


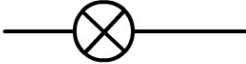

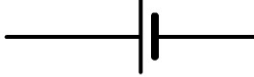
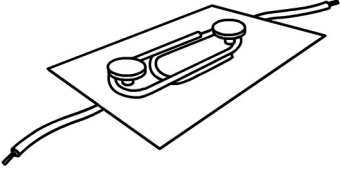

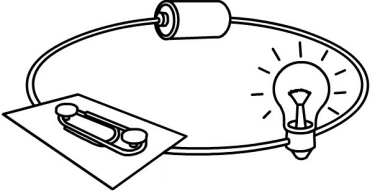
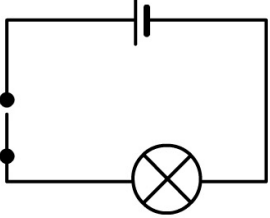
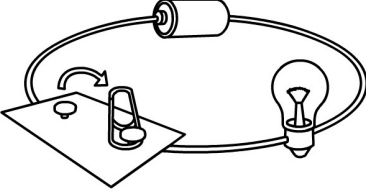
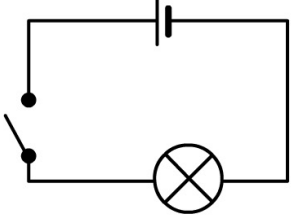


# Circuit diagrams and symbols (1)

Name: \_\_\_\_\_

## Circuit Symbols

We remember how we put the circuits together by using a diagram or drawing a sketch. In order to save time and ensure that sketches are accurate, scientists came up with a novel way of showing the components of a circuit using special symbols. These symbols are used all over the world and help scientists, engineers and technicians to draw or record circuits more quickly and accurately.

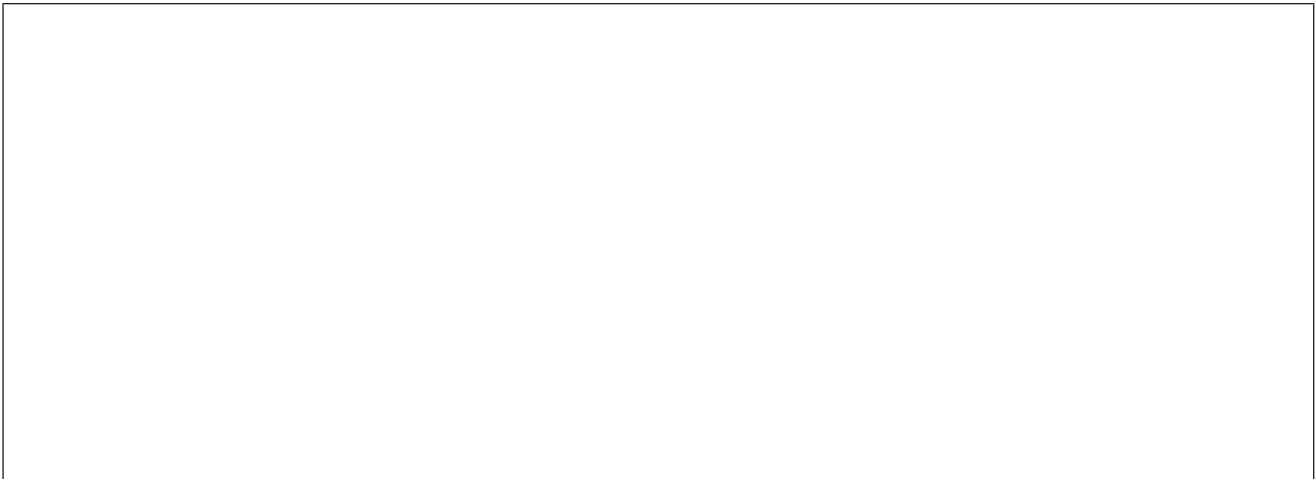
Component	Sketch	Symbol
Wire		
Light bulb		
Battery (cell)		
Switch		
Closed circuit		
Open circuit		

# Circuit diagrams and symbols (2)

## Drawing Circuits

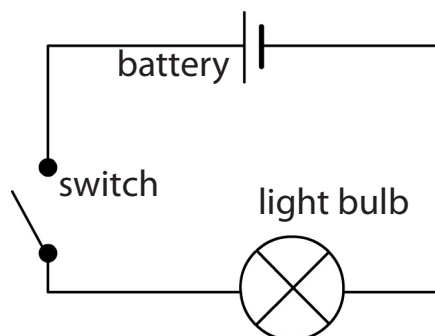
In the space provided, draw your own circuit using symbols from the previous worksheet. Remember to label your symbols.

This is a circuit diagram. This is a simple and quick way to represent an electric circuit. The circuit has a battery, a bulb and a switch, which are all connected with electric wires.



Did you draw straight circuit wires or were they a little curved and bent? \_\_\_\_\_  
Although we draw the wires as straight lines in a circuit diagram, in real life, the wires are not straight.

Your circuit should look like this:



Now draw as many different circuits as you can. Here are some ideas:

A circuit with 1 cell and 2 bulbs

A circuit with 2 cells and 2 bulb

A circuit with 3 cells and 3 bulbs

A circuit with 3 cells, a bulb and an open switch

A circuit with 1 cell and 2 bulbs and a closed switch. The switch must be in between the bulbs.

# Electric circuits (1)

Name: \_\_\_\_\_

## Simple Circuits

### Revision Exercise:

Explain the meaning of electricity: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

What material do we need to make a simple circuit? \_\_\_\_\_

\_\_\_\_\_

What is the difference between a closed and open electrical circuit? \_\_\_\_\_

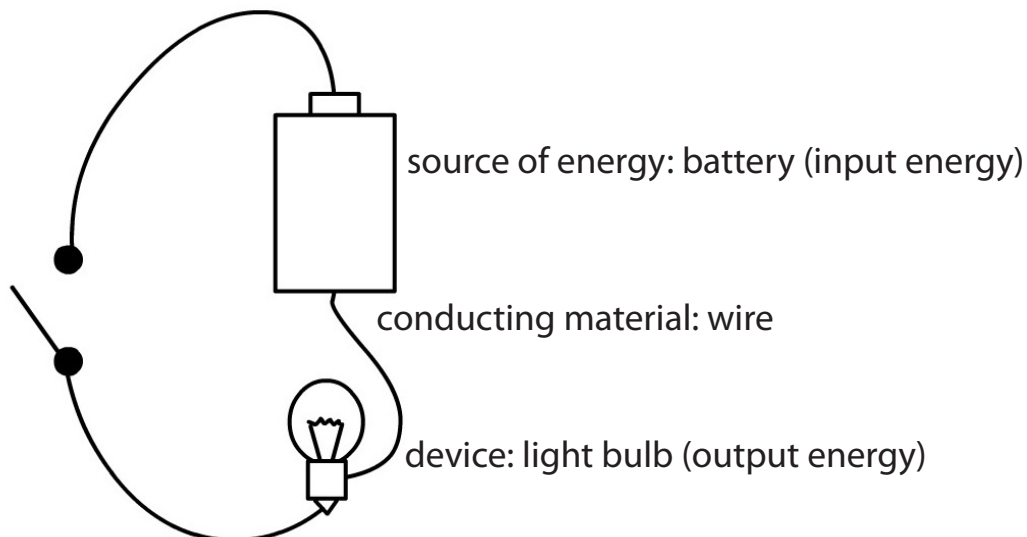
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Research Activity:

Think of the world that we live in today. One of the things that we are in touch with on a daily basis is electricity. Write down at least six uses of electricity in your school.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### FUN ACTIVITY: Making your Own Simple Circuit



# Electric circuits (2)

## Instructions:

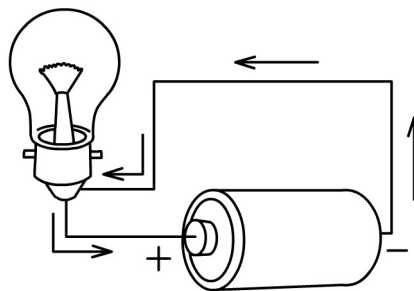
Connect the battery to the bulb using one wire in four different ways. You can place the bulb on top of, below and next to the battery.

## Record your findings:

- Draw a picture of how you connected the light bulb

- Did the light bulb light up? Answer yes or no: \_\_\_\_\_
- If your answer is "no", why do you think it didn't light up? \_\_\_\_\_

In conclusion, when the light bulb lit up, you constructed a simple electrical circuit. A circuit is a complete, unbroken pathway for electricity to move along (transfer) from the source, which in this case is the battery (input energy) to the device, the light bulb (output energy).



Now try and do the same exercise, using two wires. What did you discover?

## Key learning points:

- Simple circuits consist of three different components (parts of a whole):
  1. A source of electrical energy, such as the battery
  2. Conducting material, along which the electricity is transferred such as the electric wires
  3. A device that transfers the energy for a useful purpose, such as the bulb that provides light

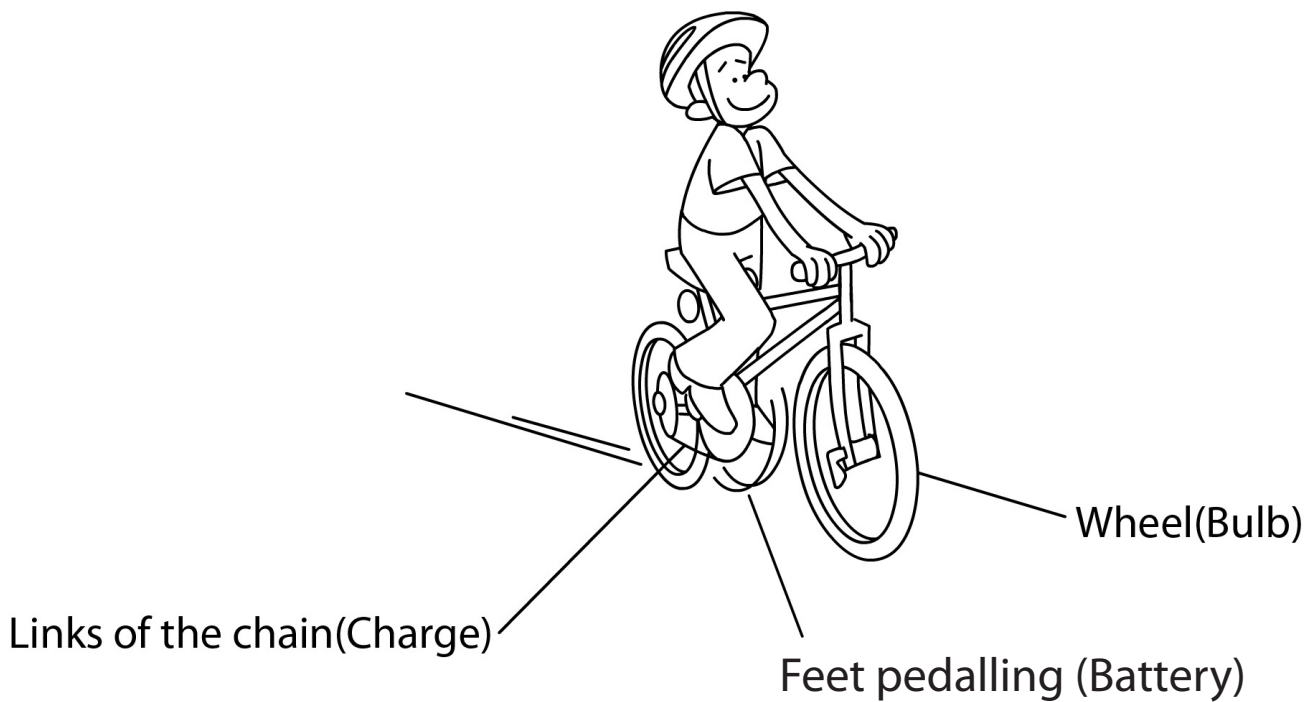
# Electric circuits (3)

## Electrical Current

Electricity is transferred from the source (battery) to the device (light bulb). Another way of saying this is that the electricity “flows” from the source to the bulb to make it light up. This is called an “electrical current”.

The charge is already in the wires (carried by billions of tiny particles called electrons). This charge is evenly spread out through the wires. When the bulb does not light up, we have not made a proper or complete pathway for the electricity to flow and so the electrical current is broken or incomplete.

It’s like a bicycle chain. The links are like the charge, the wheel is like the bulb and your feet are like the battery. As soon as you start pedalling, the back wheel starts to move. This is because turning the pedals makes all the links move at once. It’s not just the links nearest your feet that move.



### KEY WORDS

component

electrical current

flow

## The Electrical Switch

We know that there is a flow of electrical current through the circuit which lights up the bulb. When that current is broken, the flow of electrical charge to the bulb is broken, thus resulting in the bulb not lighting up.

We can deliberately cut off the electrical current to a device, using a switch. A switch is used to turn an electrical circuit on and off.

Fill in the missing words:

The switch is used to \_\_\_\_\_ or \_\_\_\_\_ an electrical circuit. When the

# Electric circuits (4)

switch is on, the circuit is \_\_\_\_\_ and when the switch is \_\_\_\_\_ the circuit is open. Electrical current exists in the circuit when it is closed, but when it is open, there is no \_\_\_\_\_ current in the circuit. The switch determines whether the circuit is open or closed.

## **FUN ACTIVITY: Create a Simple Electrical Circuit with a Switch**

### **Materials you need:**

- A bulb
- 1 x battery (1.5v)
- card
- staples (x2)
- paper clip
- sticky tape
- wire

### **Method:**

- Punch the staples through the card about 2 cm apart
- Tape the wire to the plus end (+) of the battery and the other to the minus (-) end
- Attach the wire taped to the (-) end of the battery to the bottom of the bulb
- Connect the wire taped to the + end of the battery to one of the staples
- Use the third wire to join the second staple to the side of the bulb
- Use the paperclip to touch both staples

### **You will notice that:**

When you turn the paper clip so that it touches both staples, the circuit is open and the bulb lights up. If you move the paper clip away from one of the staples, the circuit is broken (closed) and the light goes out.

### **Write your own conclusion in the space below:**

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