

Chapter 1. The Ever-Evolving World of Science

YOUR ASSIGNMENT

I. Multiple Choice Questions:

1. (b) Shadow of objects
2. (b) Curiosity
3. (c) Seasons and day-night cycle
4. (c) To understand material properties
5. (c) Butterfly and paper plane
6. (c) Understanding nature and solving environmental issues
7. (b) Melting of ice

II. Fill in the Blanks:

1. shadows
2. process of discovery

3. paper plane
4. Light
5. reversible.
6. axis
7. asking questions

III. True/False:

1. False
2. True
3. False
4. False
5. True
6. False
7. False

IV. Match the Columns A and B:

Column A	Column B
(a) Melting of ice	4. Reversible change
(b) <i>Haladi</i> stain on uniform	2. Chemical indicator
(c) Rotation of Earth	5. Causes day and night
(d) Paper plane	1. Inspired flight experiments
(e) Shadow under the Sun	3. Used to measure time in past

V. Very Short Answer Type Questions:

1. Science encourages us to ask questions and explore.
2. The design of page numbers.
3. Eclipses.
4. Reversible change.
5. Sunlight and shadows.
6. To understand how and why things happen.
7. Biology (others include physics, chemistry, earth science).

noon, the sun is overhead, producing shorter shadows.

2. To make brushing teeth more eco-friendly, use a cup to reduce water wastage and a biodegradable toothbrush, ensuring personal needs are met while conserving resources.

VI. Life Skills/Skill-Based Questions:

1. Shadows are longer in the morning and evening and shorter at noon because the sun is low on the horizon during those times, casting longer shadows, while at

VII. Assertion-Reason Based Questions:

1. (c) Assertion (A) is true, but Reason (R) is false.
2. (d) Assertion (A) is false, but Reason (R) is true.
3. (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

VIII. Picture Based Question:

- (a) He was curious why the apple didn't fall sideways or upwards.

IX. Case Study Based Questions:

- (b) Because the Sun is lower in the sky during those times.
- (c) By planting trees and saving electricity.

Chapter 2. Exploring Substances : Acidic, Basic, and Neutral

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- (iii) Vinegar
- (iv) Basic, basic, and basic
- Fig. (a): Basic (red rose extract turns green)
Fig. (b): Neutral (red rose extract shows no change)
Fig. (c): Acidic (red rose extract turns red)
- The liquid is acidic in nature.

Justification: It does not affect red litmus paper, but it turns blue litmus paper red, which is an indication of acidic nature. Also, there is no change in the turmeric indicator, confirming its acidic nature as turmeric does not change in acidic or neutral solutions, it only turns red in basic solutions

- Manya should use an olfactory indicator like onion strips to test the solutions. Olfactory indicators change their smell in acidic or basic solutions. For example, substances like onion produce a strong smell in a basic solution and a mild smell in an acidic solution.
- The colour of the writing will depend on the nature of the writing material (acidic or basic) and the solution in the spray bottle (acidic or basic). Below is the table of possible combinations.

Writing Material	Substance in Spray Bottle	Colour of Writing (on paper)
Lemon juice	Blue litmus solution	Red
Baking soda solution	Red litmus solution	Blue

Baking soda solution	Rose extract	Green
Vinegar	Rose extract	Red
Soap solution	Turmeric solution	Red
Amla juice	Indian blackberry juice	Pink
Lime water	Indian blackberry juice	Purple
Grapes juice	Beetroot extract	Red
Washing powder solution	Beetroot extract	Blue
Tamarind water	Red hibiscus extract	Pink
Soap solution	Red hibiscus extract	Green

- If baking soda is added to the mixture of grape juice and red rose extract, the colour is likely to change from a red tint to green.

Justification: This is because grape juice is acidic, which turns the red rose extract red, and baking soda is a basic substance. The red rose extract changes to green in the presence of a base, indicating a neutralization reaction where the acidic nature of the grape juice is altered by the basic baking soda.

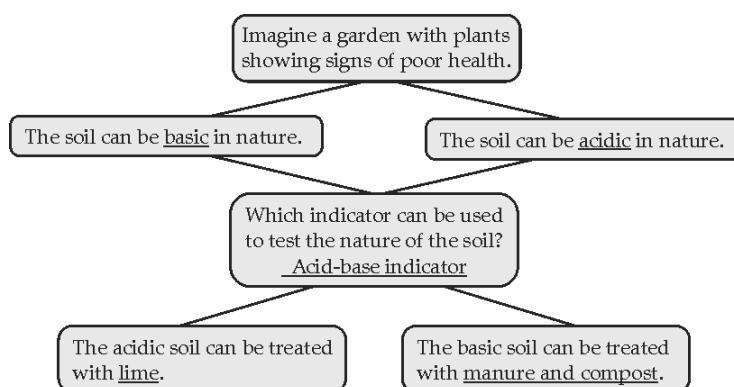
- Keerthi's grandmother can reveal the secret message by spraying the paper with red-rose extract (or using a red-rose indicator solution). Keerthi's message was

written with orange juice (an acid). Red-rose extract turns red in acidic solutions, so spraying the paper with red-rose extract will make the acidic orange-juice writing show up red and reveal the secret message.

9. Natural indicators are prepared by extracting the colour from flowers/vegetables/spices using water (often hot water), then filtering the coloured liquid.

Example to make red rose extract: collect fallen red-rose petals → wash and crush them → pour hot water over crushed petals → let steep 5–10 minutes → filter the mixture → the filtrate is the red-rose extract indicator.

12.



YOUR ASSIGNMENT

I. Multiple Choice Questions:

- (c) Lichens
- (c) Baking soda solution
- (c) Basic
- (b) Lime
- (c) Blue
- (b) Vanilla essence
- (c) Neutralisation

II. Fill in the Blanks:

- lichens
- calcium hydroxide

10. Using turmeric paper, we can identify a basic solution but not an acidic or neutral solution. When baking soda solution (basic) is tested, the turmeric paper will turn red. However, both vinegar (acidic) and sugar solution (neutral) will leave the paper yellow, as turmeric paper does not change colour in acidic or neutral solutions. Therefore, turmeric paper can only identify a basic solution.

11. Liquid X is basic. Adding excess amla juice (an acid) to X will neutralise it and, if enough acid is added to make the solution acidic, the red-rose extract colour will change from green to red (passing through neutral).

- acids
- Turmeric
- formic acid
- Acharya Prafulla Chandra Ray
- salt

III. True/False:

- False
- True
- False
- True
- False
- False
- True

IV. Match the Columns A and B:

Column A	Column B
(a) Litmus	3. Natural indicator
(b) Hydrangea flower	1. Blue in acidic soil
(c) Lichen	2. Fungus + Algae
(d) Neutralisation	4. Produces salt + water + heat
(e) Baking soda	5. Neutralises formic acid

V. Very Short Answer Type Questions:

1. Lichens
2. Blue
3. Turmeric / Red rose / Beetroot
4. Bitter
5. Salt, water and heat are produced (neutralisation reaction).
6. Hydrangea
7. It neutralises acidic soil.

carefully prevents further injury or infection.

VII. Assertion-Reason Based Questions:

1. (c) Assertion (A) is true, but Reason (R) is false.
2. (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
3. (d) Assertion (A) is false, but Reason (R) is true.

VI. Life Skills/Skill-Based Questions:

1. Add turmeric or red cabbage extract to household liquids; acids turn turmeric red and cabbage pink, bases turn turmeric yellow and cabbage greenish, letting you identify each substance by its colour change.
2. Applying baking soda paste to skin irritation neutralises acids and reduces discomfort; handling such problems

VIII. Picture Based Question:

(c) Solution A is acidic, Solution B is basic

IX. Case Study Based Questions:

1. (c) Bubbles were produced, and the solution became closer to neutral
2. (b) By using baking soda paste to neutralise the acid

Chapter 3. Electricity: Circuits and their Components

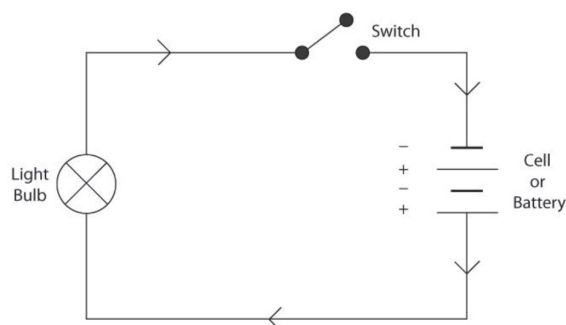
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1. (i) A switch is the source of electric current in a circuit.
2. The lamp will not glow if a non-conducting material (like plastic, rubber, or wood) is connected between A and B. This will break the circuit and stop the flow of electricity
3. No, the other lamp will not glow. When the filament of one lamp breaks, the circuit becomes open (current cannot flow). Since both lamps are connected in

series, the current stops and both lamps go off.

4. No, the lamp will not glow. The insulator (plastic covering) around wires does not allow current to pass. Since the current cannot pass through the insulated parts of the wires, the circuit remains incomplete, and the lamp will not light up.
- 5.

Circuit Diagram of a Torch



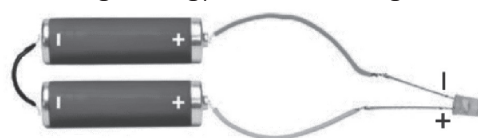
N.B. : Arrows indicate flow of current.

6. (i) None of the lamps will glow.
(ii) L_1 will glow.
(iii) Both L_1 and L_2 will glow.
(iv) None of the lamps will glow.
7. (i) **Wires may be loose or not properly connected:** Check the connections one by one to the battery, lamp, and switch.
(ii) **The lamp's filament may be broken:** Try replacing the bulb with a new one to see if it works.
(iii) **The cell may be weak or dead:** Check if the battery is providing power by testing with a multimeter.
(iv) **The switch might be faulty:** Test the switch by bypassing it (connect the wires directly) to see if the lamp glows.
8. In case (c), LEDs allow current to flow in only one direction. Due to the wrong polarity, the current will not flow and the LED will not glow.
9. You can connect the unknown battery to a working bulb using wires. If the bulb glows, mark one end as '+' and the other as '-', as electric current always flows from the positive terminal to the negative terminal through the circuit.
10. (i) **Items Required:** Light bulb, connecting wires and cells (A, B, C, D, E, F)
(ii) **Procedure:** (a) Connect the light bulb to one cell with the help of wires. (b) Observe if the bulb glows. (c) Repeat

the process for each cell (A, B, C, D, E, F).

(iii) Observation: The cells that make the bulb glow are working, and those that do not are dead.

11. No, the LED will not glow if the cells are connected in the same direction (both positive sides together). The correct connection to let the bulb glow has been shown below as the cells in series combine their voltage, which provides enough energy for the LED to glow.



YOUR ASSIGNMENT

I. Multiple Choice Questions:

1. (c) Electric cell
2. (b) Filament
3. (b) Negative terminal of the next cell
4. (c) Copper
5. (c) Alternating Current (AC)
6. (c) Protruding metal cap
7. (c) IEC

II. Fill in the Blanks:

1. filament
2. battery
3. positive, negative
4. open, close
5. Direct Current (DC)
6. open
7. conductors

III. True/False:

1. True
2. False
3. True
4. False
5. True
6. False

7. True

IV. Match the Columns A and B:

Column A	Column B
(a) LED	2. Directs current in one direction
(b) Electric Cell	1. Positive terminal is the metal cap
(c) Switch	4. Completes or breaks a circuit
(d) Incandescent Lamp	3. Has a glowing filament
(e) Battery	5. A combination of two or more cells

V. Very Short Answer Type Questions:

1. Positive terminal and Negative terminal.
2. To open or close the circuit.
3. Current does not flow.
4. Metal strip or thick wire.
5. Insulators.
6. Light Emitting Diode.
7. From positive to negative terminal of the cell.

not in use; each step prevents shocks, burns, or equipment damage.

VII. Assertion-Reason Based Questions:

1. Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
2. Assertion (A) is false, but Reason (R) is true.
3. Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

VI. Life Skills/Skill-Based Questions:

1. Connect the cell's positive to LED's longer leg and negative to the shorter leg, add a switch, and observe that the LED glows only with proper connections; this shows the flow of current and importance of polarity.
2. Safety precautions: Use insulated wires, dry hands, avoid short circuits, check connections, and disconnect power when

VIII. Picture Based Question:

- (c) The bulb will glow.

IX. Case Study Based Questions:

1. (c) The LED allows current to flow in only one direction.
2. (c) Ensuring the correct connection and handling wires carefully.

Chapter 4. The World of Metals and Non-metals

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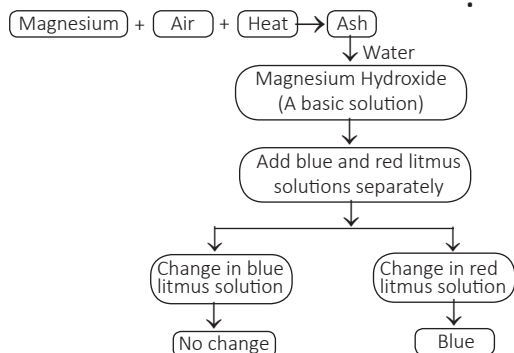
1. (i) Aluminium
2. (iv) Sodium
3. (i) [F] Aluminium and copper are metals, not non-metals.
(ii) [F] Metal oxides are basic, they turn red litmus blue.
(iii) [T] Oxygen, a non-metal, is necessary for all living beings to respire.
(iv) [F] Copper vessels are used for heat conduction, not for conducting

electricity while boiling.

4. Only a few metals like gold, silver, and platinum are suitable for making jewellery because they are lustrous, malleable, ductile, and do not corrode easily when exposed to air or moisture.
5. (i) – (c), (ii) – (e), (iii) – (a), (iv) – (d), (v) – (b)
6. When oxygen reacts with magnesium, it forms magnesium oxide, which is basic in nature. When oxygen reacts with sulphur, it forms sulphur dioxide, which dissolves

in water to form sulphurous acid, an acidic solution. Hence, metal oxides are basic and non-metal oxides are acidic.

7



8. For boiling water, the pan must be made of a material that is a good conductor of heat. Among the given materials, only iron and copper are metals and both are good conductors of heat. However, copper is the best choice for making a pan to boil water because it is highly resistant to rust compared to iron.

9. The iron nail dipped in oil will not rust because oil prevents contact with air and moisture, which are essential for rusting to occur.

10. Metals and non-metals have various properties that make them useful in our everyday life. Metals are used in making wires and cables (due to electrical conductivity); kitchenware and utensils (due to heat conductivity); structures, tools, and weapons (for their strength and hardness); bells (because of sonority); and jewellery (due to lustre, malleability, and ductility).

Non-metals are usually brittle, poor conductors, and lack metallic lustre, but they are useful in other ways for example, oxygen for breathing, graphite in pencils and dry cell batteries, chlorine for water purification, nitrogen in fertilizers, and plastic and rubber as insulators.

11. No, sulfur cannot be used to protect iron from rusting because it does not form a protective metallic coating and is not a metal. Zinc, being a metal, forms a strong protective layer that prevents air and water contact with iron.

12. An ironsmith heats iron before making tools because it softens the iron and increases its malleability, making it easier to bend, shape, and form into the desired tool.

YOUR ASSIGNMENT

I. Multiple Choice Questions:

- (c) Sodium
- (a) Mercury
- (b) Ductility
- (b) Sulfur
- (c) Sodium
- (c) Rust
- (c) Oxygen

II. Fill in the Blanks:

- lustrous
- malleability
- poor
- Iodine
- corrosion
- water
- sonority

III. True/False:

- False
- True
- False
- True
- False
- False
- True

IV. Match the Columns A and B:

Column A	Column B
(a) Copper	3. Malleable and good conductor of electricity
(b) Sulfur	5. Brittle and non-lustrous
(c) Aluminium	4. Used in foils and aircraft
(d) Mercury	1. Only metal in liquid form at room temperature
(e) Sodium	2. Soft metal stored in kerosene

V. Very Short Answer Type Questions:

1. Mercury
2. Rusting
3. Ductility
4. Sodium
5. Nitrogen
6. Insulator
7. Paint or zinc coating (galvanisation)

from moisture and air to extend their life and keep them functional.

VII. Assertion-Reason Based Questions:

1. (c) A is true, but R is false.
2. (a) Both A and R are true, and R is the correct explanation of A.
3. (a) Both A and R are true, and R is the correct explanation of A.

VI. Life Skills/Skill-Based Questions:

1. Metals like copper and iron are lustrous, malleable, and conduct electricity; non-metals like charcoal and sulfur are dull, brittle, and don't conduct electricity. A table helps compare these properties.
2. Prevent corrosion by painting, covering, and drying metal items, protecting them

VIII. Picture Based Question:

- (c) Magnesium oxide

IX. Case Study Based Questions:

1. (b) Metals are malleable while non-metals are brittle
2. b) She covered them with paint and kept them dry

Chapter 5. Changes Around Us: Physical and Chemical

NCERT CORNER

1. (c) (i) and (iii)
2. (i) Cannot be reversed. Once stitched, cloth cannot be brought back to its original pieces easily.
(ii) Can be reversed. The string can be straightened again.
(iii) Cannot be reversed. The batter cannot be returned to its original form after steaming.
(iv) Can be reversed. Water can be evaporated to get sugar back.
(v) Can be reversed. Water can be poured back into the well.
(vi) Cannot be reversed. Once ripened,

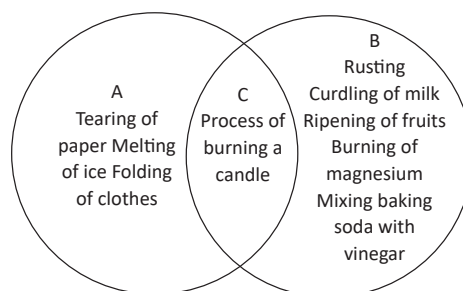
fruit cannot become raw again.

- (vii) Can be reversed. Vapour can condense to form water again.
(viii) Can be reversed. The mat can be unrolled again.
(ix) Cannot be reversed: Flour cannot be turned back into grains.
(x) Cannot be reversed. It takes thousands of years and cannot be undone.
3. (i) False. Burning of wax is a chemical change, while melting is only a physical change.
(ii) False. Collecting water vapour by condensing involves a physical change.
(iii) True (iv) True

4. (i) Rusting, chemical
(ii) Physical, reversed
(iii) Combustion, chemical
(iv) Magnesium oxide, basic, chemical
5. Both are physical changes. In both processes, only the state of water changes from liquid to solid (ice) or liquid to gas (steam). No new substance is formed, and the changes are reversible.
6. The curdling of milk is a chemical change because, during this process, milk reacts with acid or bacteria, forming new substances like curd. This change cannot be reversed, which makes it a chemical change.
7. The formation of soil from rocks involves both physical and chemical changes. Natural factors like wind, rain and temperature break down rocks into smaller pieces (physical change). Rocks can also react chemically with water, air (oxygen) or acids dissolved in rainwater, changing their composition (like rusting of iron minerals in rocks), which are chemical changes. Both types of changes work together to form soil.
8. Suitable title: "Eco-friendly Prithvi"

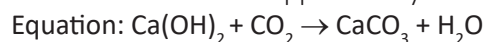
Step	Type of Change
Chopping vegetables, peeling potatoes, cutting fruits	Physical change
Collecting peels and seeds into a pot	Physical change
Formation of compost (decomposition)	Chemical change
Germination and growth of plants	Chemical change

9.



10. Lime water turns milky in experiments (a) and (d).

Reason: Both reactions produce carbon dioxide (CO_2) gas. When this gas is passed through lime water (Ca(OH)_2), it reacts to form calcium carbonate (CaCO_3), which makes the lime water appear milky.



YOUR ASSIGNMENT

I. Multiple Choice Questions:

1. (b) Melting of ice
2. (c) Carbon dioxide
3. (d) Burning of magnesium
4. (c) Iron oxide
5. (c) Ignition temperature
6. (b) Fireflies
7. (c) Making popcorn

II. Fill in the Blanks:

1. physical
2. chemical
3. weathering
4. calcium carbonate
5. formic acid
6. combustion
7. erosion

III. True/False:

1. False
2. True
3. False
4. True
5. True
6. False
7. False

IV. Match the Columns A and B:

Column A	Column B
(a) Lime water + CO ₂	3. Calcium carbonate forms
(b) Melting of wax	1. Physical change
(c) Minimum temperature to burn	2. Ignition temperature
(d) Rusting	5. Iron oxide forms
(e) Burning of wood	4. Combustion reaction

V. Very Short Answer Type Questions:

1. Physical change
2. Calcium carbonate
3. Chemical change
4. A chemical reaction where a substance reacts with oxygen to produce heat or light.
5. Kerosene
6. Bioluminescence
7. The breakdown of rocks by physical or chemical changes.

VI. Life Skills/Skill-Based Questions:

1. Melting ice is a physical change: it reverses upon cooling and no new substance is formed. Cooking eggs is chemical: it's irreversible and produces a new substance with a different appearance.
2. Rusting iron and food spoilage are undesirable; prevent them by storing

food in airtight containers and keeping metal tools dry or coated.

VII. Assertion-Reason Based Questions:

1. (d) Assertion is false, but Reason is true.
2. (c) Assertion is false, but Reason is true.
3. (a) Both Assertion and Reason are true, and Reason is the correct explanation of Assertion.

VIII. Picture Based Question:

(c) Chemical change indicating presence of carbon dioxide

IX. Case Study Based Questions:

1. (b) Because it could be reversed and no new substance was created
2. (b) It is a chemical change because a new substance is formed and it cannot be reversed

Chapter 6. Adolescence : A stage of Growth and Change

NCERT CORNER

1. (i) The possible reason for the development of pimples could be due to the hormonal changes that occur during puberty. During this time, the body produces more hormones, which can make the skin's oil glands produce excess oil. This excess oil can clog the pores, leading to pimples or acne.
(ii) To get relief from pimples, Ramesh should:
 - Wash his face twice a day with mild

soap and clean water.

- Avoid touching or squeezing pimples.
 - Eat a balanced diet rich in fruits and vegetables.
 - Drink plenty of water and maintain cleanliness.
2. Food group (ii) would be a better option for adolescents as it is rich in proteins, vitamins, and minerals, such as milk, pulses, fruits, vegetables, and whole grains. Such foods are important for growth, development, and overall health as adolescents require extra nutrients because their bodies are growing rapidly

during adolescence. Avoid junk food, as it lacks essential nutrients.

3. (i) nstmnoiaretu - menstruation
(ii) iceov xob - voice box
(iii) urtvpeb - puberty
(iv) lahoclo; srugd - alcohol; drugs
4. No, Shalu is not completely correct. Adolescence not only brings physical changes such as height increase or body hair growth but also involves emotional, mental, and social changes. Adolescents experience mood swings, develop a stronger sense of identity, and learn to make independent decisions.
5. (i) Do you think understanding and managing emotional and behavioural changes helps adolescents adjust better?
(ii) Are you aware that many harmful substances can cause addiction even after one use?
6. Other behavioural changes during adolescence include:
 - (i) Desire for independence and self-identity.
 - (ii) Increased curiosity and questioning attitude.
 - (iii) Attraction towards the opposite gender.
 - (iv) Feeling of insecurity or confusion at times.
 - (v) Tendency to spend more time with friends than family.
7. Suggestions for good menstrual hygiene include:
 - (i) Use clean, hygienic sanitary pads or menstrual cups.
 - (ii) Change pads every 4–6 hours.
 - (iii) Wash the genital area with clean water and mild soap.
 - (iv) Wrap used pads in paper and dispose of them in covered bins.
 - (v) Avoid flushing pads into the toilet.

(vi) Maintain overall cleanliness and wear comfortable cotton clothes.

8. The possible reason for the doctor advising Mary and Manoj differently is that:
 - (i) Mary's bulge was due to goitre, a disease caused by iodine deficiency, hence the doctor advised an iodine-rich diet.
 - (ii) Manoj's neck bulge was due to the enlargement of the voice box (larynx), which is a normal change during adolescence in boys. This leads to a deeper voice and is not a medical condition.

9

Physical changes during adolescence		
Observed only in boys	Observed only in girls	Common in boys and girls
Change in voice	Development of breasts	Pimples on the face
Growth of moustache		Growth of hair in the pubic region
Growth of facial hair		Growth of hair in armpits

10. Do it yourself. Prepare a poster mentioning following healthy lifestyle tips for adolescents:
 - Eat a balanced diet rich in proteins, vitamins, and minerals.
 - Drink plenty of water and avoid junk food.
 - Maintain personal hygiene and cleanliness.
 - Get adequate sleep and rest daily.
 - Exercise or play outdoor games regularly.
 - Avoid alcohol, smoking, and drugs.
 - Develop positive thinking and manage stress.
 - Respect parents, teachers, and peers.
 - Spend time in constructive hobbies

like reading or art.

- Stay confident and make healthy choices for a bright future!

YOUR ASSIGNMENT

I. Multiple Choice Questions:

1. (d) Puberty
2. (c) Growth of facial hair
3. (c) 28–30 days
4. (b) Hormones
5. (c) Jan Aushadhi Kendras
6. (c) Dorothy Hodgkin
7. (c) 14446

II. Fill in the Blanks:

1. adolescence
2. hormone
3. menstruation
4. Biodegradable
5. iron
6. Nasha Mukh Bharat Abhiyaan
7. personal information

III. True/False:

- | | |
|----------|----------|
| 1. False | 2. False |
| 3. True | 4. False |
| 5. True | 6. False |
| 7. True | |

IV. Match the Columns A and B:

Column A	Column B
(a) Puberty	3. Onset of physical and sexual maturity
(b) Menstruation	1. Monthly bleeding in adolescent girls
(c) Dorothy Hodgkin	4. Studied structure of Vitamin B12
(d) Nasha Mukh Bharat Abhiyaan	5. Awareness against substance abuse
(e) Secondary sexual characteristics	2. Facial hair, voice change, etc.

V. Very Short Answer Type Questions:

1. It is the stage between childhood and adulthood.
2. Development of breasts.
3. It is the monthly discharge of blood from the female body.
4. Around 10 years of age.
5. They control physical and emotional changes.
6. Menstrual Hygiene Scheme (MHS).
7. It is the regular use of harmful and addictive substances like tobacco or alcohol.

health problems, stay mentally alert, and maintain focus on goals, ensuring physical and mental strength.

VII. Assertion-Reason Based Questions:

1. (a) Both A and R are true, and R is the correct explanation of A.
2. (d) A is false, but R is true.
3. (d) A is false, but R is true.

VIII. Picture Based Question:

- (b) Pituitary gland

IX. Case Study Based Questions:

VI. Life Skills/Skill-Based Questions:

1. Eat a balanced diet, keep clean, and exercise daily; these habits maintain physical health, support growth, and keep the body strong during adolescence.
2. Say "NO" to addictive substances to avoid

1. (b) Because she did not understand that it is a normal change during adolescence
2. (c) Following a healthy routine and listening to guidance from family and teachers

Chapter 7. Heat Transfer in Nature

NCERT CORNER

1. (i) (c) (ii) (d) (iii) (c)
2. Yes, the arrangement will keep the lassi cold for a longer time. The air trapped between the two tumblers acts as an insulator since air is a poor conductor of heat. It reduces the transfer of heat from the surroundings to the lassi, helping it stay cool for a longer period.
3. (i) False. In solids heat transfers mainly by conduction (particles don't move freely in solids).
 (ii) True. In convection, warm fluid rises and cooler fluid sinks, so particles move and carry heat with them.
 (iii) False. Clay has very small pores and so water moves through it very slowly. Sandy soils have larger spaces, so water seeps faster through sand than clay.
 (iv) True. At night land cools faster than sea, so cooler air flows from land to sea called land breeze.
4. Ice cubes receive heat from their surroundings, the warmer air, the dish, and any objects nearby (through conduction, convection and radiation). This absorbed heat increases the ice's temperature until it melts into water.
5. The smoke will move upward (away from the stick) because warm air and smoke rise. Even if the stick points downward, the hot gases and smoke rise upward.
6. In Fig. 7.16(a), the thermometer is placed at the top of the test tube and candle flame heats the bottom of the test tube directly. The water at the bottom gets heated first. As the water heats up, it rises due to convection, carrying heat to the top, where the thermometer is placed. So, the thermometer quickly records a temperature rise.
 In Fig. 7.16(b), the thermometer is placed at the bottom of the test tube,

but the candle flame heats the side of the test tube. The side heating may not be as effective in transferring heat to the bottom where the thermometer is placed. Therefore, the thermometer in Fig. (a) will record a higher temperature.

7. Hollow bricks trap air inside their cavities. Air is a poor conductor of heat, so the brick becomes a better insulator. This reduces heat entering the house during the day, keeping interiors cooler.
8. Large water bodies like seas and oceans prevent extreme conditions in areas around them. In coastal areas during day, the land heats up faster than water, so cooler air from the sea flows towards the land (sea breeze), keeping the temperature moderate. At night, land cools down faster than water. The air above the sea remains warmer, while the cooler air from the land moves towards the sea (land breeze). This movement of air helps prevent extreme temperatures in coastal regions.
9. The entire process takes place in following steps:
 - Rainfall or surface water infiltrates the soil surface.
 - Water moves downwards through pores and cracks in soil and rocks (this process is called percolation).
 - Water collects in spaces between soil particles and in rock fractures; when these spaces are saturated they form groundwater.
 - Layers of permeable material (sand, gravel) that store and transmit water are called aquifers. Impermeable layers (clay, rock) restrict movement and form water tables.
10. The water cycle helps in the continuous redistribution and replenishment of water on Earth through the movement of water in different stages, such as evaporation, condensation and precipitation. Water from oceans, rivers and lakes evaporates due to the Sun's heat, forms clouds through

condensation, and falls back to Earth as rain or snow through a process called precipitation. The rain refills lakes, rivers and groundwater, ensuring the continuous availability of water on Earth.

YOUR ASSIGNMENT

I. Multiple Choice Questions:

1. (c) Conduction
2. (c) Wood
3. (b) They trap air, which is a poor conductor of heat
4. (c) Radiation
5. (b) They reflect most of the heat
6. (a) Land heats up faster than sea, causing air to rise over land and cooler air from sea to move in
7. (b) A man-made structure to store ice

II. Fill in the Blanks:

1. Convection
2. Insulators
3. Radiation
4. Transpiration
5. Water cycle
6. Dark-coloured
7. Bukhari

III. True/False:

1. True
2. False
3. True
4. False
5. False
6. True
7. False

IV. Match the Columns A and B:

Column A	Column B
(a) Conduction	1. Transfer of heat through solids
(b) Convection	2. Transfer of heat through liquids and gases
(c) Radiation	3. Transfer of heat without a medium
(d) Insulators	4. Materials like wood and glass
(e) Bukhari	5. Traditional room heater in Himalayan region

V. Very Short Answer Type Questions:

1. Transfer of heat through solids without the movement of particles.
2. Wood
3. Because they absorb more heat.
4. Radiation
5. It is used to keep rooms warm in the Himalayan region.
6. The process by which plants release water vapour into the atmosphere.
7. The continuous movement of water through evaporation, condensation, and precipitation.

thermos flasks are poor conductors and help handle hot or cold items safely.

2. Use thick walls for insulation and reflective window glass, or wear layered clothing; these methods help keep homes warm in winter and cool in summer by controlling heat transfer.

VII. Assertion-Reason Based Questions:

1. (c) Assertion (A) is true, but Reason (R) is false.
2. (d) Assertion (A) is false, but Reason (R) is true.
3. (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

VI. Life Skills/Skill-Based Questions:

1. Metal utensils conduct heat and are used for cooking, while wooden spoons and

VIII. Picture Based Question:

- (c) Heat transfer through conduction

IX. Case Study Based Questions:

- (b) Because metal is a good conductor of heat and wood is a poor conductor.
- (b) By adding thick curtains and using insulated doors to control heat.

Chapter 8. Measurement of Time and Motion

NCERT CORNER

1. $\text{Speed} = \frac{\text{Distance}}{\text{Time}} = \frac{150 \text{ m}}{10 \text{ s}} = 15 \text{ m/s}$

Convert m/s to km/h:

$$1 \text{ m/s} = 3.6 \text{ km/h}$$

$$15 \text{ m/s} = 15 \times 3.6 = 54 \text{ km/h}$$

The speed of the car is 15 m/s or 54 km/h.

2. A runner completes 400 metres in 50

Runner A: $\text{Speed} = \frac{400}{50} = 8 \text{ m/s}$

Runner B: $\text{Speed} = \frac{400}{45} = 8.89 \text{ m/s}$

Difference in speed: $8.89 - 8 = 0.89 \text{ m/s}$

The second runner is faster by 0.89 m/s.

3. Convert distance to metres: $360 \text{ km} = 360 \times 1000 = 360000 \text{ m}$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{360000}{25} = 14400 \text{ s}$$

Convert seconds to hours: $14400 \div 3600 = 4 \text{ h}$

The train takes 4 hours to cover 360 km.

4. (i) km/h

$$\text{Speed} = \frac{180}{3} = 60 \text{ km/h}$$

(ii) m/s

$$1 \text{ km/h} = \frac{1000}{3600} = 0.277 \text{ m/s}$$

$$60 \text{ km/h} = 60 \times 0.277 = 16.67 \text{ m/s}$$

(iii) Distance in 4 h at same speed:

$$\text{Distance} = 60 \times 4 = 240 \text{ km}$$

5. Convert train's speed to m/s:

$$72 \text{ km/h} = \frac{72 \times 1000}{3600} = 20 \text{ m/s}$$

The train (20 m/s) is faster than the horse (18 m/s) by 2 m/s.

6. **Uniform motion:** If an object covers equal distances in equal intervals of time, its motion is said to be uniform. A car moving on a straight highway with no traffic is an example of uniform motion.

Non-uniform motion: If an object covers unequal distances in equal interval of time, its motion is said to be non-uniform. A car moving in a traffic is an example of nonuniform motion.

7. In uniform motion, object covers equal distances in equal intervals of time. Hence, the speed of an object remains constant throughout the motion.

Time (s)	0	10	20	30	40	50	60	70
Distance (m)	0	8	16	24	32	40	48	56

The object covers 8 m in every 10 seconds. Hence, the speed of an object remains constant at 0.8 m/s throughout the motion.

8. Distances in equal intervals (hours) are not the same (60, 70, 50 km). Hence, the motion of the car is non-uniform.
9. In our daily life, most motions are non-uniform.

Examples:

- A bus moving through city traffic.
- A person walking on a crowded road.
- A cyclist slowing down at turns and speeding up on straight paths.

10. The object exhibits non-uniform motion, because it covers unequal distances in equal time intervals.

Average speed: Total distance = 60 m,
Total time = 100 s

$$\text{Average speed} = \frac{60}{100} = 0.6 \text{ m/s}$$

11. Step 1: Time for first 500 m

$$t_1 = \frac{500}{10} = 50 \text{ s}$$

Step 2: Time for next 500 m

$$t_2 = \frac{500}{5} = 100 \text{ s}$$

Step 3: Time left for remaining 1000 m

$$t_3 = 200 - (50 + 100) = 50 \text{ m/s}$$

Step 4: Speed for remaining 1000 m

$$v_3 = \frac{1000}{50} = 20 \text{ s}$$

Step 5: Average speed

Total distance = 2000 m, Total time = 200 s

$$\text{Average speed} = \frac{2000}{200} = 10 \text{ m/s}$$

YOUR ASSIGNMENT

I. Multiple Choice Questions:

- (b) Atomic clock
- (b) The length of the string

IV. Match the Columns A and B:

Column A	Column B
(a) Ghatika-Yantra	4. Bowl clock that sank in water
(b) Pendulum clock	1. Christian Huygens
(c) Speed	5. Distance / Time
(d) Sundial	2. Shadow-based time device
(e) Hourglass	3. Flow of sand between bulbs

V. Very Short Answer Type Questions:

- Second (s)
- Atomic clock
- Varahamihira
- It oscillates periodically.
- Time period
- Pendulum motion
- Distance covered per unit time

- (c) Christiaan Huygens
- (b) m/s
- (c) Periodic repetition
- (b) Quartz clocks
- (c) Distance / Time

II. Fill in the Blanks:

- second
- small
- 1656
- shadow
- time
- Ghatika-Yantra
- simple

III. True/False:

- False
- False
- True
- True
- True
- False
- True

VI. Life Skills/Skill-Based Questions:

- Measure 10 pendulum swings with a stopwatch, divide total time by 10 for the time period; this shows that each swing takes about the same time, illustrating constant time period.
- Calculate average speed from distance and time (Speed = Distance ÷ Time); knowing your speed helps schedule trips efficiently and arrive safely.

VII. Assertion-Reason Based Questions:

1. (c) Assertion is true, but Reason is false.
2. (a) Both A and R are true, and R is the correct explanation of A.
3. (d) Assertion is false, but Reason is true.

VIII. Picture Based Question:

- (d) The current speed

IX. Case Study Based Questions:

1. (a) By measuring the time it took for one complete swing using a stopwatch.
2. (b) To plan her journey better and avoid being late.

Chapter 9. Life Processes in Animals

NCERT CORNER

1. Food → Mouth → Oesophagus (Food pipe) → Stomach → Small intestine → Large intestine → Anus
2. (i) Test Tube A (Chapati): Turns blue-black - indicates the presence of starch.
(ii) Test Tube B (Chewed Chapati): Shows little or no blue-black colour- because saliva has partially converted starch into sugar.
(iii) Test Tube C (Boiled Potato): Turns blue-black- boiled potato also contains starch.
Reason: Iodine gives a blue-black colour when it reacts with starch. In the chewed sample, saliva breaks down starch into sugar, so colour change is less or absent.
3. (iii) To help in inhalation and exhalation
4. Match the following

Name of the part	Functions
(i) Nostrils	(a) fresh air from outside enters
(ii) Nasal passages	(b) exchange of gases occurs
(iii) Windpipe	(c) protects lungs
(iv) Alveoli	(d) tiny hair and mucus help to trap dust and dirt from the
(v) Ribcage	(e) air we breathe reaches our lungs through this part

Ans. (i) – (d), (ii) – (a), (iii) – (e), (iv) – (b), (v) –

(c)

5. Sanvi may ask Anil the following questions:
 - Does breathing only involve taking in and giving out air, or does it also include energy release?
 - If breathing and respiration were the same, how does our body get energy from food?
 - Do you know where in the body oxygen actually helps to release energy?

These questions will help Anil realize that breathing is just the physical process of taking in air and releasing it, while respiration is a chemical process that happens inside our body to produce energy.

6. **Correct statement: Tanu:** We inhale air rich in oxygen. The air around us contains 21% oxygen, 78% nitrogen, and small amounts of other gases. Hence, we inhale air rich in oxygen, not pure oxygen.
7. When we inhale a lot of dust-laden air, tiny hair and mucus in our nasal passages trap dust and dirt. When too much dust enters, the nasal lining gets irritated. The body's natural response is to sneeze, which helps to expel dust and harmful particles from the nose. Sneezing thus helps protect the respiratory system from infection and damage.
8. Two possible explanations could be:
 - (i) Anusha might have lower stamina or be less used to exercise, leading to

faster breathing.

- (ii) Anusha's body needed more oxygen to supply energy to her muscles after running.
9. Yadu wants to test the action of saliva on starch.
- **Test Tube A:** Contains starch; turns blue-black with iodine.
 - **Test Tube B:** Contains saliva; starch is broken down into sugar, so no blue-black colour appears.
 - This shows that saliva helps digest starch into simple sugars during digestion.
10. Rakshita is trying to find out the difference between inhaled and exhaled air, particularly the presence of carbon dioxide.
- When exhaled air is passed into lime water (test tube B), it turns milky, showing the presence of more carbon dioxide.
 - Inhaled air in test tube A does not turn lime water milky.
 - Therefore, she confirms that exhaled air contains more carbon dioxide than inhaled air.

YOUR ASSIGNMENT

IV. Match the Columns A and B:

Column A	Column B
(a) Saliva	5. Breaks down starch
(b) Gizzard	2. Helps in chewing in birds
(c) Rectum	4. Stores waste before egestion
(d) Large Intestine	1. Absorbs water and salts
(e) Small Intestine	3. Contains villi for absorption

V. Very Short Answer Type Questions:

1. To carry food from the mouth to the stomach.
2. Saliva
3. Liver

I. Multiple Choice Questions:

1. (d) Stomach
2. (b) Neutralises stomach acid and breaks down fats
3. (d) Small intestine
4. (b) Wave-like muscle movements
5. (c) Bile
6. (d) Large intestine
7. (c) Digestion

II. Fill in the Blanks:

1. Saliva
2. villi
3. wave-like
4. rectum
5. Celiac disease
6. anus
7. digestive

III. True/False:

1. False
2. False
3. True
4. False
5. True
6. False
7. True

4. Process of bringing back partially digested food for chewing in ruminants.
5. Egestion
6. Proteins
7. Digestion of fibre and production of

nutrients.

VI. Life Skills/Skill-Based Questions:

1. A healthy chart includes rice and bread (carbohydrates), eggs and pulses (proteins), nuts (fats), and fruits/vegetables (vitamins); these nutrients fuel digestion, build the body, and support life functions like circulation and respiration.
2. Practising deep breathing daily improves lung capacity, helps relax the body, and promotes the efficient exchange of oxygen and carbon dioxide, making breathing easier and healthier.

VII. Assertion-Reason Based Questions:

1. (c) Assertion (A) is true, but Reason (R) is false.
2. (c) Assertion (A) is true, but Reason (R) is false.
3. (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

VIII. Picture Based Question

(c) Alveoli

IX. Case Study Based Questions:

1. (c) Small intestine
2. (b) It helps exchange oxygen and carbon dioxide in the lungs

Chapter 10. Life Processes in Plants

NCERT CORNER

1

Sl. No.	Feature	Photosynthesis	Respiration
1.	Raw materials	Carbon dioxide and water (in the presence of sunlight and chlorophyll)	Glucose and oxygen
2.	Products	Glucose and oxygen	Carbon dioxide, water, and energy
3.	Word equation	Carbon dioxide + Water $\rightarrow$ (Sunlight/Chlorophyll) $\rightarrow$ Glucose + Oxygen	Glucose + Oxygen $\rightarrow$ Carbon dioxide + Water + Energy
4.	Importance	Provides food (energy source) and oxygen for all living organisms	Releases energy required for life processes

2. If all the organisms that carry out photosynthesis disappeared, food and oxygen would no longer be produced. Animals and humans would not get food or oxygen to survive, and carbon dioxide would keep increasing in the air. Life on Earth would gradually come to an end. Therefore, photosynthetic organisms are essential for maintaining life and the balance of gases on Earth.
3. The starch in potatoes comes from the food prepared in the leaves through photosynthesis. The food made in leaves is transported to other parts of the plant through phloem, where it is stored in the form of starch, such as in the potato.
4. Yes, the broad and flat structure of leaves makes plants more efficient for photosynthesis. A larger surface area allows the leaves to absorb more sunlight and take in more carbon dioxide. This helps the plant to prepare more food in a shorter time, making photosynthesis

faster and more effective.

5. X – Glucose Y – Oxygen Z – Water
6. (i) Through this experiment, she is testing whether sunlight is necessary for photosynthesis in plants or not.
(ii) The plant kept in sunlight remains green and healthy, while the plant kept in the dark turns yellow and shows no growth.
(iii) The leaves of the plant kept in sunlight will confirm the iodine test for starch because photosynthesis occurs only in the presence of sunlight.
7. (i) Starch will be formed in (a) Sunlight with carbon dioxide.
(ii) Starch will not be formed in (b) Sunlight without carbon dioxide, (c) Dark with carbon dioxide, and (d) Dark without carbon dioxide.
(iii) Oxygen will be generated in (a) Sunlight with carbon dioxide
(iv) Oxygen will not be generated in (b) Sunlight without carbon dioxide, (c) Dark with carbon dioxide, and (d) Dark without carbon dioxide.
8. Ananya wants to find out how plants and animals affect the amount of carbon dioxide in water. She is testing the role of respiration and photosynthesis. The carbon dioxide indicator changes colour depending on how much carbon dioxide is present in the water.
(i) Test Tube A (Snail only): The indicator will turn yellow/orange, showing CO_2 level increases due to the snail's respiration.
(ii) Test Tube B (Plant only): The indicator will turn blue/purple, showing CO_2 level decreases because the plant uses it during photosynthesis.
(iii) Test Tube C (Snail + Plant): The colour may stay neutral or slightly blue,

showing CO_2 level remains balanced because CO_2 released by snail is used by the plant.

- (iv) Test Tube D (Only water): No colour change, as there is no living organism to add or remove CO_2 .

9. Experiment:

- (i) Take two similar potted plants or leafy stems and place each in a beaker containing coloured water (e.g., red ink).
- (ii) Keep one set in warm conditions (sunlight) and the other in cold conditions (shade or refrigerator).
- (iii) After a few hours, cut the stems and observe how far the coloured water has travelled.

Observation:

- The coloured water moves higher in the stem kept in warm conditions than in the cold one.

Conclusion:

- Water transportation is quicker in warm conditions, as warmth increases the rate of transpiration and movement through the xylem.

10. Photosynthesis and respiration are complementary processes that help maintain balance in nature. During photosynthesis, plants take in carbon dioxide and release oxygen, while in respiration, living beings use oxygen and release carbon dioxide. These opposite processes keep the amount of oxygen and carbon dioxide in the atmosphere balanced and support life on Earth.

YOUR ASSIGNMENT

I. Multiple Choice Questions:

1. (c) Chlorophyll
2. (b) Starch
3. (c) Oxygen

4. (c) Xylem
5. (b) Starch
6. (c) They do not produce starch
7. (d) Phloem

II. Fill in the Blanks:

1. photosynthesis
2. chlorophyll
3. water
4. glucose
5. Leaf

6. xylem
7. iodine

III. True/False:

1. False
2. True
3. False
4. False
5. True
6. True
7. False

IV. Match the Columns A and B:

Column A	Column B
(a) Chlorophyll	4. Present in green leaves
(b) Xylem	3. Upward transport of water and minerals
(c) Phloem	1. Carries food to all parts
(d) Iodine	2. Blue-black colour test
(e) Glucose	5. Product of photosynthesis

V. Very Short Answer Type Questions:

1. Chlorophyll
2. Photosynthesis
3. Carbon dioxide
4. Glucose
5. Iodine test
6. Phloem
7. Leaf

and respiration so they can grow and stay healthy.

VII. Assertion-Reason Based Questions:

1. (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).
2. (d) Assertion (A) is false, but Reason (R) is true.
3. (c) Assertion (A) is true, but Reason (R) is false.

VI. Life Skills/Skill-Based Questions:

1. Sunlight, water, and air help a plant stay green and healthy by supporting photosynthesis, where the plant makes food, grows, and carries out other processes needed for life.
2. Care for plants by watering, providing sunlight, and protecting from pests; these actions help plants do photosynthesis

VIII. Picture Based Question:

- (a) Only Part A

IX. Case Study Based Questions:

1. (b) Water, carbon dioxide, sunlight, and chlorophyll
2. (c) Stomata

Chapter 11. Light: Shadows and Reflections

NCERT CORNER

1. Sun (because it produces its own light)
2. (a) – (iii), (b) – (i), (c) – (iv), (d) – (ii)

3. Only Rekha can see the flame of the candle because light travels in a straight line and cannot bend around obstacles. Rekha's line of sight is aligned with the

flame. The others cannot see the flame because they are not in the path of the pipe where the flame is visible.

4. Shadows form when light is blocked and always appear on the side away from the light source. If the light is coming from above, the shadow will fall below. If the light comes from the side, the shadow will be cast in the opposite direction. Thus, option (d) is the correct image showing the shadow formation of the boy.
5. In scenario (i), the ball is closer to the torch and away from the wall, so the shadow would be large and blurry on the wall. So the correct representation of scenario (i) will be (b). In scenario (ii), the ball is closer to the wall and away from the torch, so the shadow would be sharp and small. So the correct representation of scenario (ii) will be (a).
6. (a) – (ii), (b) – (i), (c) – (iv), (d) – (iii)
7. The image of the tree seen through the pinhole camera will be inverted (upside down). Light travels in straight lines through the small pinhole, crossing over to form an inverted image on the screen.

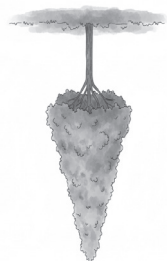
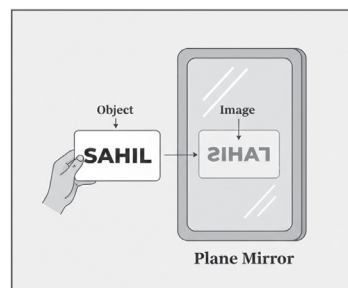


Image of the tree formed in the pinhole camera

8. When you hold the paper with your name written in front of a plane mirror, the letters appear reversed, the right side becomes the left side. This reversal is called lateral inversion. It happens because the image formed in a plane mirror is laterally inverted, i.e., left appears right and right appears left.



9. Observations:

- At 9 AM → Long shadow
 - At 12 PM → Shortest shadow
 - At 4 PM → Long shadow again
- (i) The shadow will be shortest at 12 PM when the Sun is directly overhead.
 - (ii) This happens because the Sun is directly overhead at noon, so light falls vertically, making the shadow very short.
10. (i) Both statements are true. Plane mirrors create a laterally inverted image (left to right is reversed), and some alphabets like T and O appear the same in a plane mirror.
 11. Yes, the tube can be used to make a periscope. The mirrors should be placed at a 45° angle inside the tube, facing each other, to reflect light through the tube and give us a view from above or around an obstacle.
 12. This happens because the Sun's rays are coming from a high angle when the bird is flying high in the sky, it is far from the ground, so its shadow becomes too faint and scattered to be visible. When the bird flies close to the ground, the light rays are partially blocked, forming a visible shadow. The closer an object is to the surface, the sharper and darker its shadow appears.

YOUR ASSIGNMENT**I. Multiple Choice Questions:**

1. (c) Sun
2. (d) Straight line
3. (b) Mirror
4. (b) Inverted image
5. (c) Plane mirrors
6. (c) Consume less power and last longer
7. (b) Virtual and upright

II. Fill in the Blanks:

1. straight
2. non-luminous

3. luminous
4. periscope
5. inverted
6. shiny
7. Lateral

III. True/False:

1. True
2. False
3. False
4. False
5. False
6. True
7. True

IV. Match the Columns A and B:

Column A	Column B
(a) LED lamp	3. Energy-efficient
(b) Pinhole camera	2. Inverted image
(c) Mirror	1. Reflected light
(d) Shadow	5. Formed on a screen
(e) Opaque object	4. No light passes

V. Very Short Answer Type Questions:

1. Sun
2. An object that emits its own light.
3. Straight line
4. It helps to see objects that are not directly visible.
5. A dark patch formed when light is blocked by an opaque object.
6. The left appears right and right appears left in a mirror image.
7. Inverted and real.

glare; understanding reflections aids in grooming and proper room lighting, making daily tasks easier.

VII. Assertion-Reason Based Questions:

1. (c) Assertion (A) is true, but Reason (R) is false.
2. (d) Assertion (A) is false, but Reason (R) is true.
3. (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

VI. Life Skills/Skill-Based Questions:

1. Glass is transparent, plastic and paper are translucent, and wood is opaque; knowing this helps arrange objects at home for better natural lighting and shade where needed.
2. Mirrors should be placed to reflect light where helpful but not cause

VIII. Picture Based Question:

- (d) Inverted and same size

IX. Case Study Based Questions:

1. (c) Cardboard box
2. (c) The image is of the same size but laterally inverted

Chapter 12. Earth, Moon, and the Sun

NCERT CORNER

1. During one rotation of the Earth, the North and South Poles receive either 0 or 24 hours of sunlight, depending on the season due to the Earth's axial tilt. In the given figure, the North Pole is in darkness, which means it is winter in the Northern Hemisphere. During this time, the North Pole receives 0 hours of sunlight, while the South Pole, experiencing summer, receives 24 hours of sunlight during one rotation of the Earth.
2. (i) east, west (ii) rotation (iii) total
3. (i) False (ii) False
(iii) True (iv) False
(v) False
4. Padmashree saw the Orion constellation nearly overhead at 8 p.m. yesterday. She will see Orion overhead about four minutes earlier each successive night because the Earth completes one rotation in approximately 23 hours and 56 minutes, not a full 24 hours. Therefore, today she will see the Orion constellation overhead at around 7:56 p.m.
5. Nandhini saw a group of stars rising at midnight on 21 June. Since the Earth takes one complete year (365 days) to revolve around the Sun, the same group of stars will again appear in the same position at the same time after one year. Thus, she will see the same group of stars rising at midnight again on 21 June next year.
6. This happens because the Earth rotates from west to east, so different parts of the Earth face the Sun at different times. When it is day in India, that side of the Earth is facing the Sun, while the opposite side, where the USA is located, is facing away from the Sun, resulting in night-time there.
7. Aditya was being careless because he watched the solar eclipse directly with his eyes. Looking at the Sun directly, even during an eclipse, can severely damage

the eyes and may cause permanent blindness.

8. **For Solar eclipse:** The order is Sun, Moon, Earth. (The Moon comes between the Sun and the Earth, blocking sunlight.)
For Lunar eclipse: The order is Sun, Earth, Moon. (The Earth comes between the Sun and the Moon, blocking sunlight from reaching the Moon.)
9. The moon can block the sun completely during a total solar eclipse because of their relative distances and sizes. Although the Moon is 400 times smaller than the sun, it is also about 400 times closer to the earth. Due to this perfect ratio both appear almost the same size in the sky, allowing the moon to cover the sun completely and cause a total solar eclipse.
10. The Indian cricket team should pack summer clothes for their trip to Australia in December. In December, the Southern Hemisphere (where Australia is located) is tilted towards the Sun, experiencing summer, while the Northern Hemisphere (including India) experiences winter.
11. A lunar eclipse can be seen from a much larger part of the Earth because, during this event, the Earth's shadow falls on the Moon and covers a vast area that includes almost the entire night side of the Earth. Therefore, anyone who can see the Moon at that time can observe the lunar eclipse. In contrast, a total solar eclipse can only be seen from a small part of the Earth because the Moon's shadow covers only a small area on the Earth's surface, and only those within that area can witness the total solar eclipse.
12. If the Earth's axis were not tilted with respect to the axis of its revolution around the Sun, there would be no change in the amount of sunlight received by different parts of the Earth throughout the year. As a result, there would be no distinct seasons such as summer, winter, spring, or autumn. The tilt of the Earth's axis is,

therefore, responsible for the seasonal changes and the variation in daylight hours that we observe.

YOUR ASSIGNMENT

I. Multiple Choice Questions:

1. (c) West to East
2. (c) Rotation of the Earth
3. (d) 24 hours
4. (c) 21 June
5. (b) Pole Star
6. (b) Earth's tilt and revolution
7. (c) Earth's rotation

II. Fill in the Blanks:

1. axis
2. orbit
3. east, west
4. revolution
5. 12, 12
6. Moon
7. rotation

III. True/False:

- | | |
|----------|----------|
| 1. False | 2. False |
| 3. True | 4. True |
| 5. False | 6. True |
| 7. False | |

IV. Match the Columns A and B:

Column A	Column B
(a) Rotation of Earth	3. Causes day and night
(b) Revolution of Earth	5. Change of seasons
(c) Solar Eclipse	4. Moon comes between Sun and Earth
(d) Lunar Eclipse	1. Earth comes between Sun and Moon
(e) Axis of Earth	2. Imaginary line tilted at 23.5°.

V. Very Short Answer Type Questions:

1. About 24 hours
2. From West to East
3. Axis of rotation
4. Movement of the Earth around the Sun
5. The tilt of the Earth's axis and its revolution around the Sun
6. Summer Solstice
7. Leon Foucault

Earth's tilted axis, keep people safe and comfortable throughout the year.

VII. Assertion-Reason Based Questions:

1. (c) Assertion (A) is true, but Reason (R) is false.
2. (a) Both A and R are true, and R is the correct explanation of A.
3. (d) Assertion (A) is false, but Reason (R) is true.

VI. Life Skills/Skill-Based Questions:

1. Recording sunrise and sunset times shows how day length changes; this knowledge, linked to Earth's rotation, helps plan routines to match daylight hours for activities and safety.
2. In summer, wear light, loose clothes; in winter, use warm layers. These habits, based on season changes caused by

VIII. Picture Based Question:

(c) West to East

IX. Case Study Based Questions:

1. (b) The Earth's rotation on its axis from West to East
2. (b) Because the Earth's axis is tilted and it has a spherical shape

