

CLASS 8

SCIENCE

NCERT SOLUTIONS

NCERT Solutions for Class 8 Science Chapter 8: Nature of Matter – Elements, Compounds and Mixtures – Curiosity

Chapter 8 of the Class 8 NCERT Curiosity (Jigyasa) textbook is titled "Nature of Matter: Elements, Compounds and Mixtures". Building on Chapter 7's particle theory of matter, this chapter explains how matter is classified into pure substances (elements and compounds) and mixtures — a foundational chemistry topic f...

Contents

Keep the Curiosity Alive — Full Exercise Solutions

Selected “Probe and Ponder” In-text Questions

Why This Chapter Matters

Class 8 Science Chapter 8 – Notes and Extra Questions

Chapter 8 of the Class 8 NCERT Curiosity (Jigyasa) textbook is titled “**Nature of Matter: Elements, Compounds and Mixtures**”. Building on Chapter 7’s particle theory of matter, this chapter explains how matter is classified into pure substances (elements and compounds) and mixtures — a foundational chemistry topic for later classes. These Class 8 Science Chapter 8 solutions are also useful as quick revision notes before exams.

This chapter has a formal 12-question end-of-chapter section called “Keep the Curiosity Alive”, plus several in-text “Probe and Ponder” questions. Original, independently verified solutions to all of them are below.

Keep the Curiosity Alive — Full Exercise Solutions

Q1. $A + B \rightarrow C$, where A and B cannot be broken down further by chemical means. Classify A, B and C.

Solution: A and B are **elements** (they cannot be split into simpler substances by chemical means). C is a **compound**, formed with a fixed composition (law of definite proportions).

Q2. Assertion (A): Air is a mixture. Reason (R): A mixture forms when substances combine without any chemical change.

Solution: Air’s components (nitrogen, oxygen, carbon dioxide, water vapour) keep their own individual properties and can be separated by purely physical means (e.g. fractional distillation of liquid air). **Both A and R are true, and R correctly explains A.**

Q3. Why does water have completely different properties from hydrogen and oxygen?

Solution: Hydrogen gas is highly flammable and oxygen gas supports combustion, yet water actually extinguishes fire. This happens because hydrogen and oxygen atoms combine chemically in a fixed ratio to form water, an entirely new compound with its own distinct properties — unlike a simple mixture, a compound does not retain the properties of its starting elements.

Q4. Which set correctly groups examples as “pure substances”?

Solution: Carbon dioxide, iron, oxygen and sugar are all **pure substances** — CO_2 and sugar are compounds, iron and oxygen are elements, and all four have a fixed composition throughout, unlike a mixture.

Q5. Iron reacts with moist air to form rust; magnesium reacts with oxygen to form magnesium oxide. Classify every substance mentioned.

Solution: Iron and magnesium: **elements**. Moist air: **mixture** (oxygen + water vapour + nitrogen etc.). Rust and magnesium oxide: **compounds**.

Q6. Classify the following into elements, compounds and mixtures: aluminium, gold, oxygen, nitrogen, sulphur, hydrogen, carbon dioxide, magnesium oxide, rust, iron sulphide, glucose, water, sodium chloride, baking soda, sand, seawater, muddy water, air, fruit juice.

Solution:

Elements: aluminium, gold, oxygen, nitrogen, sulphur, hydrogen.

Compounds: carbon dioxide, magnesium oxide, rust, iron sulphide, glucose, water, sodium chloride, baking soda.

Mixtures: sand, seawater, muddy water, air, fruit juice.

Q7. What forms when iron filings and sulphur powder are heated together, and how is it different from the original mixture?

Solution: Heating forms **iron sulphide (FeS)**, a black, brittle solid. Unlike the original mixture (which is magnetic, shows separate yellow sulphur and grey iron particles, and can be separated with a magnet), FeS is a genuine compound: it is non-magnetic and cannot be separated back into iron and sulphur by any

physical method. (Note: the “rotten-egg” smell sometimes associated with this experiment only appears when the FeS product is treated with dilute acid, releasing hydrogen sulphide gas — the solid FeS itself is not smelly.)

Q8. Can a single substance be classified as both an element and a compound?

Solution: No. An element contains only one type of atom, while a compound contains two or more different elements chemically bonded in a fixed ratio — the two categories are mutually exclusive by definition.

Q9. How would life be affected if water were a mixture of hydrogen and oxygen gas rather than a compound?

Solution: Life as we know it would be impossible: hydrogen gas is highly flammable/explosive and oxygen gas supports burning, so a “mixture” version of water would not behave as a stable, life-sustaining liquid solvent at all — it would remain a hazardous gas mixture instead.

Q10. Dilute hydrochloric acid is added to iron filings, producing Gas A and iron chloride. Identify Gas A.

Solution: $\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2\uparrow$. **Gas A is hydrogen** (confirmed by the “pop” sound test with a burning splint).

Q11. Name two compounds made only of non-metal elements, with one use of each.

Solution: (Open-ended — any correct pair is acceptable.) **Carbon dioxide (CO₂)** — used in fire extinguishers and photosynthesis; **Water (H₂O)** — the universal solvent, essential for all life processes.

Q12. How can gold be classified as both a mineral and a metal?

Solution: Gold is a **mineral** because it occurs naturally in the Earth’s crust with a definite composition; it is also a **metal** because it shows metallic properties — lustre, malleability, ductility, and good electrical conductivity. These are two different, non-conflicting classification systems (geological vs chemical).

Selected “Probe and Ponder” In-text Questions

Is air a mixture? Yes — it’s a homogeneous mixture of nitrogen, oxygen, carbon dioxide, water vapour and noble gases, with a composition that can vary slightly and components that separate by physical means.

Give examples of uniform (homogeneous) and non-uniform (heterogeneous) mixtures.

Homogeneous: salt water, sugar solution, air, alloys like brass and steel. Heterogeneous: muddy water, soil, fruit salad.

Is the electrolysis of water a physical or chemical change? A **chemical change** — water decomposes into hydrogen and oxygen gas, two substances with completely different properties from water itself.

Why This Chapter Matters

Correctly telling apart elements, compounds and mixtures is the foundation of all later chemistry — from the periodic table to chemical reactions and equations in Class 9-10.

Class 8 Science Chapter 8 – Notes and Extra Questions

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

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