

# S3 Physics *Electric Charge*

Electric current is the flow of **electrons** around the wires of an electric circuit.

There are billions and billions of electrons moving around the wires.

There is so much electrons that in order to count the electricity that flows we have to group them into groups called **coulombs**.

To understand electricity better it is good to think of a ski lift.

In a ski resort skiers are lifted up to the top of the mountain. In other words they are given potential energy.

At the top of the mountain they get off their seats and slide down the mountain.

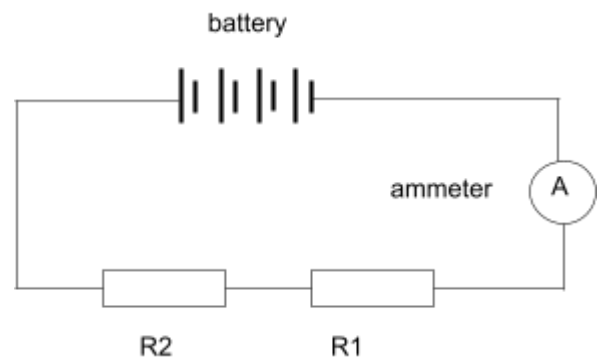
They give up their potential energy into moving energy, called kinetic energy.

It is not all a smooth ski down. There are slushy bits where the skiers experience friction and have to push their way past the slushy bits losing speed, ie, kinetic energy.

It is on these parts that they lose energy.

Finally at the bottom they arrive back at the lift to be taken back up to the top again.

They have been given more potential energy.



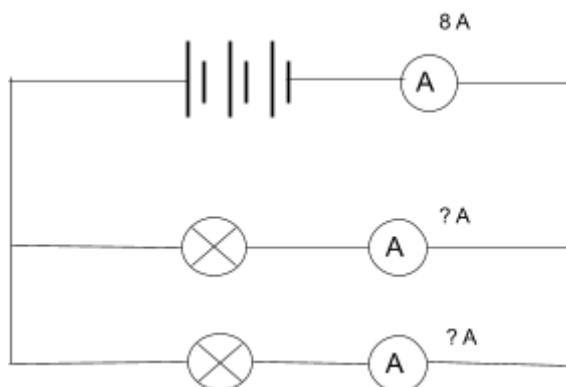
The electric circuit shown is almost identical to ski lift and ski run. See if you can match up the similarities:

- The ski lift is like the \_\_\_\_\_
- The ski run is like the \_\_\_\_\_
- The slushy bits of the ski run is like the \_\_\_\_\_
- What do you think the ammeter could represent?  
Imagine standing on the ski run and counting how many skiers passed in a given time.

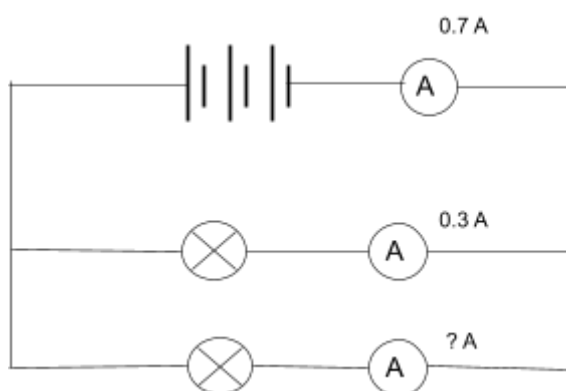
1 Find the electric current when 60 coulombs pass a point in the wire in 10 seconds.	2 Find the electric current when 90 coulombs pass by in 45 seconds	3 Find the electric current when 1000 coulombs pass by in 20 seconds.
4 Find how many coulombs of electric charge pass a point in a wire in 10 seconds when there is a current of 8 amperes in the circuit.	5 Find how many coulombs of electric charge pass a point in a wire in 12 seconds when there is a current of 9 amperes in the circuit.	6 Find out how many coulombs of electric charge pass by a point in a wire in 2.5 seconds when there is an electric current of 10 amperes in the circuit

7. State what is meant by an electric current
  
8. Why do we group the electrons that flow in an electric circuit into quantities called coulombs?
  
9. Which component of an electric circuit gives each electron energy?
  
10. Which component of an electric circuit soaks up the electron's energy?

11. In the circuit shown below each lamp is identical, state how much electric current passes through each lamp.



12. In the circuit shown below the lamps are different. State the reading on the bottom ammeter.



- a. If the bottom lamp is on for 12 seconds how many coulombs of electric charge pass through it?
- b. How many coulombs of charge leave the battery during this time of 12 seconds?