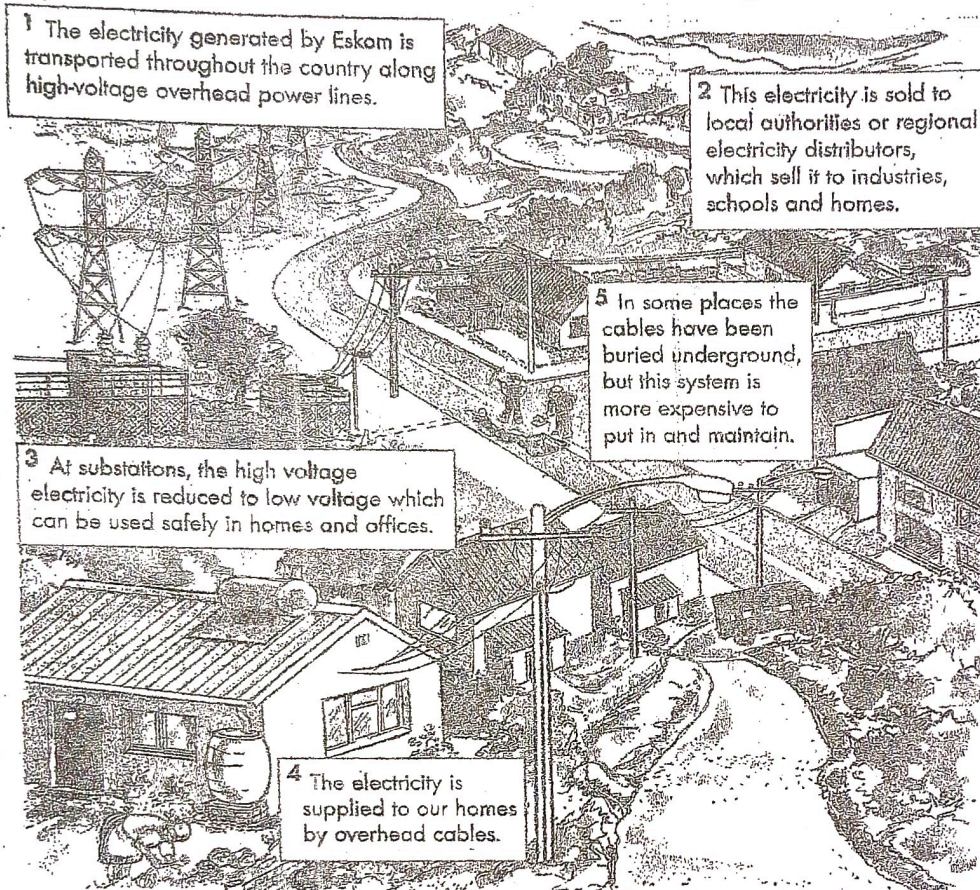


Energy and development in SA

Large-scale electricity supply

Electricity is vital to all of us. We use electricity in our homes, in hospitals, and in industry. Most of the electricity used in South Africa is produced by Eskom, who supplies electricity to the country through the national power grid. The diagram below illustrates how Eskom delivers electricity to homes and industries throughout the country.



Read the passage and answer the questions!

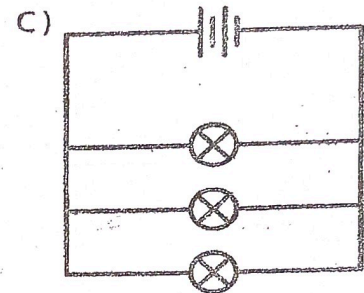
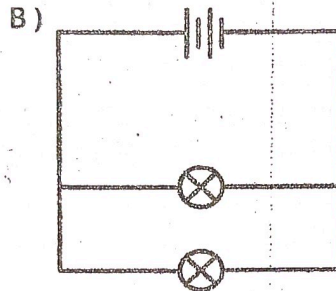
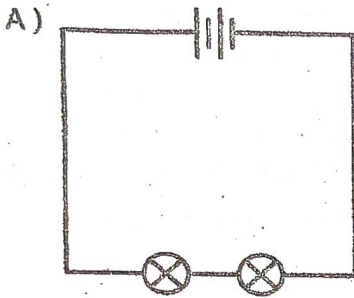
Questions:

1. Name South Africa's supplier of electricity **Eskom**
- 2 a) Name 2 ways in which electricity is transported
High voltage overhead cables
- b) Which is the more expensive method?
- c) How is the electricity in our homes transported?
3. Is the electricity supplied free of charge?
4. Why is a high-voltage electricity reduced to a low-voltage electricity before it is supplied?

EXERCISE 1

- Define each of the following terms:
 - electric current
 - series circuit
 - parallel circuit
 - resistor
- What is the difference between a conductor and an insulator?

- Look at these circuits.



- In which circuit will the light bulbs be the brightest? (2)
 - In which circuit will the light bulbs be the dimmest? (2)
- In Circuit 1, two bulbs are connected in series using nichrome wire as the conductor. In Circuit 2, two identical bulbs are connected in series using copper wire as the conductor. In which circuit will the bulbs be the brightest? Explain your answer. (4)
 - Name each of these symbols that are used in circuit diagrams. (3)
 -
 -
 -
 - Draw the following circuit diagrams. (2)
 - An electrical circuit with two cells connected in parallel, and two cells in series (2)
 - An electrical circuit with four cells and a switch connected in series, and three light bulbs connected in parallel. (2)

EXERCISE 2

- List four basic components of an electric circuit. (4)
- Draw the circuit diagram of an electronic game that uses three cells to give light and sound. (4)
- Your electric kettle is not working and you have discovered that the problem is with the light that indicates when the kettle is on. Draw a circuit diagram to show how you can create a short circuit to keep the kettle working. (5)
- Explain what an electromagnet is. (2)

EXERCISE 3

Match the terms in Column A with the explanations in Column B.

Column A	Column B
1. Electric current	An electrical circuit that allows current to flow in an unintended circuit
2. Electrolysis	Process by which ionic substances are broken down into simpler substances when an electric current is passed through an ionic solution
3. Short circuit	The regions of force surrounding a permanent magnet or a moving charged particle
4. Fuse	Device used to protect the components in a circuit
5. Resistor	Device that opposes the flow of current
6. Magnetic field	The electrode where current flows out
7. Anode	The electrode where current flows in from the outside
8. Cathode	Solution that contains positively and negatively charged particles
9. Electrons	Negatively charged particles
10. Ionic solution	The flow of charge

EXERCISE 4

1. Study the circuit diagrams in Figure 8.32 and answer the questions that follow:

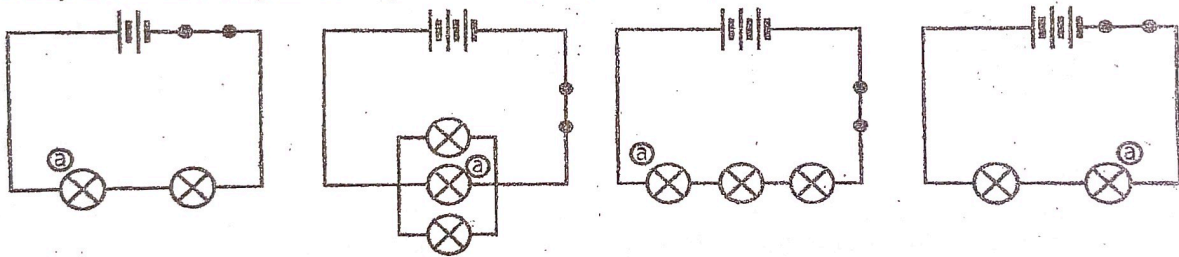


Figure 8.32: Note that the lightbulbs are identical.

- a) Which lamp will burn the brightest? Give reasons for your answer.
- b) Use Figure 8.32 to draw the symbol for a cell, a closed switch and a light bulb.
2. Draw a circuit diagram with the following components: two cells in series, two bulbs in series, an open switch and a resistor.
3. What are the effects of a current? Include an example of how each of these can be of use to us.
4. What is a short circuit and how can it be prevented?
5. What is a resistor? Give two uses of resistors in everyday life.
6. Write down the correct term for the following explanations:
 - a) An electromagnet that is made from wires carrying an electric current
 - b) A device in a circuit with a metal strip that melts if the current is too high
 - c) Part of a circuit that slows down the flow of electricity
 - d) The process of breaking down a substance using an electrical current