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Lesson 2: The Root System

Reading and Questions

*The Book
of Trees
pp. 8-12*

1. How do plants attain the water they need to live and grow? Plants extract water from the ground through their roots.
2. What are the two basic designs for plant roots? taproot and fibrous
3. What is the difference between these two designs? The taproot has one primary root jutting straight into the ground with few roots branching from it. The fibrous root is a wide-spreading mass of roots without a primary root.
4. Trees begin their life with what root design? taproot
5. What are the two types of taproots? food-storing and non-storage taproots
6. List examples of food-storing taproots (both from the text and from your own knowledge and experience). beets, carrots, radishes, turnips, parsnip, rutabaga
7. What are the benefits of a fibrous root system? The fibrous root system maintains nutrients by keeping soil from being washed away. It provides a strong and resilient anchoring system for the plant.
8. List the parts of a plant root from outside to inside. epidermis with root hairs, cortex, and vascular cylinder with xylem and phloem
9. Nutrients are minerals and salts that are dissolved in the water the plant absorbs which help the plant grow.
10. The vascular cylinder transports water and food in the root. The xylem specifically takes the water to the stem, and the phloem receives the food made in the leaves.
11. What are cells? Cells are small units of life that make up larger organisms.
12. What are the two functions of the cortex? The cortex supports the plant root and stores food for later use.

Diagrams and Labeling

- Label the plants according to their root design.



food-storing taproot

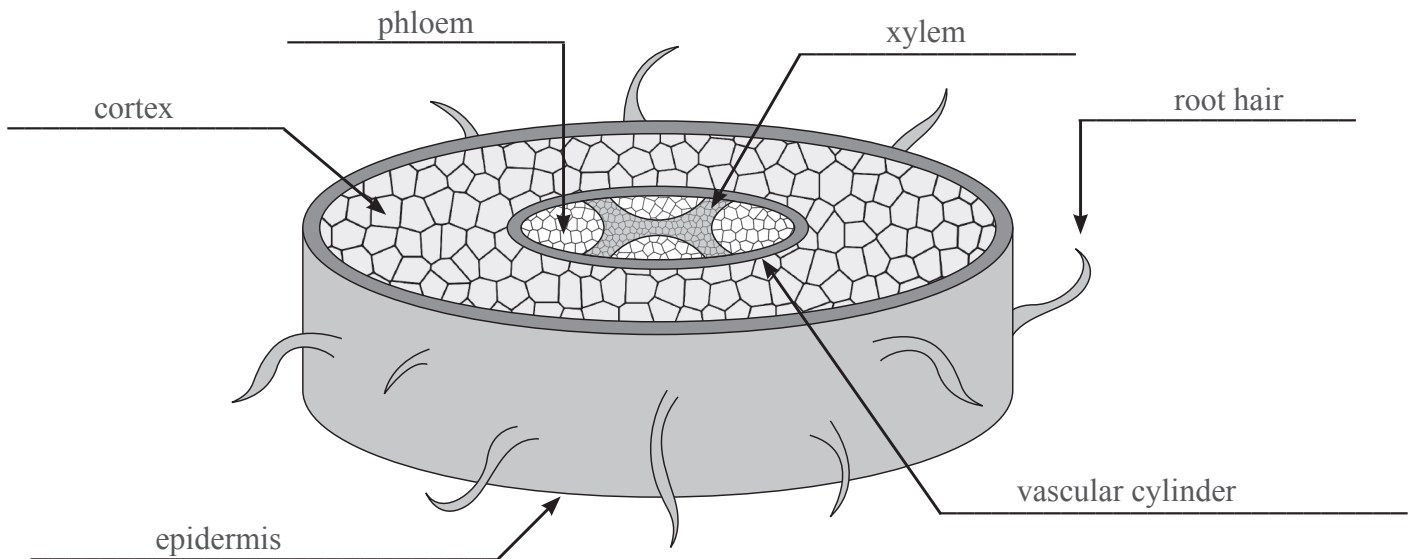


non-storage taproot



fibrous

- Label the parts of a plant root.



Activities

1. (With permission!) Gently uproot a plant near your house or building and examine its root system. (The larger the roots, the easier the activity.) What type of root system does it have? Can you see the root hairs?
2. Make a cross section (if you are holding the plant vertically, make a cut horizontally) of the root specimen you collected, and using a magnifying glass, see how many parts of the internal structure you can identify.