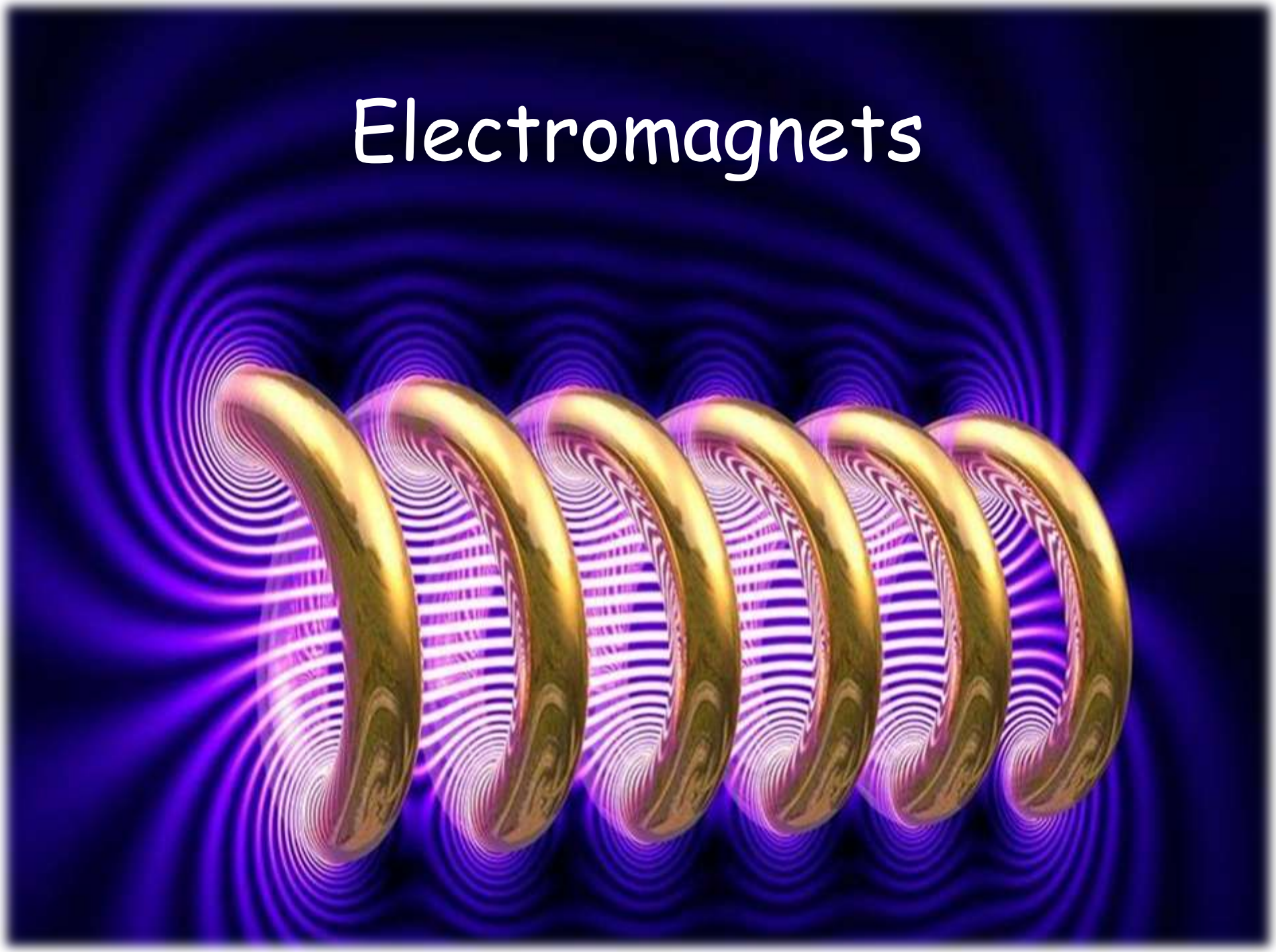
Electromagnets



Investigating Electromagnets

WALT: Make an electromagnet and investigate its strength

<u>ACTIVITY</u>: If I am the answer, what is the question? 2 minutes to 'answer' in pairs:

1. Align the magnets North to North
2. Because it contains mostly iron
3. Stroke an iron nail with a magnet and rest it on water

By the end of the lesson, I should

- Understand that passing an electrical current through a wire creates a magnetic field.

- Be able to use electromagnets to plan and carry out an investigation.

Yesterday we learnt how to make a magnet by stroking a piece of metal with a magnet

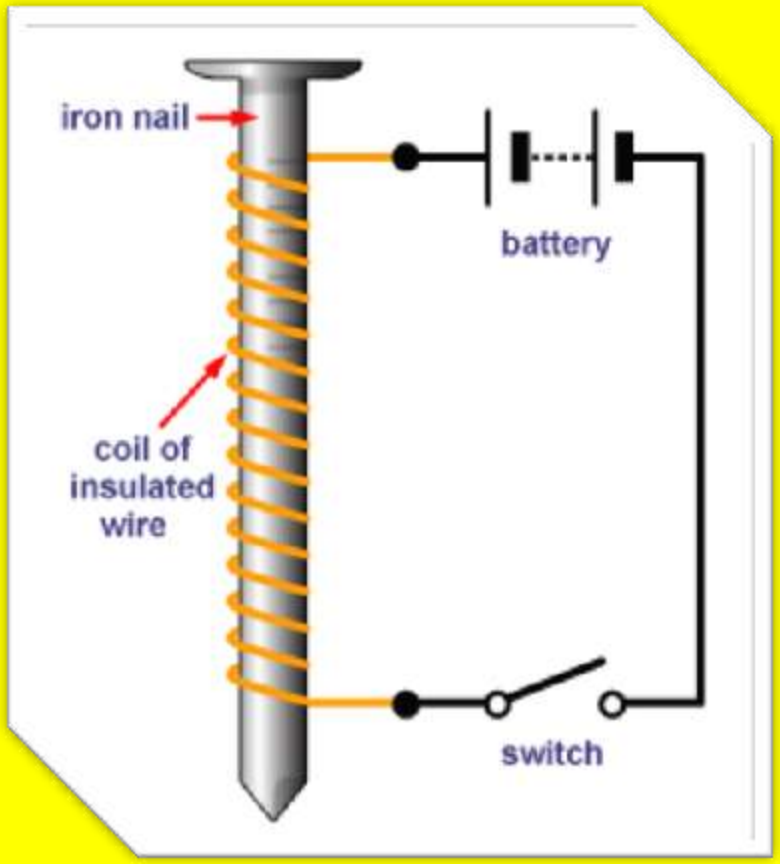
- Today, we are going to learn how to make a magnet by passing electricity around a coil of wire wrapped around an iron nail

An electromagnet is…..

A magnet that uses an electrical current. It can therefore be very strong and turned on and off.

http://www.youtube.com/watch?v=BQA5VDXE7ts

How to make an electromagnet...



- Wrap the wire around the iron nail.
- Connect a crocodile clip to each end of the wire
- Plug the other end of the wires into the cells.
- Turn the switch on.

Your Investigation…

Mr T. has given up his career in acting and has decided to buy a scrap-yard in Kangemi. He's only been there a month and already the giant magnet he uses for moving scrap cars around has broken. Mr T. wants you to carry out an investigation into electromagnets to help him decide whether it's worth buying one.

These are the questions I want answered fool;

- Do more coils in the wire make an electromagnet stronger?
- How many cars (paper clips) can your electromagnet attract with 80 coils?
- What happens if you add more?

We are investigating how increasing the number of coils in an electromagnet affects the strength of the electromagnet.

Input Variable – What could we change?

Outcome Variable – What could we measure?

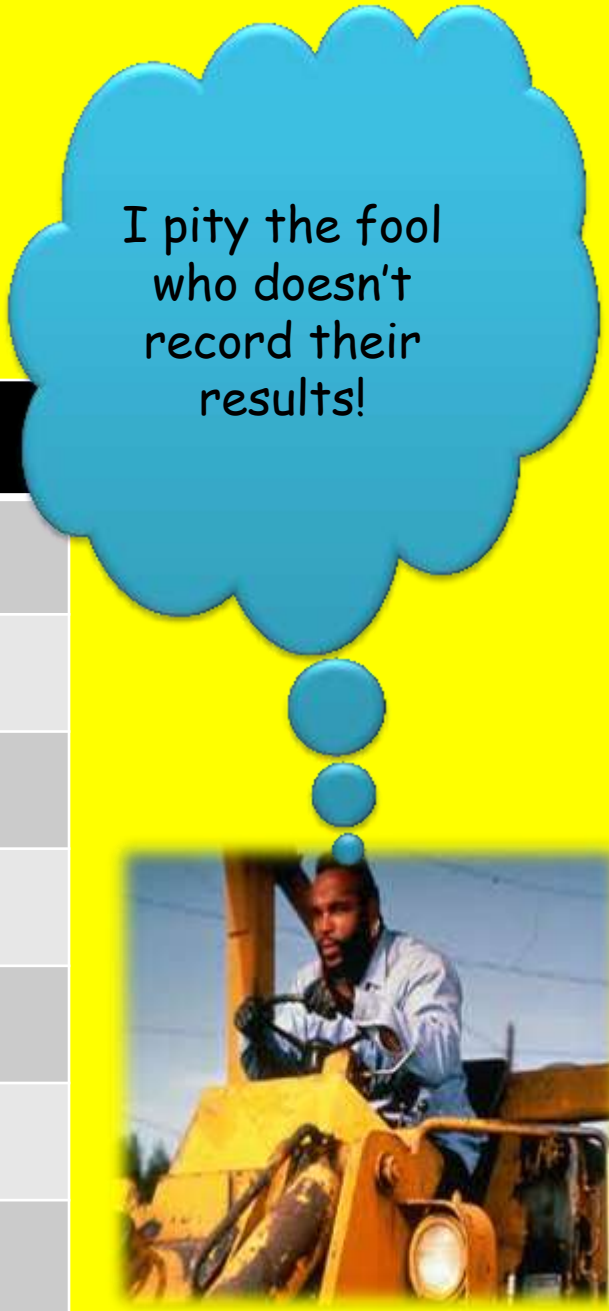
How will we make this a fair test?

What is our hypothesis (prediction)?

Results Table

Draw a table like this one in your books ready to carry out your investigation;

Number of Coils	Number of Paperclips



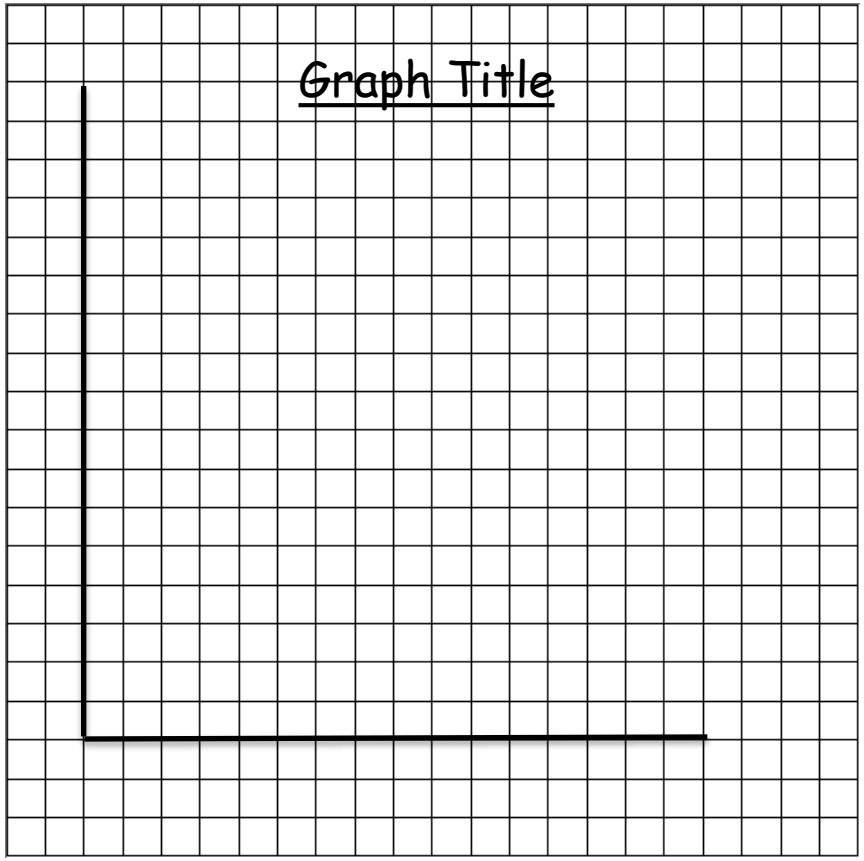
When finished

- Write up a diagram of the experiment, method and conclusion.

- Next, spend 5 minutes designing another experiment to test the effect of one of the below on the strength of an electromagnet. What do you keep the same and what do you change?
  - Type of core (e.g. iron versus steel)
  - Strength of current

If you finish all of the above…

Draw a line graph showing how the number of coils affects the strength of the electromagnet.



- Write a title for your graph
- The x axis (horizontal) should show the input variable
- The y axis (vertical) should show the outcome variable

Plenary

So fool, what did you find out?

Now you must spend 1 minute writing down 3 things you learnt today. Share you ideas with two friends and add their ideas to your list.