Name: Date:

HANDS-ON LAB

Connecting Form to Function

In this lab you will examine a slice of the roots, stems, and leaves of a plant and describe how their structures relate to their functions.

PREDICT

How do you think the structure of a plant's roots, stems, and leaves will compare? What will differ, and what will be the same?

MATERIALS

- compound microscope
- cover slips (3)
- pipette, plastic disposable
- plant root, stem, and leaf
- razor tool
- slides (3)
- water

PROCEDURE

1. In your Evidence Notebook, draw a table with three labeled columns: name of plant part, sketch, and function. Label three rows: root, stem, and leaf.
2. Carefully use the razor tool to cut a very thin slice from the root, stem, and leaf of the plant. You must be able to see light through the sliced sections. Use caution when using razor blades. Always cut away from your body.
3. Prepare a wet mount slide of a slice of each plant organ. Examine each slide under the microscope and sketch the structures that you see in the table. Describe the function of each structure under the third column.

ANALYZE AND CONCLUDE

1. What similarities did you observe among the slides of the three plant organs? Explain why these similarities might exist.

All of the cell types had cell walls and a nucleus. The function of the nucleus is to store genetic information which is needed to replicate cells. All cells need the ability to replicate therefore all cells have a nucleus. The function of the cell wall is to provide structure and protection for the cell. All cells need structure and potection therefore all of the plant cells have a cell wall.

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2. Which organ had the most vessels? Which organ had the most chloroplasts? Which organ had the most hairs? Is this what you would predict based on the functions of these organs? Explain your answer.

The stem cells had the most vessels because vessels and the stem have similar functions. Vessels transport materials frome one place to another

The leaf cells contained the most chloroplast because the Function of leaves is to create energy for the plant by photosynthesis. Chloroplasts are the organelle responsible for photosynthesis therefore leaf cells contain the most chloroplasts. The Function of roots is to absorb water and minerals from the soil. Hairs increase the surface area of the root which increase the absorption of water from the soil. This is why roots have the most hairs.

3. Describe the hierarchical organization in a plant. How are cells grouped into larger systems? How does this grouping help the plant carry out essential functions?