Chapter 8: A Journey through States of Water

Exercises — Let Us Enhance Our Learning

Q1 Which of the following best describes condensation?
(i) The conversion of water into its vapour state.
(ii) The process of water changing from a liquid into gaseous state.
(iii) The formation of clouds from tiny water droplets.
(iv) The conversion of water vapour into its liquid state.

SOLUTION

Condensation is the process by which water vapour (gas) changes into liquid water.
Option (i) describes evaporation — water changing to vapour.
Option (ii) also describes evaporation — liquid changing to gas.
Option (iii) describes cloud formation, which is a result of condensation but not its definition.
Option (iv) correctly states: the conversion of water vapour into its liquid state — this is condensation.

Answer: (iv) The conversion of water vapour into its liquid state.

Q2 Identify in which of the given processes, evaporation is very important—
(i) Colouring with (a) crayons (b) water colours (c) acrylic colours (d) pencil colours
(ii) Writing on paper with (a) pencil (b) ink pen (c) ball point pen

SOLUTION

Evaporation is important when a liquid carrier (water or solvent) needs to dry away after use.
(i) Colouring: Water colours use water as the carrier — the water must evaporate for the colour to dry and fix on paper. So evaporation is very important for (b) water colours.
Crayons, pencil colours, and acrylic colours (once dry on the palette, acrylic uses water but dries mainly by evaporation and film-formation; however among the options given, water colours is the clearest answer for Class 6).
(ii) Writing: Ink pens use liquid ink — the ink's liquid component evaporates, leaving the coloured pigment on paper. So evaporation is very important for (b) ink pen.

Pencil and ball point pen do not rely on evaporation to leave a mark.

Answer: (i) Water colours — (b); (ii) Writing with ink pen — (b).

Q3 We see green coloured plastic grass at many places these days. Space around natural grass feels cooler than space around the plastic grass. Can you find out why?

SOLUTION

Natural grass contains water. Water evaporates continuously from the surface of natural grass leaves.

Evaporation requires heat energy, which it takes from the surroundings. This removal of heat cools the air around natural grass.

Plastic grass has no water and does not evaporate anything. No heat is absorbed from the surroundings, so the area around plastic grass does not get cooled.

Therefore, the space around natural grass feels cooler than the space around plastic grass.

Answer: Natural grass evaporates water continuously, absorbing heat from surroundings and causing a cooling effect. Plastic grass cannot evaporate, so no cooling occurs around it.

Q4 Give examples of liquids other than water that evaporate.

SOLUTION

Many liquids evaporate, just like water.

Examples of liquids that evaporate:

1. Hand sanitiser — disappears quickly when rubbed on hands (as mentioned in the chapter).
2. Petrol — evaporates rapidly; you can smell it near a petrol pump.
3. Alcohol / spirit — evaporates fast; used to clean wounds.
4. Nail polish remover (acetone) — evaporates quickly with a strong smell.
5. Perfume / cologne — evaporates from skin, releasing fragrance.

Answer: Hand sanitiser, petrol, alcohol, nail polish remover, perfume — these are liquids other than water that evaporate.

Q5 Fans move air around, creating a cooling sensation. It might seem strange to use a fan to dry wet clothes since fans usually make things cooler, not warmer. Normally, when water evaporates, it requires heat, not cold air. What do you think about this?

SOLUTION

A fan does not lower the temperature of the air; it moves air around.
When air moves over a wet surface, it carries away the water vapour that has just evaporated, allowing fresh dry air to take its place.
This movement of air speeds up evaporation because it prevents the air near the wet surface from becoming saturated with water vapour.
Faster evaporation means the water in wet clothes is removed more quickly — so the clothes dry faster.
The cooling sensation we feel is because evaporation absorbs heat from our skin.
The fan aids this by moving away the moist air and bringing drier air.
So a fan helps dry clothes not by providing heat, but by increasing air movement, which speeds up evaporation.

Answer: A fan speeds up evaporation by moving air and carrying away water vapour, allowing faster drying. The fan provides air movement, not heat, but air movement is a key factor that increases the rate of evaporation.

Q6 Usually, when sludge is removed from drains, it is left in heaps next to the drain for 3–4 days. Afterward, it is transported to a garden or a field where it can be used as manure. This approach reduces transportation cost of the sludge and enhances the safety of individuals handling it. Reflect upon it and explain how.

SOLUTION

Fresh sludge from drains contains a large amount of water, making it very heavy and difficult to transport.
By leaving the sludge in heaps for 3–4 days, the water in the sludge evaporates into the air.
As water evaporates, the sludge becomes drier and much lighter.
Lighter sludge is cheaper and easier to transport — this reduces transportation cost.
Fresh wet sludge gives off foul odours and its liquid content makes it unpleasant and harder to handle safely.
After drying for 3–4 days, much of the foul-smelling moisture evaporates. The

dried sludge is less odorous and easier to handle safely.
The dried sludge can then be used as manure in gardens or fields.

Answer: Leaving sludge for 3–4 days allows water to evaporate, making it lighter (reducing transport cost) and drier/safer (reducing harmful germs and odours for handlers).

Q7 Observe the activities in your house for a day. Identify the activities that involve evaporation. How does understanding the process of evaporation help us in our daily activities?

SOLUTION

Activities at home that involve evaporation:
1. Drying wet clothes — water evaporates from clothes left in sun or under a fan.
2. Mopping the floor — water on the mopped floor evaporates after some time.
3. Cooking — water evaporates from boiling dal, rice, or vegetables.
4. Sweating — sweat on our skin evaporates, keeping us cool.
5. Drying washed utensils — water on the surface of utensils evaporates.
6. Using hand sanitiser — sanitiser evaporates quickly from hands.

How understanding evaporation helps us:
- We spread clothes wide to increase exposed area and dry them faster.
- We dry clothes in the sun or near a fan to speed up evaporation.
- On a humid (rainy) day, we know clothes will take longer to dry.
- We use evaporative cooling (sprinkle water on the floor/roof in summer) to cool our homes.
- We use an earthen pot (matka) knowing that water seeping and evaporating from it keeps the stored water cool.

Answer: Activities: drying clothes, mopping floors, cooking, sweating, drying utensils. Understanding evaporation helps us dry clothes faster (sunlight, fan, spread wide), keep cool in summer (sweating, sprinkling water), and use earthen pots for cooling.

Q8 How is water present in the solid state in nature?

SOLUTION

Water exists in the solid state in nature in several forms:

1. Ice — water freezes to form ice when temperature drops below 0°C.
2. Glaciers — large masses of ice found on mountains and polar regions.
3. Snow — frozen water vapour that falls from clouds as snowflakes.
4. Hail — chunks of ice that fall from clouds under special conditions (mentioned in the chapter).
5. Polar ice caps — vast sheets of ice at the North and South Poles.

As stated in the chapter: 'Under special conditions, it might also fall as hail or snow.'

Answer: Water is present in the solid state as ice (in freezers, glaciers, polar ice caps), snow (falling from clouds), and hail (ice chunks falling from clouds under special conditions).

Q9 Reflect on the statement "Water is our responsibility before it is our right." Share your thoughts.

SOLUTION

The chapter states: 'Only a small portion of water available on the Earth is fit for use by plants, animals and humans. Most of the water is in the oceans and cannot be used directly.'

It also says: 'The increasing demand for water causes its shortage in many parts of the world. Hence, it is very important to use water wisely and avoid wasting it.'

Reflection:

We often think of water as something we are entitled to use as much as we want. But water is a limited resource.

Being responsible means: not wasting water, keeping water bodies free from pollution, and using water wisely.

Only when we take responsibility to conserve water can we ensure everyone has the right to access clean water.

If we do not protect and conserve water, future generations may not have enough clean water to meet their basic needs.

So our responsibility to care for water must come before claiming it as a right.

Answer: Water is a limited resource. We must use it wisely, avoid wasting it, and keep water bodies clean. Taking responsibility to conserve water ensures that the right to water is available to all — now and in the future.

Q10 The seat of a two-wheeler parked on a sunny day has become very hot. How can you cool it down?

SOLUTION

The chapter explains that evaporation causes a cooling effect.

Examples from the chapter: 'Sprinkling water on the floor or the roof during summer to cool it' and water evaporating from an earthen pot cools the water inside.

To cool the hot seat: Pour or sprinkle some water on the seat.

The water will absorb heat from the hot seat surface as it evaporates.

This removes heat from the seat and cools it down quickly.

You can also spread the water and use a cloth to wipe — the evaporation from the wet surface will cool it further.

Air movement (blowing or fanning) will speed up evaporation and cool it faster.

Answer: Sprinkle or pour water on the hot seat. As the water evaporates, it absorbs heat from the seat surface and cools it down — the same cooling effect seen when water is sprinkled on a hot floor or roof.