

CLASS 8

SCIENCE

NCERT SOLUTIONS

NCERT Solutions for Class 8 Science Chapter 4: Electricity: Magnetic and Heating Effects – Free PDF Download

Chapter 4 — Electricity: Magnetic and Heating Effects — covers the magnetic effect of electric current (discovered by Oersted), how electromagnets are made and used, the heating effect of current, why nichrome is used in heating appliances, and how a simple chemical (Voltaic) cell like a lemon cell generates cur...

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Chapter 4 — Electricity: Magnetic and Heating Effects — covers the magnetic effect of electric current (discovered by Oersted), how electromagnets are made and used, the heating effect of current, why nichrome is used in heating appliances, and how a simple chemical (Voltaic) cell like a lemon cell generates current. This chapter has a full 11-question end-of-chapter exercise ('Keep the Curiosity Alive') plus extensive activity-based in-text questions. Below are complete, verified answers, sourced directly from the official NCERT PDF. These Class 8 Science Chapter 4 solutions are also useful as quick revision notes before exams.

NCERT Solutions for Class 8 Science Chapter 4: Electricity: Magnetic and Heating Effects

Exercise: Keep the Curiosity Alive

1. Fill in the blanks: (i) The solution used in a Voltaic cell is called _____. (ii) A current-carrying coil behaves like a _____.

(i) electrolyte (ii) magnet (electromagnet).

2. True or False: (i) Dry cells are less portable than Voltaic cells. (ii) A coil becomes an electromagnet only when current flows through it. (iii) An electromagnet with 1 cell attracts more clips than the same electromagnet with 2 cells.

(i) **False** (dry cells are more portable). (ii) **True**. (iii) **False** (2 cells give more current, so it attracts more clips).

3. Current flows through a nichrome wire briefly: (i) the wire becomes warm (ii) a compass below is deflected. Which is correct?

Both (i) and (ii) are correct — every current-carrying conductor shows both the heating effect and the magnetic effect at the same time.

4. Match: Voltaic cell / Electric iron / Nichrome wire / Electromagnet — with: works via chemical reactions / heating effect / magnetic effect / best suited for heaters.

Voltaic cell → chemical reactions; Electric iron → heating effect; Nichrome wire → best suited for heaters; Electromagnet → magnetic effect.

5. Why is nichrome commonly used in heating devices?

Because it has **higher resistance** than copper, so it generates more heat for the same current — it is a conductor (not an insulator), so heat generation, not conduction ability alone, is why it's chosen.

6. Why are electric heating devices considered more convenient than burning firewood/charcoal?

Instant on/off control via a switch, no smoke or soot (better indoor air quality), reduces pressure on wood as fuel, saves time and labour, and gives consistent, adjustable heat.

7. A compass near a coil deflects when current flows: (i) show the current's path (ii) why does the needle move (iii) what if the battery terminals are reversed?

(i) Current flows from the cell's positive terminal, through the switch and coil, back to the negative terminal. (ii) The current-carrying coil creates a magnetic field, which acts on the compass needle (itself a small magnet). (iii) Reversing the terminals reverses the current and hence the magnetic field's direction — the needle deflects to the **opposite side**.

8. Sumana forgets to switch off her electromagnet; later it stops lifting clips, but the wire is still warm. Why?

The cell has been supplying current for a long time and has become weak/discharged, so the current has dropped too low to create a strong enough magnetic field to lift clips — but some current is still flowing, which keeps generating heat (the heating effect needs less current than the lifting threshold).

9. An LED is connected via a copper strip and iron nail dipped in (a) lemon juice (b) pure water. Which case makes the LED glow?

Case (a) — lemon juice is an electrolyte (contains ions) that enables a chemical reaction between the two different metal electrodes, generating current; pure water lacks enough ions to conduct meaningfully.

10. Neha removes the iron nail from a coil, leaving only the coiled wire. Will it still deflect a compass? More or less than before?

Yes, it will still deflect the compass, but **less** than with the iron nail inside, since the iron core strengthens and concentrates the magnetic field.

11. Four coils (iron, copper, aluminium, nichrome) all carry current. In how many circuits will a nearby compass deflect?

In all four circuits — the magnetic effect depends only on current flowing, not on which metal conducts it; all four are conductors.

Key In-Text Activities

Activity 4.1: Why does a compass needle deflect when current flows through a nearby wire?

A current-carrying wire produces a magnetic field around it; this field acts on the compass needle (a tiny magnet), deflecting it — the needle returns to normal once current stops.

Activity 4.2/4.3: Can current make a magnet, and does an iron core matter?

Yes — a current-carrying coil (electromagnet) can attract iron paper clips; inserting an iron nail inside the coil greatly increases the deflection/strength, showing the core concentrates the magnetic field. An electromagnet has North and South poles, just like a bar magnet, but its magnetism is temporary and can be reversed by reversing the current.

Think Like a Scientist: Does more current or more coil turns change the electromagnet's strength?

Yes — more cells (more current) and more coil turns both increase deflection and the number of clips lifted, making a stronger electromagnet.

Activity 4.5: Does the nichrome wire get warm when current flows?

Yes — the wire feels warm/hot after current flows briefly; using two cells instead of one makes it heat up more, since heat generated increases with current.

Activity 4.6 (lemon cell): Can we make our own Voltaic cell from everyday materials?

Yes — using lemons (or salt solution) as the electrolyte with copper and iron/zinc electrodes generates enough current to light an LED, if the polarity is correct and enough cells are connected in series.

Why This Chapter Matters

This chapter's two effects — magnetic and heating — underlie everyday devices from electric motors, doorbells and speakers (magnetic effect) to irons, heaters, and toasters (heating effect), and its cell/battery basics carry forward into later electricity chapters.

Class 8 Science Chapter 4 – Notes and Extra Questions

Along with these NCERT Solutions, students can also use the [Class 8 Science Chapter 4 Extra Questions](#) and [Class 8 Science Chapter 4 Revision Notes](#) for quick revision and extra practice.

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