

Unit 7

ELECTRICITY



Wow! Those colourful flashing lights are so beautiful.

Father, how does the carousel move?

Electricity enables the bulbs to light up and the carousel to move.

What will the situation at this funfair be if there is no electricity?



Identifying the Electrical Components

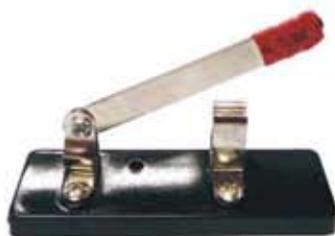
We can build an electric circuit by using these electrical components.



dry cell



bulb



switch



dry cell holder

The dry cell should be installed in a dry cell holder and connected to the correct terminals.

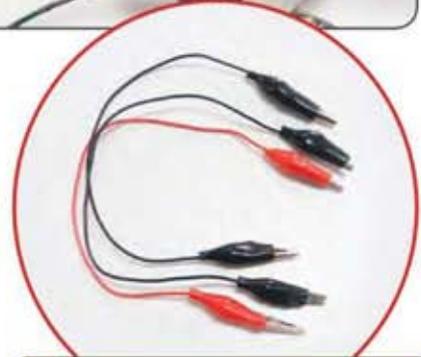


The bulb should be fastened onto the bulb holder correctly.

The wire should be connected to every component correctly.

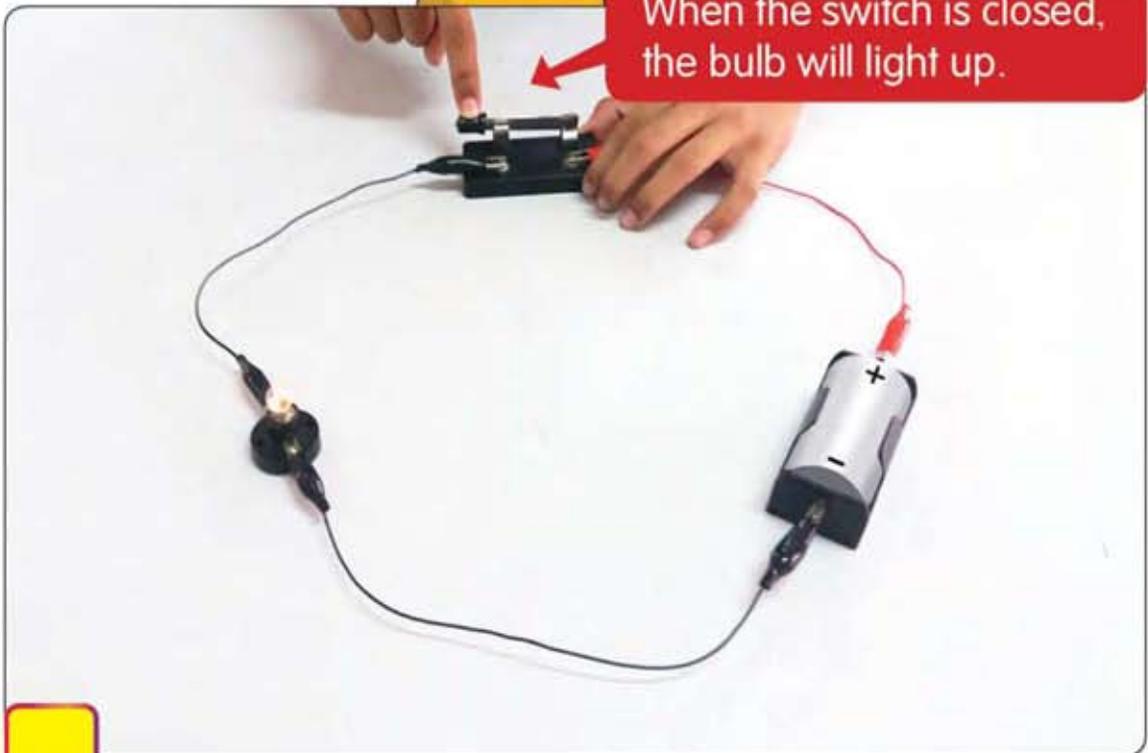


Wire is used to connect each electrical component into a complete circuit.



connecting wires

When the switch is closed, the bulb will light up.





Functions of the Electrical Components

Electrical components have their own functions. Let's see what their functions are.

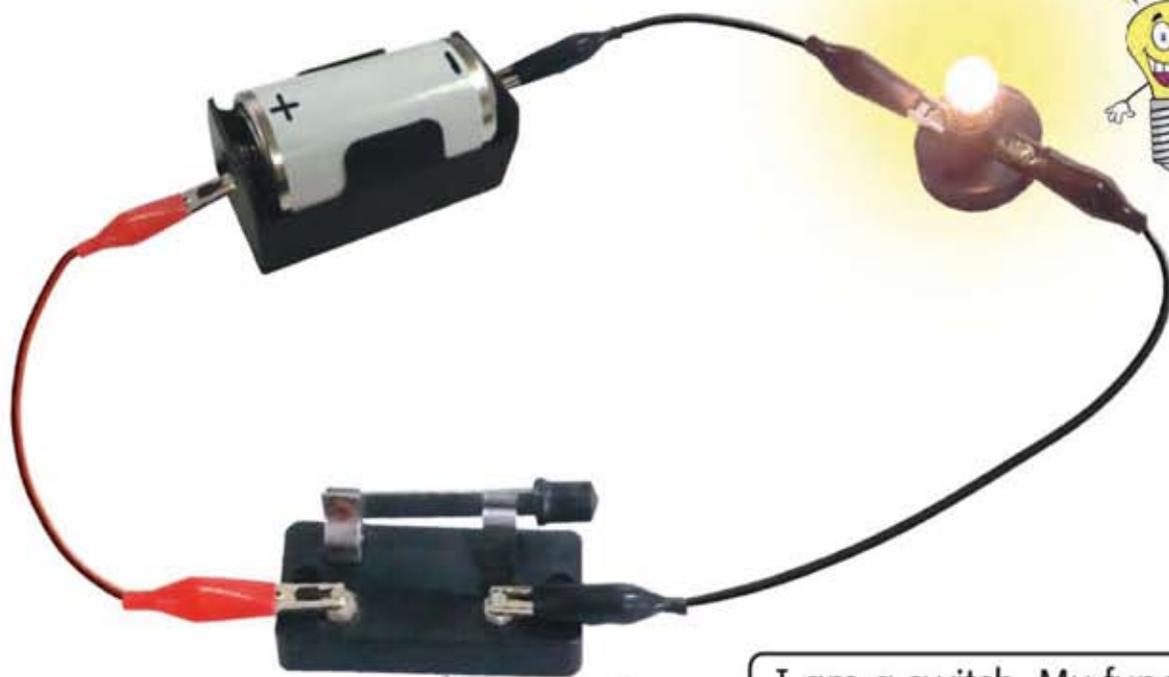
I am a dry cell. My function is to supply electrical energy.



Caution

Bulbs are easily broken because they are made of glass.

I am a bulb. My function is to produce light.



I am a switch. My function is to complete and break an electric circuit.

Teacher's Notes

- The bulb can be replaced with a buzzer using a suitable dry cell. The function of a buzzer is to produce sound.

Activity Book

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7.1.2





Building an Electric Circuit

We can build a simple electric circuit by using electrical components and connecting wires.



I Investigate >> Junior Engineer

Apparatus and Materials

- bulb and bulb holder
- dry cell and dry cell holder
- connecting wires
- switch

Paired Activity

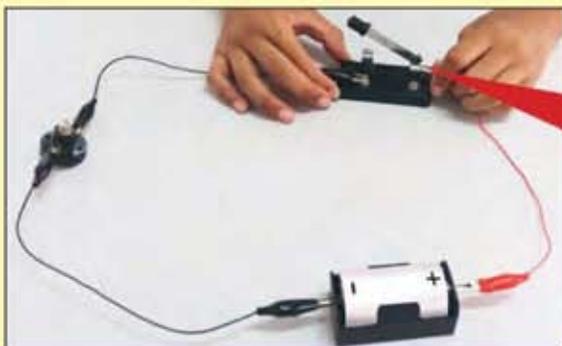
Steps



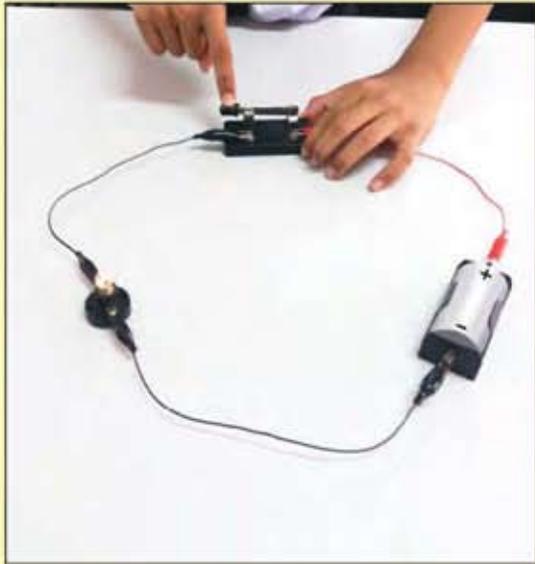
1. Fasten the bulb onto a bulb holder.



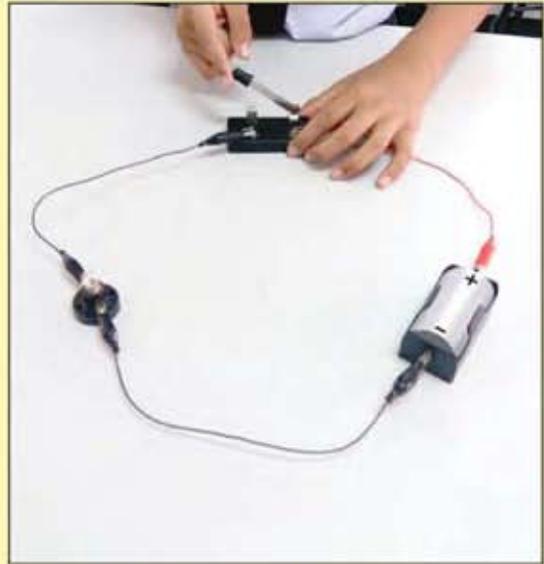
2. Install the dry cell in a dry cell holder.



3. Complete the circuit by connecting all components using the connecting wires.



4. Close the switch and observe the bulb.



5. Open the switch and observe the bulb.

Questions

1. Why does the bulb light up when the switch is closed?
2. Why doesn't the bulb light up when the switch is opened?
3. The bulb will light up when the switch is . The bulb does not light up when the switch is .



HOTS

What will happen to the brightness of the bulb if the circuit is left complete for one day? Why?



Let's Think

List three electrical components that need to be connected using connecting wires to build a complete electric circuit.

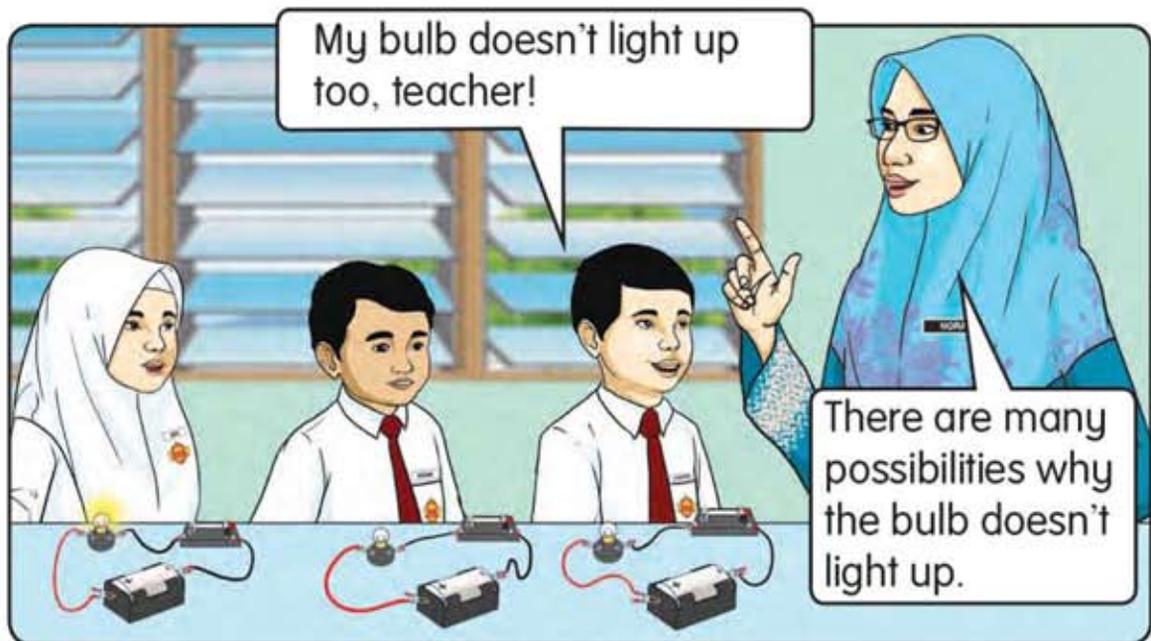
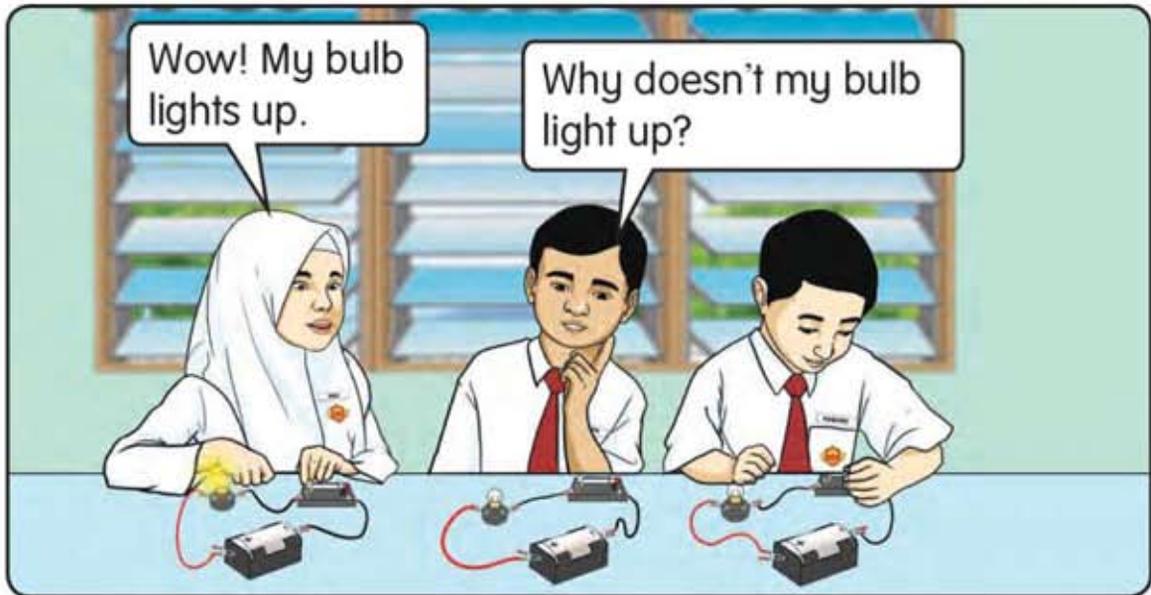
Teacher's Notes

- A closed circuit is a complete circuit.





Why Doesn't the Bulb Light Up?



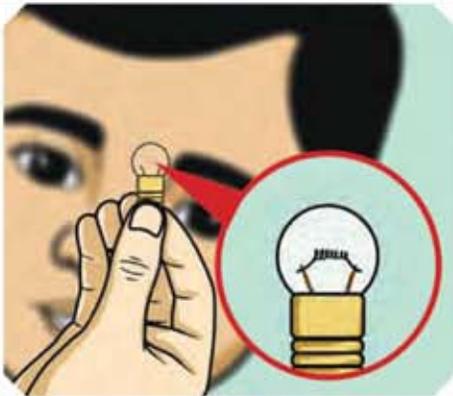
If the bulb does not light up in a complete circuit, the reason could be an opened switch, dry cells which lack of energy or a damaged bulb.

Oh! Perhaps my bulb is damaged.



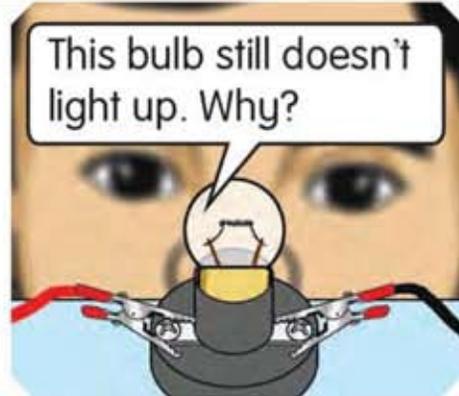
1

Kugan checks the bulb.



2

Kugan changes the bulb but the new bulb does not light up.



3

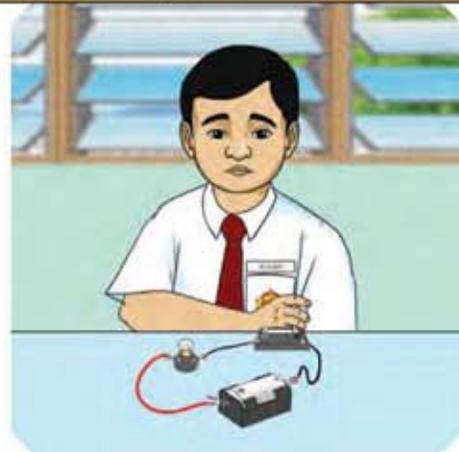
Kugan replaces the dry cell.

Maybe the old dry cell is lack of energy.



4

The bulb still does not light up.



HOTS

Predict why the bulb in Kugan's complete circuit does not light up.





Pupils, the reasons why the bulb doesn't light up could be because the bulb is not properly fastened onto the holder or the wire connections on the electrical components are not connected.



Conductors and Insulators

The bulb will light up when the switch is closed because the electric current flows in a complete circuit.

What happens to the bulb if the switch is replaced with other objects or materials? Let's investigate.



I Investigate >> Replacement Switch

Apparatus and Materials

- bulb
- dry cell
- connecting wires



rubber



paper clip



metal spoon



handkerchief



straw



ice cream sticks



coins



glass rod

7.1.5
7.1.6
7.1.7

Activity Book

Pages:

51-54

Paired Activity

Steps



1. Build a circuit such as the above.
2. Test every object in the circuit.
3. Observe the bulb.
4. Record your observation in the table as shown below.

No.	Object	Bulb lights up/Bulb does not light up	Conductor/Insulator
1	Rubber		
2	Paper clip		
3	Straw		
4	Glass rod		
5	Metal spoon		
6	Ice cream stick		
7	Handkerchief		
8	Coin		

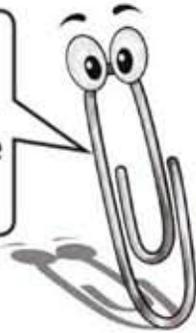
5. List the objects that can light up the bulb.



Questions

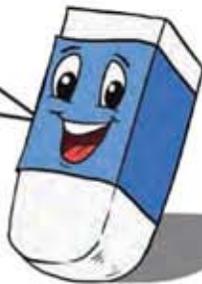
1. List the objects that can replace the switch to light up the bulb.
2. List the objects that cannot replace the switch to light up the bulb.

I'm a paper clip. I allow electric current to flow through me because I'm a conductor.



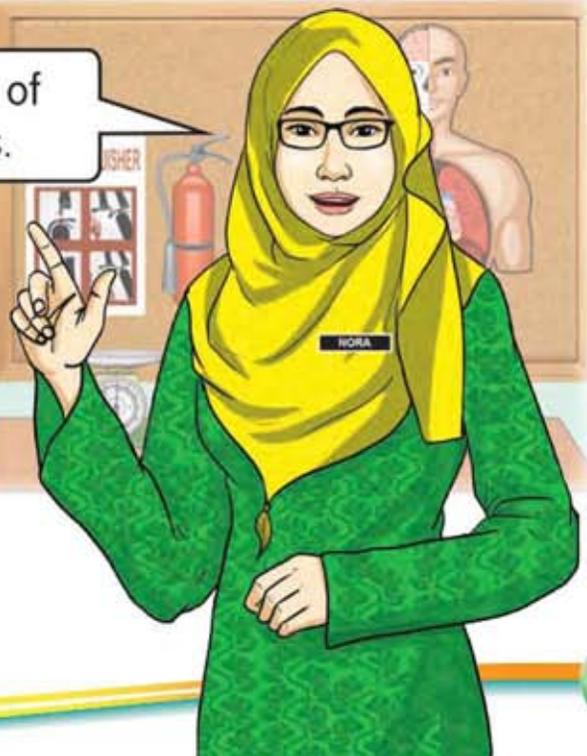
A conductor is a material that allows electric current to flow through it.

I'm a rubber. I don't allow electric current to flow through me because I'm an insulator.



An insulator is a material that does not allow electric current to flow through it.

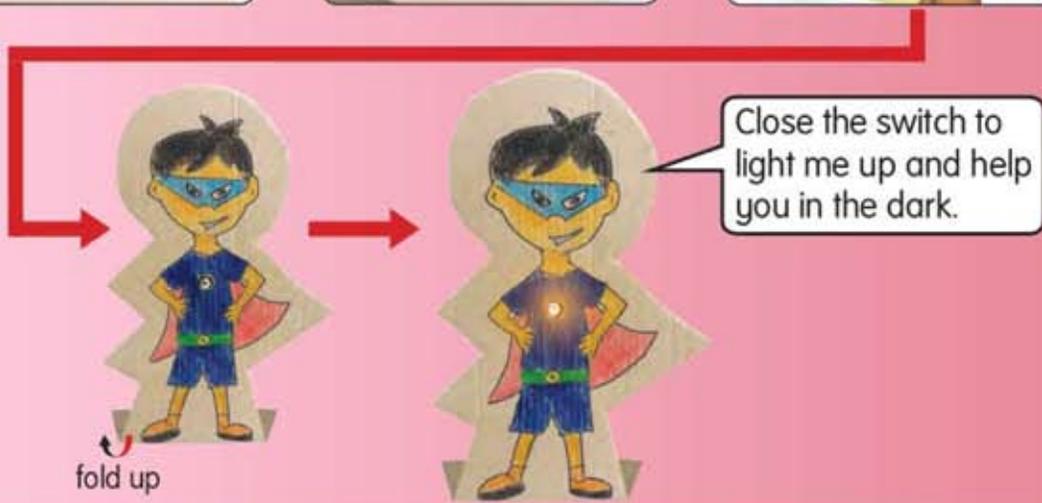
State two other examples of conductors and insulators.





My Superhero

Create a superhero using electrical components and recycled materials such as a paper box.



I Remember

1. Electrical components.



dry cell



bulb



switch

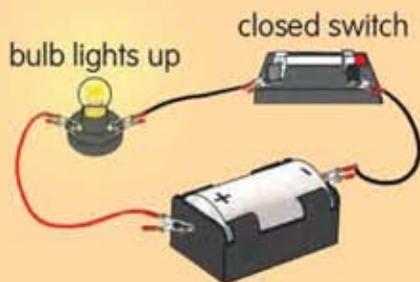
2. Functions of the electrical components:

- dry cell – to supply electrical energy
- bulb – to produce light
- switch – to complete and break the electric circuit

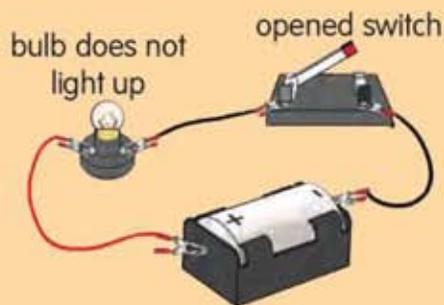


3. A bulb, a switch, a dry cell, and connecting wires are used to form a complete circuit.

4. Complete and incomplete circuits.



complete circuit



incomplete circuit

- The switch is closed.

- The switch is opened.

5. The bulb does not light up because:

- the bulb is damaged
- the dry cell is out of energy
- the bulb is not fastened properly onto the bulb holder
- the wire is not connected correctly to the electrical components
- the switch is opened

6. A conductor is an object that allows electrical current to flow through it. Examples of conductors are a metal spoon, nails, and coins.

7. An insulator is an object that does not allow electrical current to flow through it. Examples of insulators are cloth, rubber, and plastic.



I Answer

Answer all the questions below in your Science exercise book.

1.



dry cell



bulb

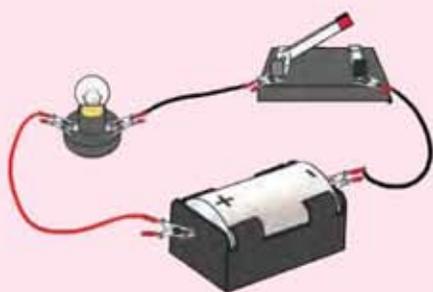


switch

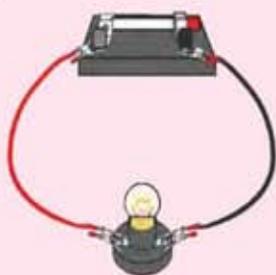
- a) Which component supplies electrical energy?
- b) What is the function of the switch?



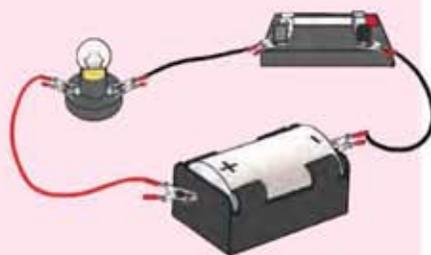
2. Observe the circuits below.



Circuit A



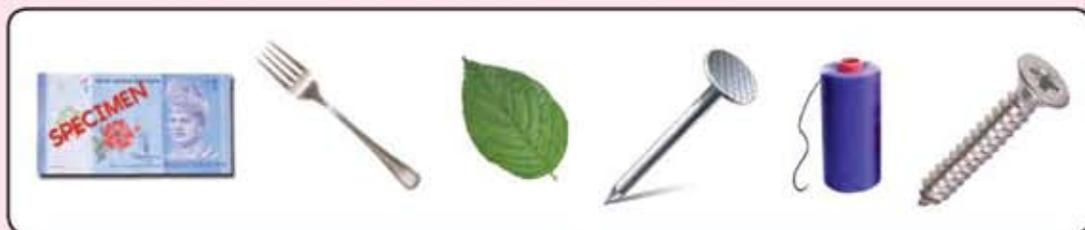
Circuit B



Circuit C

- Which bulb lights up? Why?
- Which bulb does not light up? Why?

3. Classify these objects and complete the table.



Electrical conductors	Electrical insulators
✎	✎
✎	✎
✎	✎

- An electrical conductor is _____ ✎.
 - Examples of electrical conductors are _____ ✎, _____ ✎, and _____ ✎.
- An electrical insulator is _____ ✎.
 - Examples of electrical insulators are _____ ✎, _____ ✎, and _____ ✎.

