

AMATHOLE EAST DISTRICT

GRADE 6
NATURAL SCIENCES AND TECHNOLOGY
TERM 3 FAT
2024

Name: _____

Class: _____ Date: _____

School: _____ Teacher: _____

FAT	Activity / Form	Learner's mark	Learner's %
5	Common Practical/ Investigation Task		
TOTAL		30	

PART 1: ELECTRICITY

INSTRUCTIONS:

Build the electric circuits as instructed by using the apparatus in the Science Kit. Complete the questions and activity by applying the steps and recording the result.

AIM:

To investigate the effect of more cells and more bulbs connected in series in an electric circuit.

HYPOTHESIS

More cells in series provides more power/voltage to an electric circuit to power bulbs to shine at their brightest and More bulbs increase resistance which makes bulbs shine at their lowest.

PLEASE RECORD YOUR OBSERVATIONS BY ANSWERING THE QUESTIONS

APPARATUS NEEDED:

- Batteries/ Cells in battery holders
- Connecting wires with crocodile clips
- Light bulbs
- Wooden plank
- Drawing pins
- Large metal paper clip (no plastic coating)

1 – INSTRUCTIONS TO BE EXECUTED: (One Cell, One Bulb)

Connect one cell to a single bulb with connecting wires.

Press two drawing pins into the wooden plank some distance apart and connect the paper clip onto both drawing pins.

Make the switch you have made part of your circuit diagram.

1. Which type of switch have you made: (Open or Closed) _____ (1)
2. What is happening in the electric circuit to show your switch is working? (1)

2 – INSTRUCTIONS TO BE EXECUTED: (Two Cells and One Bulb)

Connect another cell in series in the electric circuit and close the switch.

3. Compare the brightness of the bulb to the electrical circuit which only had one cell. How does the light bulb shine? (Describe the brightness of the bulb)

_____ (1)

3 – INSTRUCTIONS TO BE EXECUTED: (One Cell and Two Bulbs)

Remove one cell and connect a second bulb next to the existing one.

4. How are the bulbs connected? _____ (1)
5. Compare the brightness of the bulbs to the previous electric circuit that had one cell and one bulb and record your results.

_____ (2)

4 – INSTRUCTIONS TO BE EXECUTED: (Two Cells and Two Bulbs)

Connect another cell in series and connect a second bulb next to the existing one.

6. Compare the brightness of the bulbs to the previous electric circuit that had one cell and two bulb and record your results.

_____ (1)

7. Compare all the electric circuits you built. Which electric circuit had the brightest bulb(s) _____ (1)

8. Compare all the electric circuits you built. Which electric circuit had the dimmest bulb(s) _____ (1)

CONCLUSION

9. Explain why the electric circuit with **ONE** bulb and **TWO** cells shone the brightest out of all the electric circuits. (2)

10. The above INVESTIGATION indicates that more cells connected in an electric circuit provides more _____ (1)

11. Explain why the electric circuit with **TWO** bulb and **ONE** cells shone the dimmest out of all the electric circuits. (2)

12. The above INVESTIGATION indicates that more bulbs connected in an electric circuit provides more _____ (1)

[15 Marks]

PART 2: ELECTRICAL CONDUCTORS AND INSULATORS

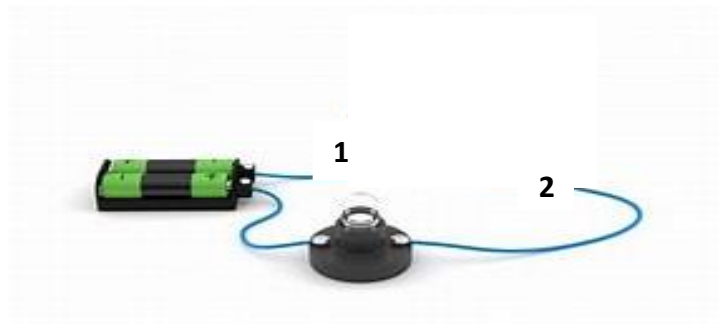
INVESTIGATION: What kind of materials can we use in electric circuits?

1. Write down an aim for this investigation. (1)

MATERIAL AND APPARATUS:

- D-size battery (1,5 V)
- torch light bulb
- three pieces of electric wire (15cm to 25cm long) with the ends stripped of the plastic insulating material
- adhesive tape or Prestik
- various objects made of different materials like:
 - metal paper clip (remove the plastic if covered)
 - paper clip covered with plastic
 - rubber band
 - nail
 - glass object (rod, tube or just a piece of glass)
 - pen
 - coins (brass and silver)
 - cardboard
 - paper (fold the paper to form at least double layers to make it easier to connect in a circuit)

- steel wool
- piece of wood
- pencil (contact points on the wood)
- pencil with both sides sharpened to expose the lead, test the lead part of the pencil
- rubber
- chalk
- piece of ceramic
- aluminium foil
- metal spoon
- plastic spoon
- piece of leather
- drinking straw
- Styrofoam



METHOD: Use three electrical wires to set up the electric circuit as shown above.

Note that the ends of two of the wires are not touching.

Test that the circuit is connected properly by touching 1 and 2 to each other and making sure that the bulb lights up

Take the first one of the objects in the list above.

Put the object between the two wire ends at 1 and 2.

Make sure there is good contact between the object and the wire ends.

Test each object as instructed and record your observations in the table below.

OBSERVATIONS AND RECORDING OF RESULTS:

BULB LIGHTS UP	BULB DOES NOT LIGHT UP

(10 Marks for the correct recording of results)

2. What do the objects that lit up the bulb have in common? (1)

3. What do all the objects that did not light up the bulb have in common?

4. CONCLUSION:

Write a conclusion for this investigation below. (2)

[15 Marks]

MARKING GUIDE

PART 1: ELECTRICITY

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HYPOTHESIS

More cells in series provides more power/voltage to an electric circuit to power bulbs to shine at their brightest and More bulbs increase resistance which makes bulbs shine at their lowest.

PLEASE RECORD YOUR OBSERVATIONS BY ANSWERING THE QUESTIONS

APPARATUS NEEDED:

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- Light bulbs
- Wooden plank
- Drawing pins
- Large metal paper clip (no plastic coating)

1 – INSTRUCTIONS TO BE EXECUTED: (One Cell, One Bulb)

**Connect one cell to a single bulb with connecting wires.
Press two drawing pins into the wooden plank some distance apart and connect the paper clip onto both drawing pins.
Make the switch you have made part of your circuit diagram.**

13. Which type of switch have you made: (Open or Closed) Closed (1)

14. What is happening in the electric circuit to show your switch is working? (1)

The bulb is glowing/ Shining

2 – INSTRUCTIONS TO BE EXECUTED: (Two Cells and One Bulb)

Connect another cell in series in the electric circuit and close the switch.

15. Compare the brightness of the bulb to the electrical circuit which only had one cell. How does the light bulb shine? (Describe the brightness of the bulb) (1)

The bulb is glowing/ shining brighter than the first one

3 – INSTRUCTIONS TO BE EXECUTED: (One Cell and Two Bulbs)

Remove one cell and connect a second bulb next to the existing one.

16. How are the bulbs connected? Bulbs are connected in series (1)
17. Compare the brightness of the bulbs to the previous electric circuit that had one cell and one bulb and record your result. (2)

The bulbs shine dimmer

4 – INSTRUCTIONS TO BE EXECUTED: (Two Cells and Two Bulbs)

Connect another cell in series and connect a second bulb next to the existing one.

18. Compare the brightness of the bulbs to the previous electric circuit that had one cell and two bulb and record your results. (1)

The bulbs will glow brighter

19. Compare all the electric circuits you built. Which electric circuit had the brightest bulb(s) The circuit with one bulb and two cells (1)
20. Compare all the electric circuits you built. Which electric circuit had the dimmest bulb(s) The circuit with one cell and two bulbs (1)

CONCLUSION

21. Explain why the electric circuit with **ONE** bulb and **TWO** cells shone the brightest out of all the electric circuits. (2)

The electric circuit with one bulb and two cells has the most energy that

flows in the circuit through the components

22. The above INVESTIGATION indicates that more cells connected in an electric circuit provides more Energy (1)

23. Explain why the electric circuit with **TWO** bulb and **ONE** cells shone the dimmest out of all the electric circuits. (2)

Less energy flows in the circuit and the resistance is increased

24. The above INVESTIGATION indicates that more bulbs connected in an electric circuit provides more Resistance (1)

[15 Marks]

PART 2: ELECTRICAL CONDUCTORS AND INSULATORS

INVESTIGATION: What kind of materials can we use in electric circuits?

5. Write down an aim for this investigation. (1)

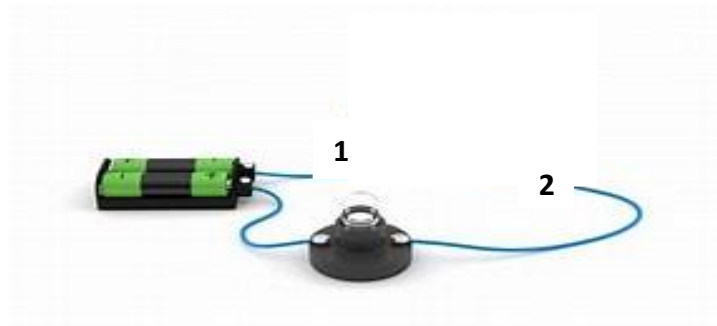
To investigate which kind of materials conduct electricity and

which kind of materials do not conduct electricity.

MATERIAL AND APPARATUS:

- D-size battery (1,5 V)
- torch light bulb
- three pieces of electric wire (15cm to 25cm long) with the ends stripped of the plastic insulating material
- adhesive tape or Prestik
- various objects made of different materials like:
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ends.

Test each object as instructed and record your observations in the table below.

OBSERVATIONS AND RECORDING OF RESULTS:

BULB LIGHTS UP	BULB DOES NOT LIGHT UP

(10 Marks for the correct recording of results)

6. What do the objects that lit up the bulb have in common? (1)

All are made of metallic materials

7. What do all the objects that did not light up the bulb have in common? (1)

They are all made from non-metals

8. CONCLUSION:

Write a conclusion for this investigation below. (2)

All metals conduct electricity and non-metals do not conduct electricity

[15 Marks]