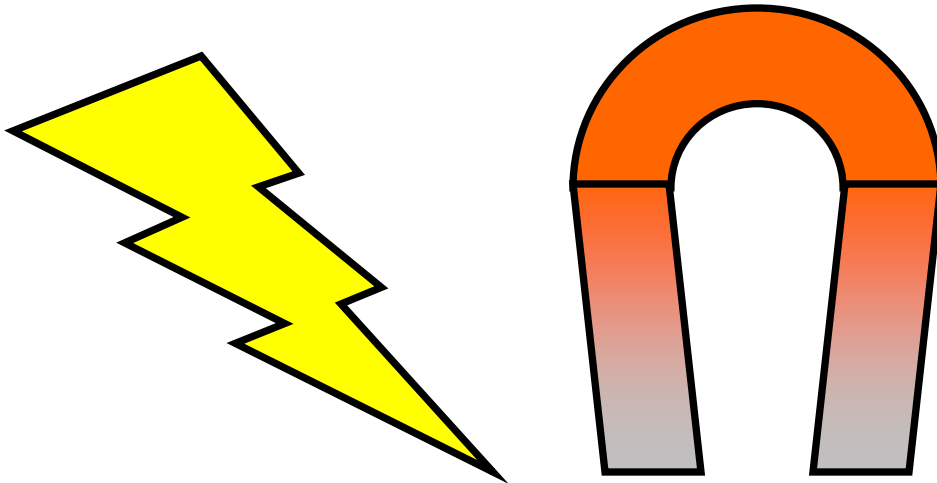


Explore@Bristol

Magnets and Electricity ▶▶ Trail

Magnets and electricity have an important relationship. Use this trail and take a trip around **Explore@Bristol** to find out how it works and where it can be used.



Name _____ Date _____

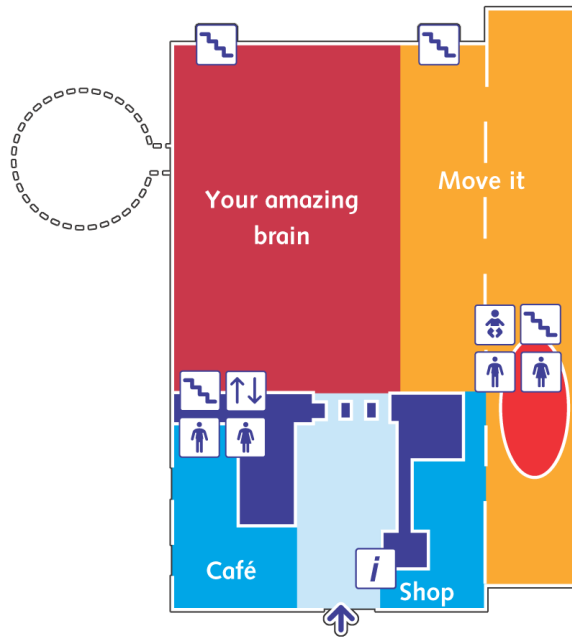
✓ Tick box

 Write or Draw

 Discuss

Explore Map

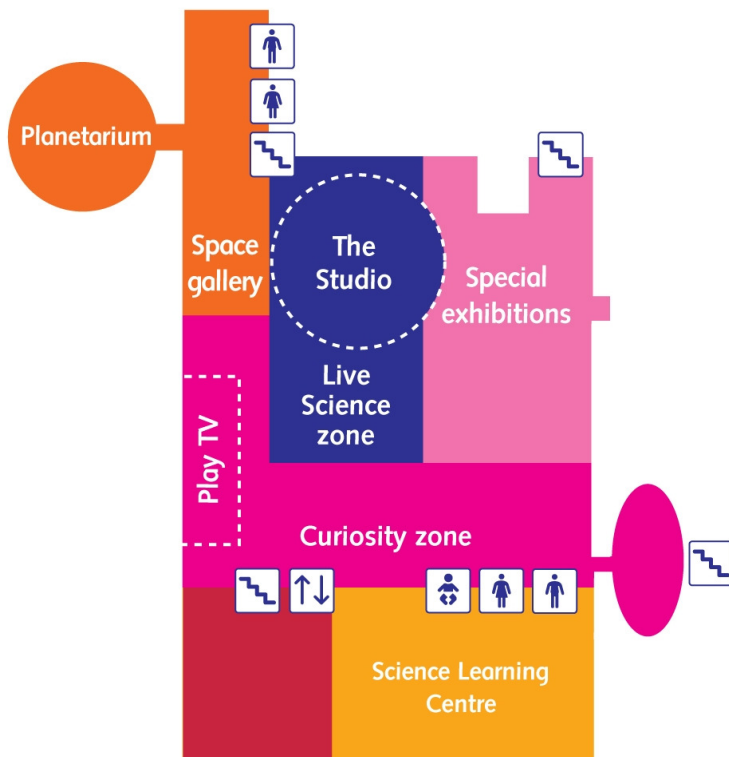
Follow the trail around these exhibitions within **Explore**.
These are the exhibits you'll need to find on your journey.



Ground Floor

Your amazing brain

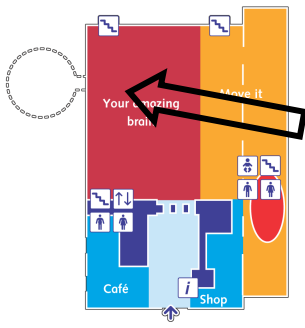
- Fire a neuron
- Store it



First Floor

Curiosity zone

- Magnet tubes
- Black sand
- Lightning spark



Go to Your amazing brain (Ground Floor)

1

Fire a neuron

Our brains use electricity to send messages. The electricity travels through tiny nerve cells called neurons. Press the buttons to make the neuron fire.



When the neuron fires what happens to the lights at the top?



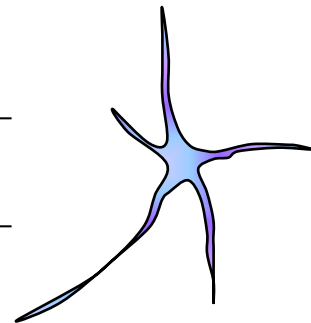
How many light bulbs can you count in total on the neuron?

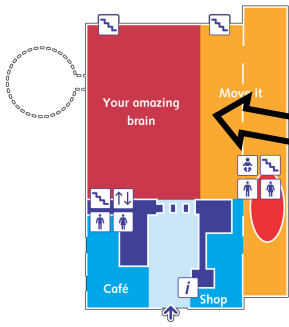


How many different sounds can you hear when you press the buttons?



See how quickly you can make the neuron fire. What can you do to make it fire more quickly?





Go to Investigate it
(Ground Floor)

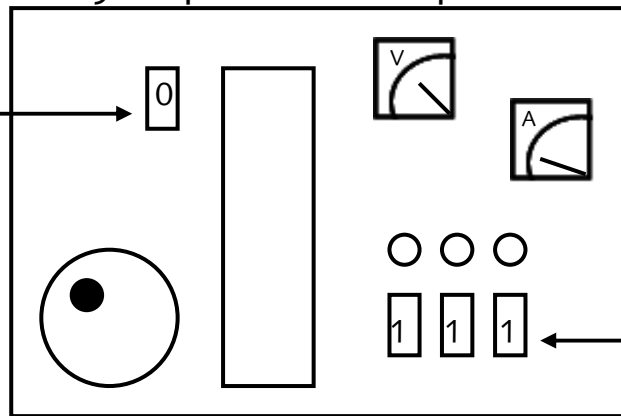
2

Store it

The silver cylinder is called a capacitor. It works a bit like a rechargeable battery. It can store electrical energy to be used later.

To begin, generate electricity by turning the wheel and watch the bulbs light up. Turn the capacitor off so it is not being used.

Switch the capacitor off - 0



Switch the bulbs on - 1

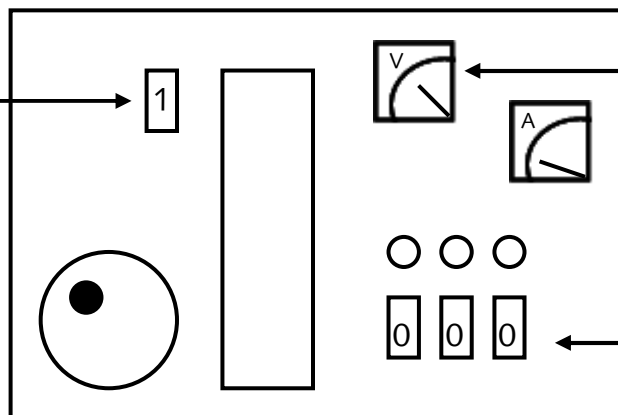
Which sentence best describes how the bulbs look?

The bulbs are glowing steadily

The bulbs are flickering

Now charge up the capacitor by switching it on and switching the blubs off. As you turn the wheel watch the 'V' level rise.

Switch the capacitor on - 1



Watch this meter go up

Switch the bulbs off - 0

When the capacitor has been charged, stop turning the wheel and switch on the bulbs (*leave the capacitor switch on*).

Which sentence best describes how the bulbs look?

The bulbs are glowing steadily

The bulbs are flickering

Why do you think this has changed? Discuss your ideas with your group.

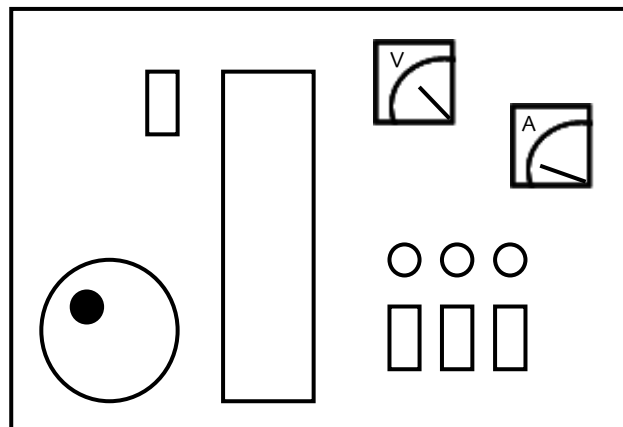


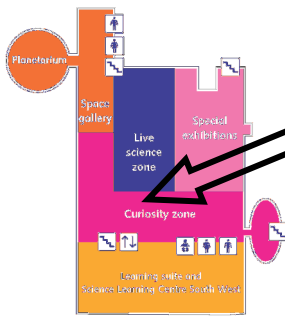
Imagine these bulbs are lights in your home. Would you prefer the electricity to be stored in a capacitor before it is used? Why?



Challenge: how can you make a bulb glow as brightly as possible?

Try out your ideas, then complete the diagram below with instructions for someone else to follow.





Go to Curiosity zone (First Floor)

3

Magnet tubes

Drop the magnet down the tubes made of different materials.



Before you begin make a prediction. How fast do you think the magnet will drop in the different tubes? Write your predictions in the table.

Speed of magnet	Tube
Slowest ↓ Fastest	

Now drop the magnet down the tubes and write your results in the table.



Speed of magnet	Tube
Slowest ↓ Fastest	



Complete the sentence.

The magnet falls slowest in the _____ tube



Did this result surprise you? Discuss it with your group.



Why do you think the magnet falls at different speeds? Circle the answer you think is correct.

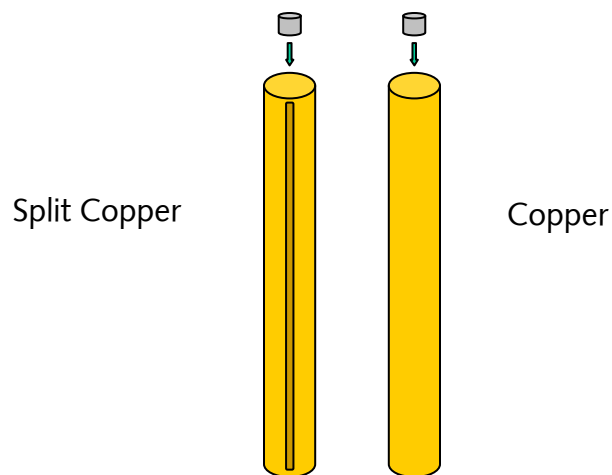
The tubes are different lengths.

The magnet weighs different amounts in different tubes.

The magnet attracts in some tubes, speeding it up.

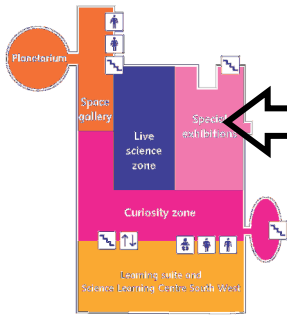
The falling magnet creates an electromagnet force in some tubes slowing it down.

What two differences can you spot between dropping the magnet down the copper tube and the split copper tube?



Difference 1: _____

Difference 2: _____



Go to **All about our world**
(first floor)

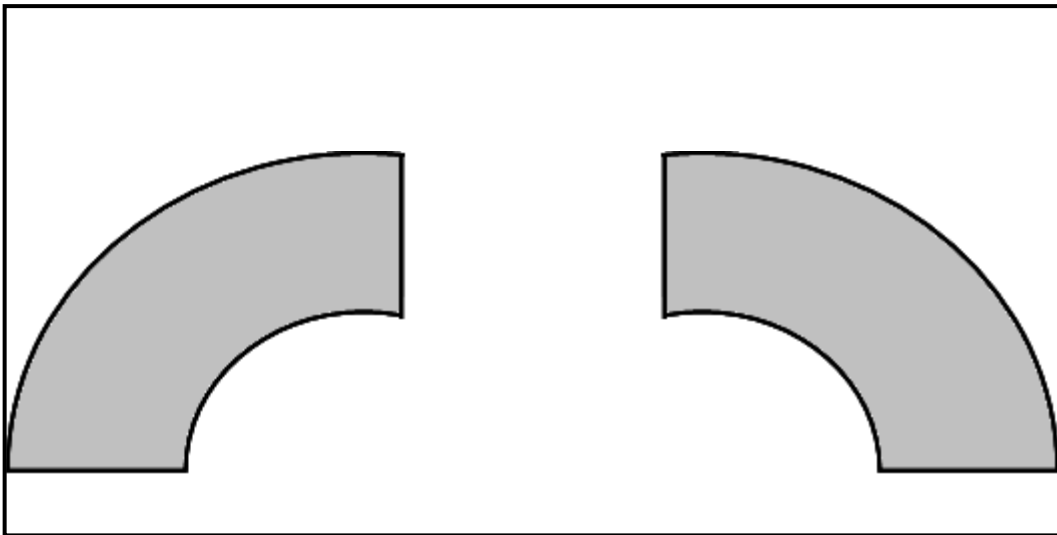
4

Black sand

Pick up some of the black sand and sprinkle it over the two large pieces of metal. Watch what happens.



Draw the black sand on the diagram below



What is special about the two big pieces of metal?



Why do you think the black sand behaves in this way?
Tick the best description.

The black sand is sticky

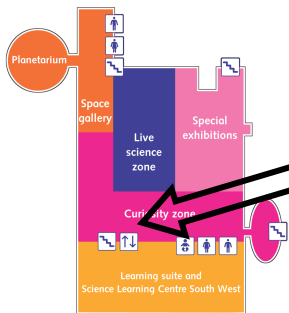
The black sand is magnetic

The black sand is electric

What might happen if you put your hand over the metal then sprinkle the black sand onto your hand?



Discuss this in your group and then test your ideas.



Go to Curiosity zone (First floor)

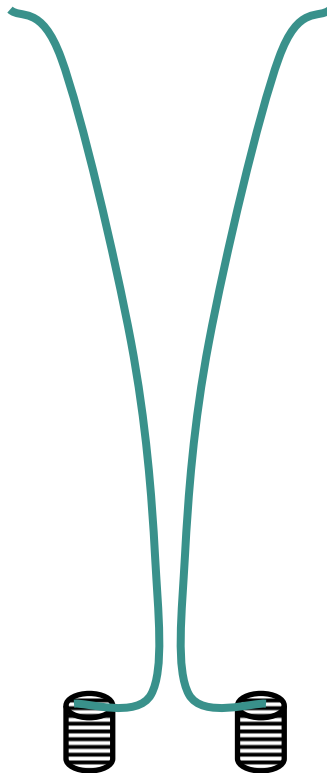
5

Lightning spark

Lightning is a natural form of electricity. Press and hold the button to make a lightning bolt.



Draw what you can see when you press the button.



What colours can you see in the spark?



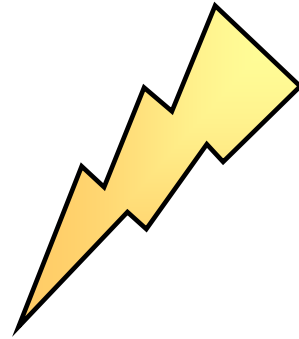
What can you hear?



What are the rods made of?



What would happen if the rods were made of plastic instead of copper?



Would you still get a lightning spark if the copper rods were joined together by another copper rod at the top? Why? Discuss this with your group.