Why Sunflowers Droop

Trace how cells and larger plant parts work together.

L.6.1 "Students will demonstrate an understanding that living things range from simple to complex organisms, are organized hierarchically, and function as whole living systems..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline an example of each level of organization, circle the cell parts that help a leaf stay firm, and number the steps that explain why leaves droop during a dry spell.

A Sunflower After Rain

1. A sunflower on a hot day may droop, then stand taller after rain. To explain this change, begin with its cells. Each plant cell has a firm cell wall outside a cell membrane, which controls what enters and leaves. A large vacuole stores water and helps keep the cell firm. Chloroplasts use sunlight to help the cell make food, while mitochondria release energy the cell can use. A nucleus directs many cell activities. These parts work together to keep each cell alive, but a sunflower needs more than one cell.

2. In a sunflower, groups of cells work together in tissues. Vascular tissue moves water through the plant, including from the roots toward the leaves. Each leaf is an organ made of several tissues. Leaves join stems and flowers in the shoot system, an organ system. Roots belong to the root system. The two systems together form the whole sunflower, a multicellular organism. This chain, cells, tissues, organs, organ systems, organism, is a model of increasing complexity. Each level depends on the smaller levels inside it.

3. After days without rain, roots may take in too little water to replace what the leaves lose. Less water reaches the vacuoles in leaf cells, so those cells become less firm and the leaves droop. When rain soaks the soil, roots can take in more water, and vascular tissue carries it toward the leaves. Water enters leaf cells through their membranes, and their vacuoles fill again. The leaf cells become firmer, helping the leaves stand up. A change in one organ system can affect cells in another system and the whole plant.

2 ANSWER WITH EVIDENCE

Use the passage

1. Write a five-level model from one leaf cell to the whole sunflower. Name an example at each level.

2. Why is a leaf an organ rather than a tissue? Use evidence from the passage.

3. Trace how too little water taken in by the roots can cause a leaf to droop. Include what happens inside its cells.

4. How do a leaf cell's membrane and vacuole help a drooping sunflower stand taller after rain?

3 YOUR TURN

Your own words

Choose a multicellular animal. Write a five-level model from one type of cell to the whole animal, then explain in two sentences how parts of your model work together to meet a need.

ANSWER KEY

Why Sunflowers Droop

GRADE 6 · L.6.1

PART 1 · READ AND MARK

Underline an example of each level of organization, circle the cell parts that help a leaf stay firm, and number the steps that explain why leaves droop during a dry spell. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Write a five-level model from one leaf cell to the whole sunflower. Name an example at each level.	**Leaf cell → tissue in a leaf → leaf → shoot system → sunflower.**
2	Why is a leaf an organ rather than a tissue? Use evidence from the passage.	**A leaf is made of several tissues, so it is an organ rather than one tissue.**
3	Trace how too little water taken in by the roots can cause a leaf to droop. Include what happens inside its cells.	**Too little water reaches the leaf cells. Their vacuoles hold less water, the cells become less firm, and the leaf droops.**
4	How do a leaf cell's membrane and vacuole help a drooping sunflower stand taller after rain?	**Water enters the leaf cell through its membrane. The vacuole fills, helping the cell become firm so the leaf can stand up.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Heart muscle cell → heart muscle tissue → heart → circulatory system → human. Heart muscle cells work together in tissue that helps the heart pump. The circulatory system moves blood through the body to deliver oxygen to cells.

Accept other accurate five-level animal models with a clear connection between levels and a need they meet. For the marking job, students may underline different valid cells or tissues within the sunflower model.