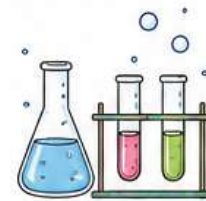




Class 7 Science – Chapter 5

Changes Around Us : Physical and Chemical



EXERCISE QUESTIONS AND ANSWERS

Q1. Which of the following statements are the characteristics of a physical change?

- The state of the substance may or may not change.
- A substance with different properties is formed.
- No new substance is formed.
- The substance undergoes a chemical reaction.

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

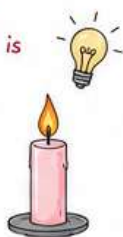
Ans. (c) (i) and (iii)



Q3. State whether the following statements are True or False. In case a statement is False, write the correct statement.

- Melting of wax is necessary for burning a candle.

Ans. True.



- Collecting water vapour by condensing involves a chemical change.

Ans. False.

Correct statement : Collecting water vapour by condensing involves a physical change.



- The process of converting leaves into compost is a chemical change.

Ans. True.



Q4. Fill in the blanks in the following statements.

- Nalini observed that the handle of her cycle has got brown deposits. The brown deposits are due to _____ and this is a _____ change.

Ans. rusting , chemical



- Folding a handkerchief is a _____ change and can be _____.

Ans. physical , reversed



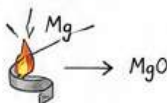
- A chemical process in which a substance reacts with oxygen with evolution of heat is called _____, and this is a _____ change.

Ans. combustion , chemical



- Magnesium, when burnt in air, produces a substance called _____. The substance formed is _____ in nature. Burning of magnesium is a _____ change.

Ans. magnesium oxide , basic , chemical



Q8. Read the following story titled 'Eco-friendly Prithin', and tick the most appropriate option(s) given in the brackets. Provide a suitable title of your choice for the story.

- Prithvi chops vegetables, peels potatoes, and cuts fruits. (Physical ✓ / Chemical)
- He collects the seeds, fruits, and vegetable peels into a clay pot. (Physical ✓ / Chemical)
- The fruits, vegetable peels, and other materials decompose into compost. (Physical / Chemical ✓)
- He decides to plant seeds in the compost and water them regularly.
- After a few days, seeds begin to germinate and small plants grow, eventually blooming into colourful flowers. (Physical / Chemical ✓)
- His efforts are appreciated by all his family members.

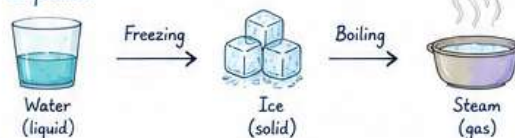
Suitable title : Prithvi's Green Kitchen



Q2. 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?

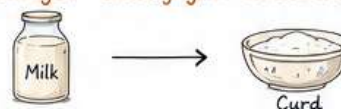
Change	Reversible/Irreversible	Reason
(i) Stitching cloth to a shirt	Irreversible	Once stitched, hard to undo without damage.
(ii) Twisting of straight string	Reversible	The string can be untwisted.
(iii) Making idlis from a batter	Irreversible	The batter cannot be returned to its original form after steaming.
(iv) Dissolving sugar in water	Reversible	Sugar can be recovered by evaporating water.
(v) Drawing water from a well	Reversible	Water can be returned to the well.
(vi) Ripening of fruits	Irreversible	Once ripe, fruits cannot go back to unripe.
(vii) Boiling water in an open pan	Reversible	Evaporated water can be obtained back by condensation.
(viii) Rolling up a mat	Reversible	The mat can be unrolled.
(ix) Grinding wheat grains to flour	Irreversible	Flour cannot be turned back into grains.
(x) Forming of soil from rocks	Irreversible	Soil formation is a slow process and cannot form rock back.

Q5. Are the changes of water to ice and water to steam, physical or chemical? Explain.



Ans. Both are physical changes. In both cases, the chemical composition of water remains the same; only its state changes.

Q6. Is curdling of milk a physical or chemical change? Justify your statement.



Ans. Curdling of milk is a chemical change because a new substance, curd, is formed and the original milk cannot be obtained back easily.

Q7. 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. Natural factors break rocks into smaller pieces (physical change) and also cause chemical changes in the minerals forming soil.



Class 7 Science – Chapter 5

Changes Around Us : Physical and Chemical



EXERCISE QUESTIONS AND ANSWERS (Continued)

- Q8.** Read the following story titled 'Eco-friendly Prithvi' and Tick (✓) the most appropriate option(s) in the brackets. Provide a suitable title of your choice for the story.

Prithvi's Green Kitchen



1. Prithvi chops vegetables, peels potatoes, and cuts fruits. (Physical ✓ / Chemical)



2. He collects the seeds, fruits and vegetable peels into a clay pot. (Physical ✓ / Chemical)



3. The fruits, vegetable peels and other materials begin to decompose due to the action of bacteria and fungi, forming compost. (Physical / Chemical ✓)



4. He decides to plant seeds in the compost and water them regularly. (Physical / Chemical ✓)



5. After a few days, the seeds begin to germinate and small plants start to grow, eventually blooming into colourful flowers. (Physical / Chemical ✓)

Suitable title : Prithvi's Green Kitchen

- Q9.** 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 ; Mixing baking soda with vinegar.

A

(Physical Changes)

- Tearing of paper
- Melting of ice
- Folding of clothes

B

(Chemical Changes)

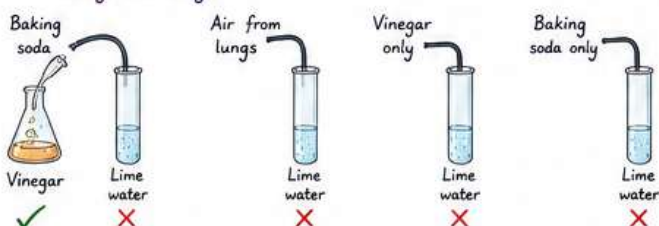
- Rusting
- Curdling of milk
- Ripening of fruits
- Burning of magnesium
- Mixing baking soda with vinegar

C

(Both Physical & Chemical Changes)

- Process of burning a candle

- Q10.** The experiments shown in Fig. 5.11 (a), (b), (c) and (d) were performed. Find out in which case(s) did lime water turn milky and why?



Ans: Only in (a) lime water turns milky because carbon dioxide gas is produced when vinegar reacts with baking soda. CO_2 gas reacts with lime water to form calcium carbonate which makes it milky.

ACTIVITY – BASED QUESTIONS

Activity 5.1 : Let Us Think and Reflect (Page 58)

Change	Observation(s)
1. Melting ice cubes	Ice melts to water, state changes.
2. Chopping vegetables	Size and shape changes.
3. Boiling water	Water changes to water vapour, state changes.
4. Making popcorn from corn	Corn gets roasted into bigger popcorns (new substance formed).
5. Cutting a piece of paper	Shape and size changes.
6. Adding beetroot extract to water	Colour of water changes to pink.
7. Burning wood	Wood changes to ash (new substance formed), heat and light produced.
8. Drying wet clothes	Water from wet clothes gets evaporated, state of water changes from liquid to gas.
9. Making small balls of dough	Shape and size changes.
10. Rolling small balls of dough into chapatis	Shape and size changes.
11. Cooking of food	Composition, smell and taste changes.
12. Making pot from mud	Shape and size changes.

Conclusion : Changes can be categorised into two types – physical changes (no new substance formed) and chemical changes (new substance(s) are formed).

Activity 5.2 : Let Us Create and Discuss (Page 59)

A. Creating some objects with paper

Only shape and size change. Original sheet can be got back by unfolding.

Physical Change

B. Playing with a balloon

Inflated balloon can be deflated and inflated again. But pricked balloon cannot be inflated again.

Physical Change

C. Crushing a piece of chalk

Chalk can be crushed into powder but cannot be changed back.

Physical Change

Observation & Conclusion : In all these cases, material remains the same but only size and shape change. These are examples of physical changes.

Activity 5.3 : Let Us Create and Discuss (Page 60)

Tumbler A (Plain water) Tumbler B (Lime water)

- Blowing air from mouth in tumbler A – No change.
- Blowing air in tumbler B – Lime water turns milky and white precipitate (calcium carbonate) settles down.

Conclusion : This is a chemical change as a new substance is formed.

Activity 5.4 : Let Us Experiment (Page 61)

Vinegar or Lemon juice + Baking soda → Fizzing sound, bubbles of CO_2 gas produced

Passing sound, through straw gas produced

Lime water turns milky

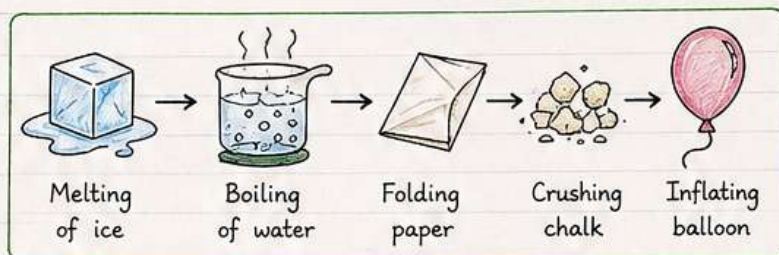
Conclusion : New substances are formed in this process. Hence, it is a chemical change.

CO_2

1. PHYSICAL CHANGES

- Changes in which only physical properties (shape, size, state or appearance) change.
- No new substance is formed.
- Most physical changes are reversible.

Examples: Melting of ice, boiling of water, folding paper, crushing chalk into powder, inflating a balloon.



2. CHEMICAL CHANGES & REACTIONS

- A change in which one or more new substances with entirely different properties are formed.
- The process by which a chemical change occurs is called a chemical reaction.

LIME WATER TEST FOR CO₂ :

Carbon dioxide + Lime water → Calcium carbonate + Water
(Calcium hydroxide) (Insoluble - milky)

CO₂ turns lime water milky due to insoluble calcium carbonate formation.

VINEGAR + BAKING SODA REACTION :

Vinegar + Baking soda → Carbon dioxide + Other substances

3. KEY CHEMICAL PROCESSES

- * **RUSTING** : Iron reacts with oxygen and moisture to form iron oxide (rust).

Iron + Oxygen + Water → Iron oxide (Rust)



- * **BURNING MAGNESIUM RIBBON** :

Magnesium burns with a dazzling white flame to form a basic oxide (magnesium oxide powder).

Magnesium + Oxygen → Magnesium oxide + Heat + Light



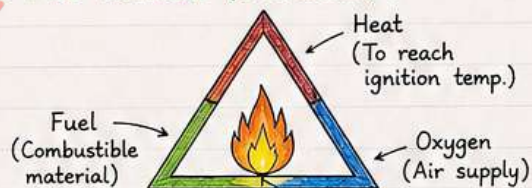
- * **COMBUSTION** : A chemical reaction in which a substance reacts with oxygen to release heat and/or light. Substances that undergo combustion are called combustible substances (e.g., wood, paper, kerosene).



4. REQUIREMENTS FOR COMBUSTION & FIRE SAFETY

- **IGNITION TEMPERATURE** : The minimum temperature required for a combustible substance to catch fire.

- **FIRE TRIANGLE (3 Essentials)** :



- **FIRE CONTROL** : Wrapping a person with a woollen blanket cuts off oxygen supply.

Caution : Synthetic blankets should never be used as they melt and stick to skin.

5. SIMULTANEOUS PHYSICAL & CHEMICAL CHANGES

Example - BURNING CANDLE

Physical changes :

- Melting of wax
- Flowing of liquid wax
- Solidification of wax
- Evaporation of liquid wax



Chemical change :

Burning of wax vapour to produce light, heat and carbon dioxide. New substances are formed.

6. CLASSIFICATION OF CHANGES

Type of Change	Characteristics	Examples
Reversible	Original substance can be recovered back.	Melting ice, boiling water, unrolling a mat.
Irreversible	Original substance cannot be retrieved.	Chopping vegetables, making popcorn.
Desirable	Useful changes occurring in daily life.	Ripening fruits, turning milk into curd, composting.
Undesirable	Harmful or unwanted changes.	Rusting of iron, decay of stored food, pollution.

7. SLOW NATURAL CHANGES

- * **WEATHERING OF ROCKS** : Physical and chemical breaking of rocks into sediments, leading to soil formation over long periods.

- **Physical weathering** : Temperature fluctuations, freezing water expanding in cracks, root growth breaking rocks.
- **Chemical weathering** : Minerals reacting with water/oxygen (e.g., black basalt → red iron oxide).

- * **EROSION** : Breakdown and movement of soil/rocks from one place to another by wind or flowing water. (Physical change)



8. FASCINATING SCIENTIFIC FACTS

- * **BIOLUMINESCENCE** : Light emitted without heat by living organisms like fireflies through a chemical change.



- * **MICHAEL FARADAY** : Famous scientist who delivered lectures titled "Chemical History of a Candle" detailing physical and chemical processes.



REMEMBER :

- Physical change → No new substance.
- Chemical change → New substance formed.
- Rusting → Iron + Oxygen + Water.

- Combustion → Fuel + Oxygen + Heat.
- Fire Triangle → Fuel + Oxygen + Heat.
- CO₂ + Lime water → Milky.

- Burning candle → Physical + Chemical changes.
- Weathering → Breaking down of rocks.
- Erosion → Breaking + movement of soil/rocks.

