

CLASS 7

SCIENCE

NCERT SOLUTIONS

NCERT Solutions for Class 7 Science Chapter 5: Changes Around Us – Physical and Chemical – Curiosity

Complete NCERT Solutions for Class 7 Science Chapter 5 "Changes Around Us: Physical and Chemical" from the Curiosity textbook, covering in-text questions, exercises, and all chapter activities.

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In-Text Questions

Q1. Students describe several changes — what kinds are they?

Ice melts to become water — this is a **physical change**, since only the state changes (solid to liquid); the substance (water) remains the same.

A bud blossoms into a flower — this is a **chemical change**, since the bud cannot revert to its original form and internal chemical changes occur.

Cold water becomes warm in the open — this is a **physical change**, since the water itself is unchanged, only its temperature changes.

A banana rots — this is a **chemical change**, since its composition and texture change and it cannot be reversed.

Exercise Questions

Q1. Which statements are characteristics of a physical change? (i) State may or may not change (ii) A substance with different properties is formed (iii) No new substance is formed (iv) The substance undergoes a chemical reaction

(a) (i) and (ii) (b) (ii) and (iii) (c) (i) and (iii) (d) (iii) and (iv)

Answer: (c) (i) and (iii) — physical changes may involve a change of state, but no new substance is ever formed.

Q2. Predict whether these changes can be reversed:

Stitching cloth to a shirt — **Cannot be reversed** (undoing stitches damages the cloth).

Twisting a straight string — **Can be reversed** (the string can be untwisted).

Making idlis from batter — **Cannot be reversed** (steamed batter cannot return to its original form).

Dissolving sugar in water — **Can be reversed** (sugar can be recovered by evaporating the water).

Drawing water from a well — **Can be reversed** (the water can be returned to the well).

Ripening of fruits — **Cannot be reversed** (ripe fruit cannot become unripe again).

Boiling water in an open pan — **Can be reversed** (the evaporated water can be recovered by condensation).

Rolling up a mat — **Can be reversed** (the mat can be unrolled).

Grinding wheat into flour — **Cannot be reversed** (flour cannot be turned back into grains).

Formation of soil from rocks — **Cannot be reversed** (a slow process that cannot be undone).

Q3. True or False:

Melting of wax is necessary for burning a candle. — **True**

Collecting water vapour by condensing involves a chemical change. — **False**: condensing water vapour is a *physical* change (only the state changes, from gas to liquid).

The process of converting leaves into compost is a chemical change. — **True**

Mixing baking soda with lemon juice is a chemical change. — **True**

Q4. Fill in the blanks:

Nalini's cycle handle has brown deposits due to **rusting**, which is a **chemical** change.

Folding a handkerchief is a **physical** change and can be **reversed**.

A substance reacting with oxygen with evolution of heat is called **combustion**, a **chemical** change.

Magnesium, when burnt in air, produces **magnesium oxide**, which is **basic** in nature; burning magnesium is a **chemical** change.

Q5. Are water-to-ice and water-to-steam changes physical or chemical? Explain.

Answer: Both are **physical changes**. In each case, the chemical composition of water stays the same; only its state changes (liquid to solid, or liquid to gas). No new substance is formed.

Q6. Is curdling of milk physical or chemical? Justify.

Answer: Curdling of milk is a **chemical change**. Milk reacts with acid or bacteria to form a new substance (curd), and the change cannot be reversed back to milk.

Q7. Is soil formation from rocks physical or chemical?

Answer: It involves **both**. Wind, rain, and temperature physically break rocks into smaller pieces (physical change), while weathering also chemically alters the minerals in the rock (chemical change).

Q8. Story-based question ("Eco-friendly Prithvi"): Chopping vegetables/peeling/cutting fruits = **physical changes**; collecting peels into a pot = **physical change**; decomposition into compost = **chemical change**; seeds germinating and blooming into flowers = **chemical change**.

Q9. Classify: burning a candle, tearing paper, rusting, curdling milk, ripening fruit, melting ice, folding clothes, burning magnesium, mixing baking soda with vinegar.

Physical changes only: Tearing paper, melting ice, folding clothes.

Chemical changes only: Rusting, curdling milk, ripening fruit, burning magnesium, mixing baking

soda with vinegar.

Both physical and chemical: Burning a candle (wax melts — physical; wax burns to form new substances — chemical).

Q10. In which case(s) does lime water turn milky, and why?

Answer: When vinegar reacts with baking soda, carbon dioxide gas is released. This gas travels into the test tube containing lime water, where it reacts with the calcium hydroxide to form calcium carbonate, a white insoluble solid that makes the lime water appear milky. This confirms carbon dioxide gas is being produced — a sign of a chemical change.

Chapter Activities

Activity 5.1: Categorising everyday changes

Changes such as melting ice, boiling water, drying clothes involve only a change of state (physical changes). Changes such as making popcorn or burning wood form entirely new substances (chemical changes). **Conclusion:** changes can be grouped as those where only shape/size/state changes, versus those where new substances are formed.

Activity 5.2: Paper folding, balloons, and chalk

Folding paper into shapes and unfolding it, inflating/deflating a balloon by loosening its neck — all reversible, only shape/size change (physical changes). But pricking an inflated balloon or crushing chalk into powder cannot be undone — though the underlying material composition doesn't change, the original form is permanently lost. **Conclusion:** these are physical changes since no new substance forms, even though some are irreversible.

Activity 5.3: Testing exhaled air with lime water

Blowing exhaled air (carbon dioxide) into plain water causes no colour change. Blowing it into lime water (calcium hydroxide) turns it milky, as a white insoluble substance (calcium carbonate) forms. **Conclusion:** this is a chemical change, since a new substance is produced.

Activity 5.4: Baking soda and vinegar

Adding baking soda (sodium hydrogen carbonate) to vinegar or lemon juice produces fizzing carbon dioxide gas bubbles. Passing this gas into lime water turns it milky. **Conclusion:** new substances are formed, confirming a chemical change.

Activity 5.5: Candle and oxygen supply

An uncovered candle keeps burning since it has a continuous air (oxygen) supply. A candle covered with a glass tumbler soon goes out as the oxygen supply is cut off. **Conclusion:** oxygen is required for combustion.

Activity 5.6: Ignition temperature

A substance catches fire only once it reaches its **ignition temperature** — the minimum temperature needed for it to burn. A lit matchstick ignites paper instantly (matchstick temperature exceeds paper's ignition point), while a magnifying glass focusing sunlight slowly heats paper until it reaches ignition temperature and begins to smoke and burn. **Requirements for combustion:** (1) a combustible substance/fuel, (2) oxygen, (3) reaching ignition temperature.

Activity 5.7: Burning a candle (physical + chemical)

Melting of wax, its evaporation into wax vapour, and resolidifying of melted wax are all **physical changes**. But the burning of wax vapour to produce carbon dioxide and other products is a **chemical change**. This shows a single process can involve both types of change simultaneously.

Activity 5.8: Reversibility of everyday changes

Changes like melting ice, boiling water, drying clothes, and shaping dough can be reversed (original state restored). Changes like chopping vegetables, making popcorn, cutting paper, burning wood, and cooking food cannot be reversed. **Conclusion:** changes are classified as **reversible** (original substance can be recovered) or **irreversible** (it cannot).

Extra Questions: [Class 7 Science Chapter 5](#)

Revision Notes: [Class 7 Science Chapter 5](#)