

## NCERT QUESTIONS WITH SOLUTIONS

**1.** Which of the following statements are the characteristics of a physical change?

- (i) The state of the substance 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)

**Ans.** The correct option is (c) (i) and (iii).

A physical change may or may not involve a change in state, but no new substance is formed. Formation of a new substance and occurrence of a chemical reaction are characteristics of a chemical change.

**2.** Predict which of the following changes can be reversed and which cannot be reversed. If you are not sure, you may write that down. Why are you not sure about these?

- (i) Stitching cloth to a shirt
- (ii) Twisting of straight string
- (iii) Making idlis from a batter
- (iv) Dissolving sugar in water
- (v) Drawing water from a well
- (vi) Ripening of fruits
- (vii) Boiling water in an open pan
- (viii) Rolling up a mat
- (ix) Grinding wheat grains to flour
- (x) Forming of soil from rocks

**Ans.** (i) Stitching cloth to a shirt – Reversible (we can un-stitch the thread).

(ii) Twisting of a straight string – Reversible (we can untwist it).

(iii) Making idlis from batter – Cannot be reversed (We cannot recover the batter back).

(iv) Dissolving sugar in water – Reversible (evaporate water to get sugar back).

(v) Drawing water from a well – Reversible (water can be poured back).

(vi) Ripening of fruits – Cannot be reversed (cannot un-ripen fruits).

(vii) Boiling water in an open pan – Cannot be reversed (water vapour cannot be collected back).

(viii) Rolling up a mat – Reversible (we can unroll it again).

(ix) Grinding wheat grains to flour – Cannot be reversed (we cannot reform grains again).

(x) Forming soil from rocks – Cannot be reversed (naturally irreversible process we cannot get back rocks again).

**3.** State whether the following statements are True or False. In case a statement is False, write the correct statement.

(i) Melting of wax is necessary for burning a candle.

(ii) Collecting water vapour by condensing involves a chemical change.

(iii) The process of converting leaves into compost is a chemical change.

(iv) Mixing baking soda with lemon juice is a chemical change.

**Ans. (i)** False  
Melting of wax is necessary for burning a candle.  
It is the vapour of wax which burns to produce flame and not just the melted wax.

(ii) False  
Collecting water vapour by condensing involves a chemical change.  
Condensation is a physical change as no new substance is formed.

(iii) True  
The process of converting leaves into compost is a chemical change.  
Decomposition takes place during conversion of leaves into compost, which is a new substance.

(iv) True  
Mixing baking soda with lemon juice is a chemical change.  
The chemical reaction occurs between baking soda and lemon juice to produce carbon dioxide and other new substances, so it is a chemical change.

4. Fill in the blanks in the following statements:

(i) Nalini observed that the handle of her cycle has got brown deposits. The brown deposits are due to \_\_\_\_\_, and this is a \_\_\_\_\_ change.

(ii) Folding a handkerchief is a \_\_\_\_\_ change and can be \_\_\_\_\_.

(iii) A chemical process in which a substance reacts with oxygen with evolution of heat is called \_\_\_\_\_, and this is a \_\_\_\_\_ change.

(iv) Magnesium, when burnt in air, produces a substance called \_\_\_\_\_. The substance formed is \_\_\_\_\_ in nature. Burning of magnesium is a \_\_\_\_\_ change.

**Ans. (i)** chemical change.

(ii) physical, reversed.

(iii) combustion, chemical

(iv) magnesium oxide, white-coloured, chemical

5. Are the changes of water to ice and water to steam, physical or chemical? Explain.

**Ans.** Both are reversible physical changes. Water changes its state (solid  $\rightleftharpoons$  liquid  $\rightleftharpoons$  gas), but no new substance is formed, and its chemical composition ( $H_2O$ ) remains unchanged.

6. Is curdling of milk a physical or chemical change? Justify your statement.

**Ans.** Curdling of milk is a chemical change. New substances (curd which contains lactic acid) with different properties is formed, and the process is irreversible.

7. Natural factors, such as wind, rain, etc., help in the formation of soil from rocks. Is this change physical or chemical and why?

**Ans.** The formation of soil from rocks involves both physical and chemical changes:

**Physical changes:** Breaking of rocks into smaller pieces due to wind, water, temperature changes, and root growth (mechanical weathering).

**Chemical changes:** Reaction of minerals with water, oxygen, and acids (e.g., iron forming rust), changing the rock composition.

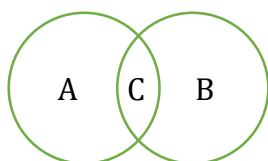
8. Read the following story titled 'Eco-friendly Prithvi' and tick the most appropriate option(s) given in the brackets. Provide a suitable title of your choice for the story.

Prithvi is preparing a meal in the kitchen. He chops vegetables, peels potatoes, and cuts fruits (physical changes/chemical changes). He collects the seeds, fruits, and vegetable peels into a clay pot (physical change/chemical change). The fruits, vegetable peels, and other materials begin to decompose due to the action of bacteria and fungi, forming compost (physical change/chemical change). He decides to plant seeds in the compost and water them regularly. After a few days, he notices that the seeds begin to germinate and small plants start to grow, eventually blooming into colourful flowers (physical change/chemical change). His efforts are appreciated by all his family members.

**Ans.** Prithvi chops vegetables, peels potatoes, and cuts fruits: Physical changes  
He collects seeds, fruit and vegetable peels into a clay pot: Physical change  
The peels decompose to form compost: Chemical change  
Seeds germinate and grow into flowering plants: Chemical change

9. Some changes are given here. Write physical changes in the area marked 'A' and chemical changes in the area marked 'B'. Enter the changes which are both physical and chemical in the area marked 'C'.

Process of burning a candle; Tearing of paper; Rusting; Curdling of milk; Ripening of fruits; Melting of ice; Folding of clothes; Burning of magnesium and Mixing baking soda with vinegar.



### Physical Changes (A)

Tearing of paper  
Melting of ice  
Folding of clothes

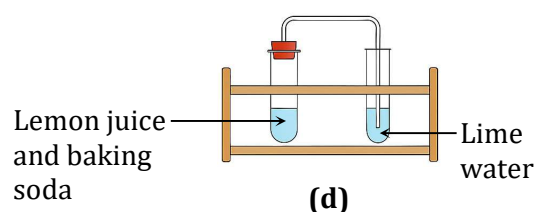
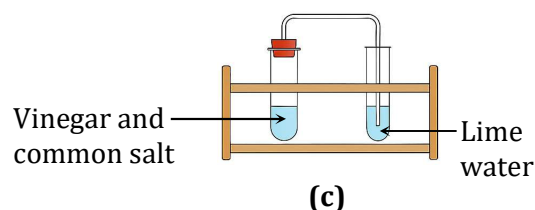
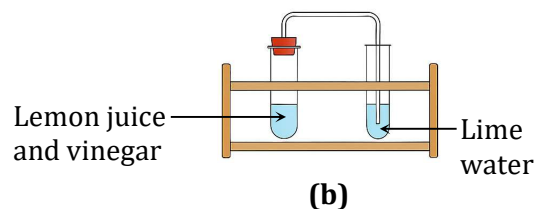
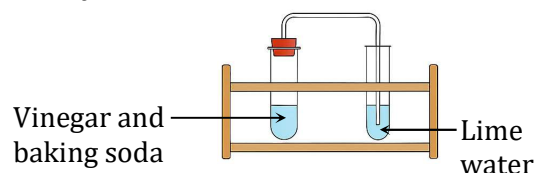
### Chemical Changes (B)

Rusting  
Curdling of milk  
Ripening of fruits  
Burning of magnesium  
Mixing baking soda with vinegar

### Both Physical and Chemical Changes (C)

Burning of a candle (wax melts — physical change, wax burns — chemical change)

10. The experiments shown in Figure a, b, c, and d were performed. Find out in which case(s) did lime water turn milky and why?



**Ans.** Lime water turns milky in cases (a) and (d) because carbon dioxide is formed, producing calcium carbonate in lime water.