Practice Paper

CBSE Class 8 Science (Curiosity) — Chapter 4: Electricity: Magnetic and Heating Effects

Time: 1½ hours	**Maximum Marks:** 40	**Session:** 2026–27
Name: _____	Roll No.: _____	Date: _____

General Instructions: (1) All questions are compulsory. (2) Questions marked **[Fig. N]** are figure-based (Fig. 1 to Fig. 7); study the figure carefully. (3) Write answers in the answer sheet; draw neat labelled diagrams wherever needed. (4) Marks for each question are shown in square brackets.

SECTION A — Multiple Choice Questions (1 mark each)

1. In 1820, a scientist noticed that the needle of a magnetic compass kept near a wire deflected whenever the circuit was closed or opened. This showed that electricity and magnetism are linked. The scientist was **[1]**

(a) Alessandro Volta

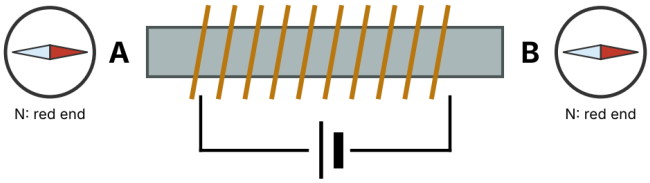
(b) Luigi Galvani

(c) Hans Christian Oersted

(d) Thomas Edison

2. [Fig. 1] Fig. 1 shows an electromagnet connected to a cell, with a compass placed near each end. The red end of each needle is its north pole. Which of the following is correct? **[1]**

Fig. 1: Electromagnet with two compasses (current flowing)



(a) End A is a north pole and end B is a north pole.

(b) End A is a south pole and end B is a north pole.

(c) End A is a south pole and end B is a south pole.

(d) End A is a north pole and end B is a south pole.

3. [Fig. 2] Fig. 2 shows three electromagnets, P, Q and R, made with the same coil, and the paper clips each one attracts. What does a comparison of P and Q show? **[1]**

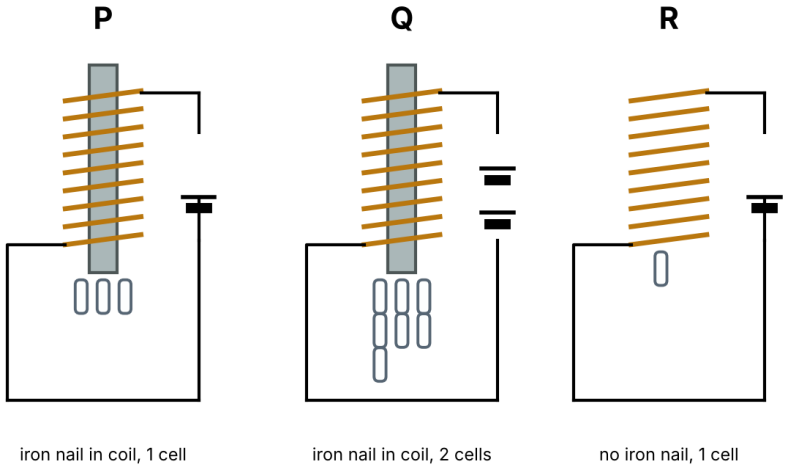


Fig. 2: Three electromagnets (same coil); paper clips attracted

(a) A coil with more turns is a stronger electromagnet.

(b) A battery with more cells makes a stronger electromagnet.

(c) An iron core makes the electromagnet weaker.

(d) The strength depends on the direction of the current.

4. Two wires of the same size and length, one of copper and the other of nichrome, are connected one after the other to the same cell for the same time. Which statement is correct? **[1]**

(a) The copper wire gets hotter because it is a better conductor.

(b) The nichrome wire gets hotter because it offers more resistance to the current.

(c) Both wires get equally hot.

(d) Neither wire gets hot because the cell is small.

5. Which of the following appliances works mainly on the **magnetic** effect of electric current? **[1]**

(a) Electric iron

(b) Water heating immersion rod

(c) Electric kettle

(d) Electric fan

6. Which of the following statements about a dry cell is correct? **[1]**

(a) The zinc container is the positive terminal.

(b) The carbon rod with a metal cap is the positive terminal and the zinc container is the negative terminal.

(c) The electrolyte in it is a free-flowing liquid.

(d) It can be recharged and reused many times.

Questions 7 and 8 consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

7. Assertion (A): The heating element of an electric heater is made of nichrome wire and not of copper wire.
Reason (R): Nichrome offers more resistance to the flow of current than a copper wire of the same size and length. **[1]**

(A) Both A and R are true, and R is the correct explanation of A.

(B) Both A and R are true, and R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

8. Assertion (A): An iron nail wrapped with a coil carrying current is a stronger magnet than the coil alone.
Reason (R): The iron nail is itself a permanent magnet. **[1]**

(A) Both A and R are true, and R is the correct explanation of A.

(B) Both A and R are true, and R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

SECTION B — Short Answer Questions (2 marks each)

9. [Fig. 3] Fig. 3 shows a cell made by joining three lemons in series, each with a copper strip and an iron nail inserted in it. The LED connected to it glows. **[2]**

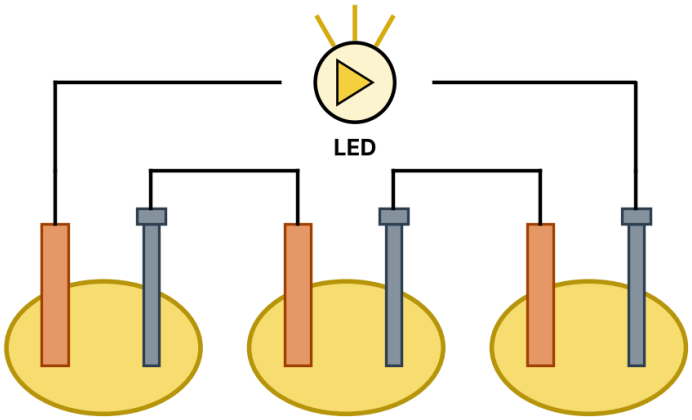


Fig. 3: Cell made using three lemons

(a) Name the electrodes and the electrolyte of this cell.

(b) After several hours, the LED becomes dim and finally stops glowing. Give a reason.

10. [Fig. 4] Fig. 4 shows a circuit in which a nichrome wire is tied between two nails fixed on a cardboard sheet. The switch is in the ON position for 30 seconds. **[2]**

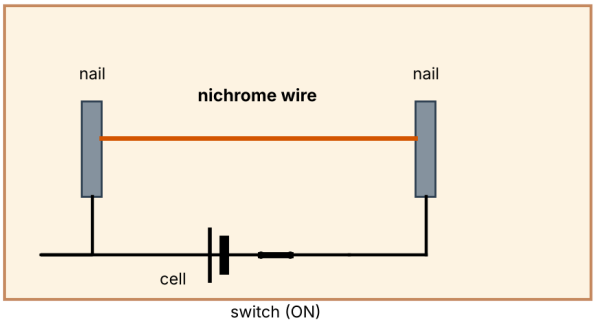


Fig. 4: Circuit with a nichrome wire

(a) Why does the nichrome wire become warm?

(b) The experiment is repeated with a battery of two cells for the same time. Will the wire become warmer or cooler than before? Give a reason.

11. (a) Name the material of the positive terminal and of the negative terminal of a dry cell. (b) Why is it called a ‘dry’ cell? **[2]**

SECTION C — Long Answer Questions (4 marks each)

12. [Fig. 5] Fig. 5 shows a magnetic compass placed below a straight wire. In (a) the switch is OFF; in (b) the switch is ON. **[4]**

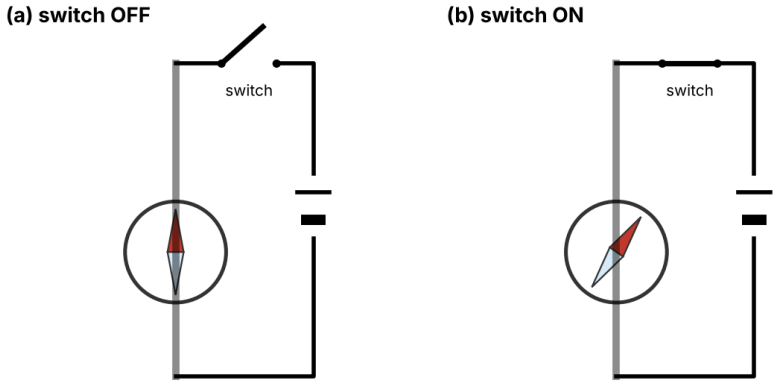


Fig. 5: Compass placed below a wire (wire is parallel to the needle in (a))

(i) What change in the compass needle do you observe in (b) compared with (a)? [1]

(ii) What does this observation show about a wire carrying current? [1]

(iii) Name the scientist who first made this discovery. [1]

(iv) What will the needle do when the switch is turned OFF again? [1]

13. [Fig. 6] Fig. 6 shows a crane fitted with a lifting electromagnet in a scrap yard. In (a) the switch is ON; in (b) the switch is OFF. **[4]**

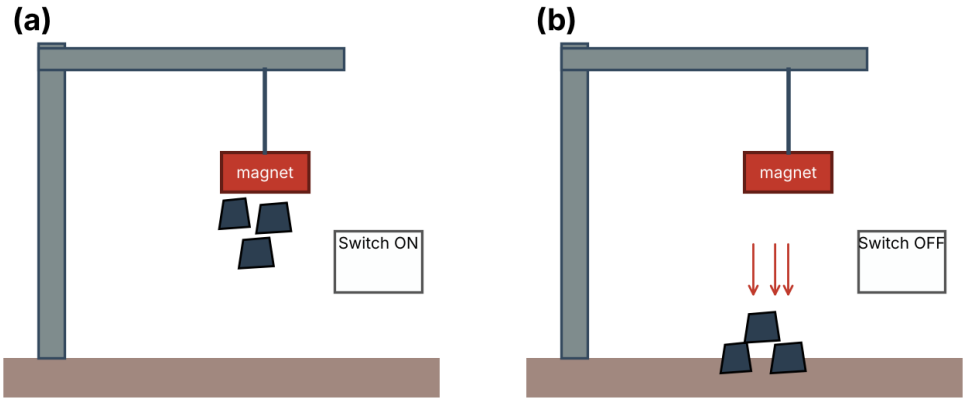


Fig. 6: A crane fitted with a lifting electromagnet, in two situations

(i) Why do the pieces of iron scrap stick to the magnet in (a)? [1]

(ii) Why do the pieces fall down in (b)? [1]

(iii) Why is an electromagnet more useful than a permanent magnet for this work? [1]

(iv) Write two ways of making this electromagnet stronger. [1]

14. (a) What is the heating effect of electric current? [1] (b) Name any two household appliances that work on it. [1] (c) On what factors does the heat produced in a wire depend? (any two) [1] (d) Why can overheating of plugs and sockets be dangerous? [1] **[4]**

15. Answer the following questions about electric cells and batteries. **[4]**

(i) Why is a dry cell called a single-use cell? [1]

(ii) Why are rechargeable batteries preferred in devices such as mobile phones and laptops? [1]

(iii) Why should used batteries not be thrown into the regular garbage? [1]

(iv) Name the most common type of rechargeable battery found in modern devices. [1]

SECTION D — Case-Based / Practical Questions (5 marks each)

16. [Fig. 7] Case: Rhea wound an insulated wire around an iron nail to make electromagnets with 10, 20, 30 and 40 turns. She connected each one to the same cell for a few seconds and counted the paper clips it lifted. Fig. 7 shows her results. **[5]**

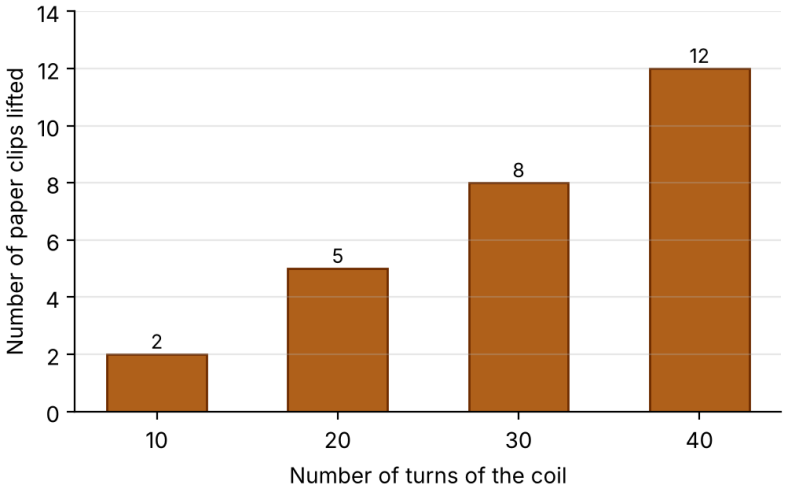


Fig. 7: Clips lifted by electromagnets with different numbers of turns (one cell)

(i) How many clips did the 30-turn electromagnet lift? [1]

(ii) What conclusion can Rhea draw about the number of turns and the strength of the electromagnet? [1]

(iii) Name one other way, apart from the number of turns, to make the electromagnet stronger. [1]

(iv) What will happen to the number of clips lifted if she removes the iron nail from the coil? [1]

(v) Why should the coil not be connected to the cell for more than a few seconds? [1]

17. Case: In a village house, an electric room heater was connected to a thin extension board with an old plug. After half an hour, the plastic of the plug and socket became soft and started to melt, and there was a smell of burning. The electrician advised the family to use wires, plugs and sockets rated for the current of the heater. **[5]**

(i) Name the effect of electric current that makes a room heater hot. [1]

(ii) Why is nichrome used in the heating element of a heater? [1]

(iii) Why did the plastic parts of the plug and socket melt? [1]

(iv) Why did the electrician advise using wires, plugs and sockets rated for the current? [1]

(v) Name two other appliances that work on the same principle as the room heater. [1]

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