

SCIENCE • CLASS 9

CHAPTER 3

Tissues in Action

NCERT SOLUTIONS



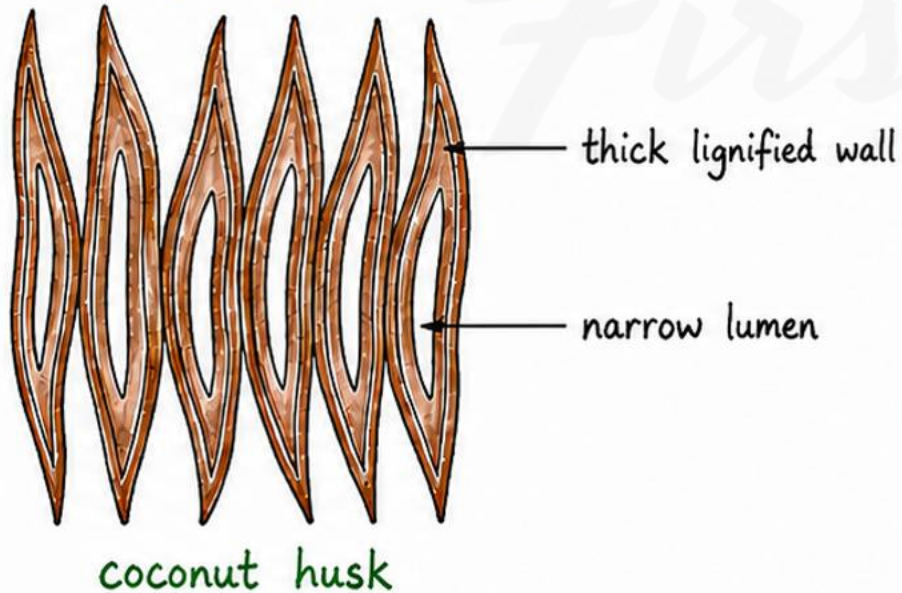
HARD FIBRES AND FLEXIBLE STALKS

Pause and Ponder – Question 1

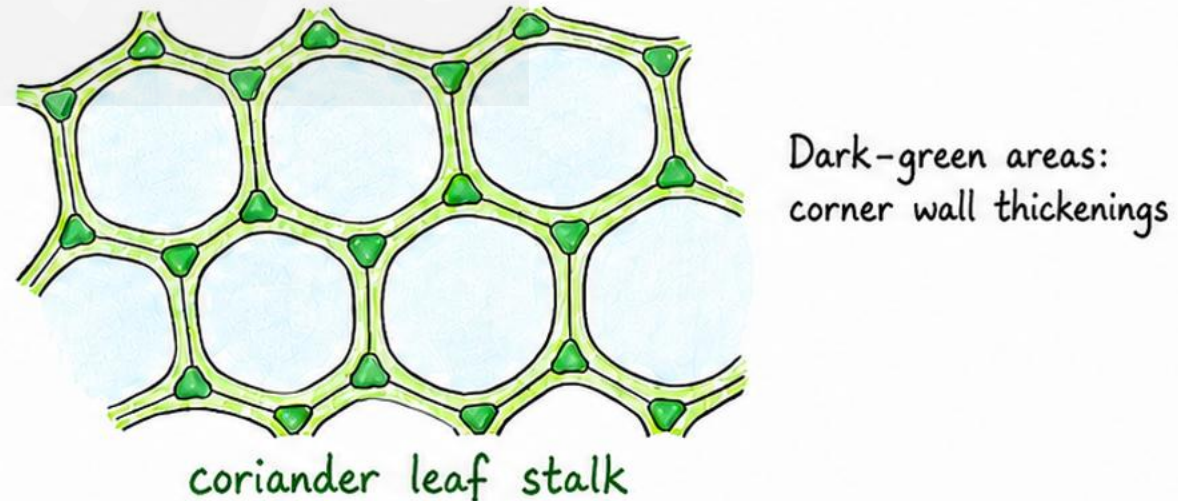
Question: You may have noticed that fibres of coconut husk are hard and brittle, whereas the leaf stalks of coriander are soft and flexible. Find out the reason.

Solution:

Coconut husk: Sclerenchyma fibres have very thick, lignified cell walls. Mature fibres are dead and give great strength and stiffness.



Coriander leaf stalk: Living collenchyma cells have walls unevenly thickened at the corners. They support the stalk while allowing it to bend. Thin-walled parenchyma also makes the stalk soft.



Answer: Different supporting tissues give different mechanical properties.

CUTICLE IN DIFFERENT HABITATS

Pause and Ponder - Question 2

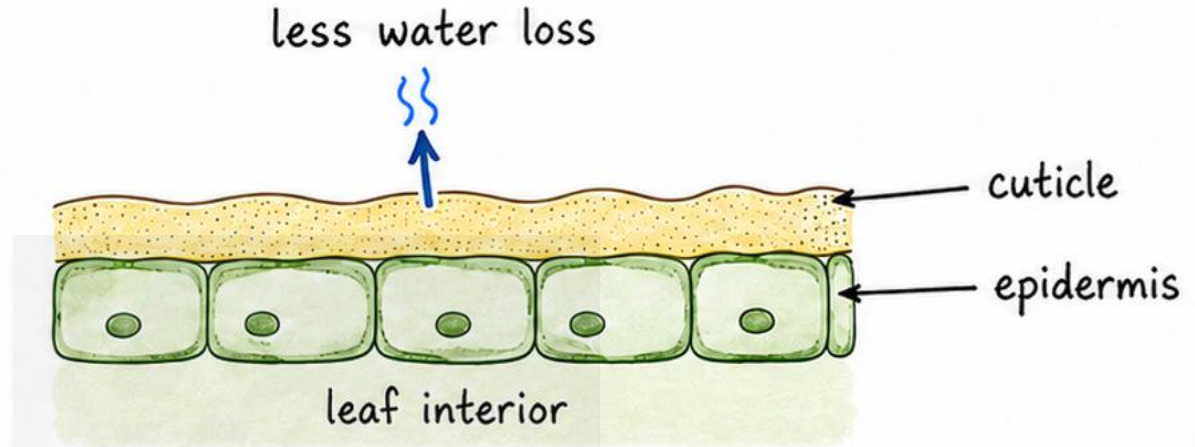
Question: Why do you think that a thick cuticle on the outer wall of the epidermis is advantageous for a plant living in the desert but disadvantageous for a plant living underwater?

Solution:

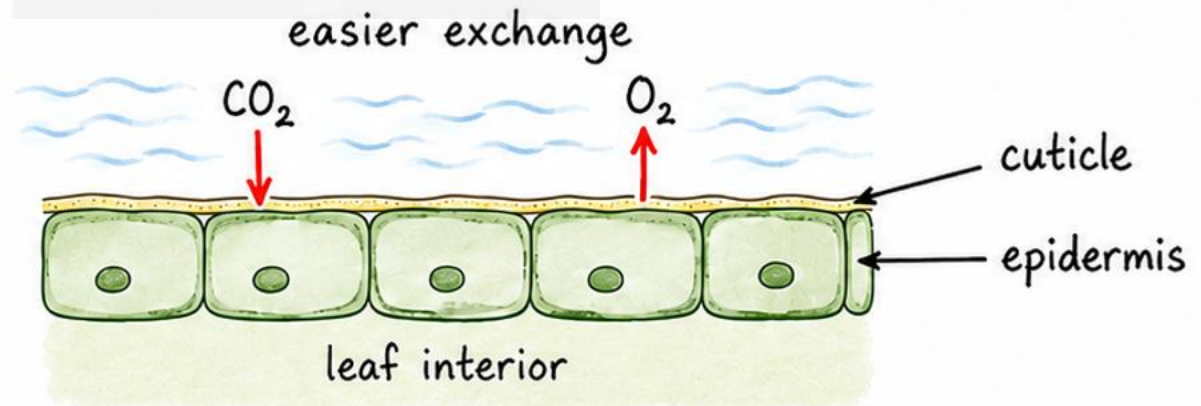
- **Desert plant:** Water is scarce. The thick, waxy cuticle reduces evaporation from the plant surface and helps prevent drying.
- **Submerged plant:** Water is abundant. A thick, water-resistant cuticle would slow the exchange of dissolved gases and other substances through the surface.

Answer: A thick cuticle conserves water on land, but hinders useful surface exchange underwater.

1. Desert plant (leaf surface)



2. Submerged plant (leaf surface)



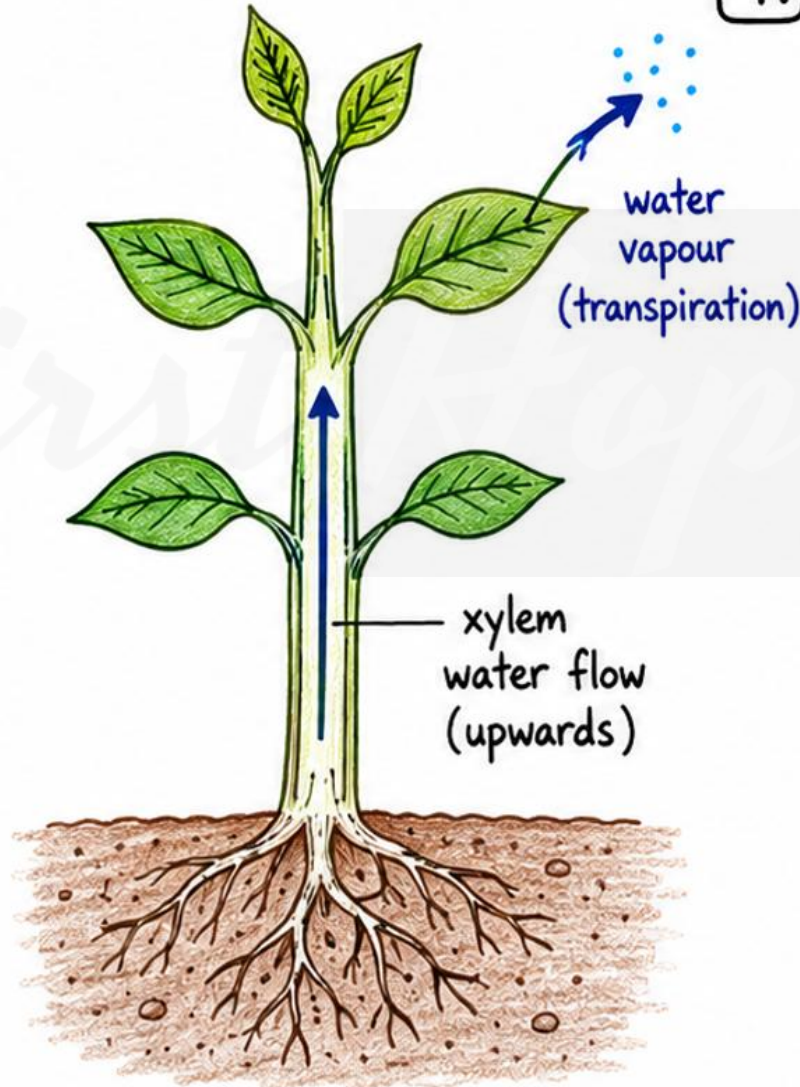
XYLEM, STOMATA AND WATER MOVEMENT

Pause and Ponder - Questions 3 and 4

3. Once water is absorbed by plant roots, it has to travel against gravity through xylem. How do the 'dead' cells of the xylem work together with the living cells of leaves at the top to keep the water moving?

Solution:

- Dead xylem vessels and tracheids form strong, hollow pathways.
- Water evaporates from living leaf cells and leaves through stomata.
- This creates a transpiration pull that draws a continuous water column upwards.
- Living guard cells regulate stomatal openings.



4. What do you think will happen if there were no stomata in the epidermis of the stem or leaves?

Solution:

- In a typical land plant, gas exchange and transpiration would fall greatly.
- Less carbon dioxide would enter for photosynthesis.
- Transpiration pull, mineral transport and cooling would weaken.
- Growth would suffer.

JOINTS USED IN DANCE

Pause and Ponder - Question 5



Question: Carefully observe the various poses of classical and folk dances of India shown in the chapter. Can you identify which joints are involved? What type of movement does each joint allow?

Solution:

1. Shoulders and hips	ball and socket joints: move limbs forwards, backwards, sideways and in circular movements.
2. Elbows and knees	hinge joints: mainly bend and straighten in one plane.
3. Ankles	hinge action: move the foot up and down.
4. Upper neck	pivot joint between the first two vertebrae: turns the head from side to side.
5. Finger joints	hinge joints: bend and straighten fingers to make hand gestures.
6. Wrist joints	help bend the hand and move it sideways.



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