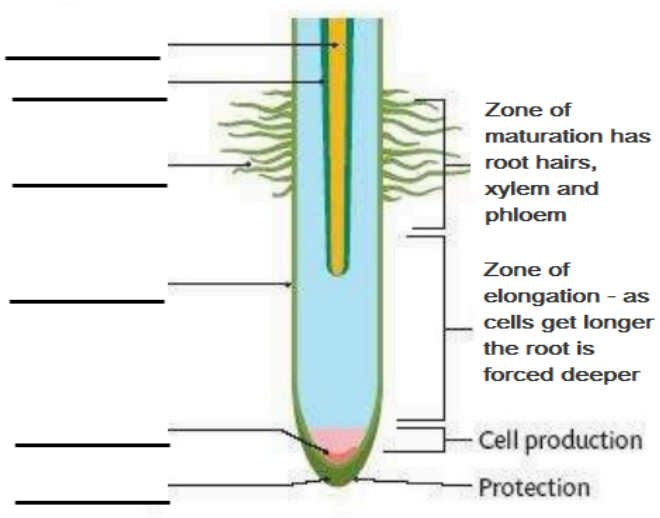
Roots and Stems – 2016

Two Root Types

1. Monocot roots are fibrous and networked.
2. Dicots have tap roots like the long thick central root seen on dandelions.

Four Functions of Roots

1. Anchor the plant in the soil.
2. Absorb water and minerals.
3. Protect the soil from erosion.
4. Carry water to plant through xylem.



The Structure of a Root: 4 zones

1. Zone of Maturation: cells differentiate into different types of cells.
2. Zone of elongation: allows the root to get deeper within the soil
3. Meristematic region: rapid mitosis of undifferentiated meristemic cells
4. Root Cap: protects the meristemic region.

Absorbing Water and Nutrients

Root hairs are formed as extensions of the epidermis and greatly increase the surface area.
Water enters from the soil by osmosis and flows up through the xylem.
Nutrients like nitrates, phosphates, potassium and magnesium dissolve in water and enter by the roots.

Two Types of Stems

1. Monocots have scattered vascular tissue.
2. Dicots have vascular tissue in an outer ring.

Annual and Perennial Stems

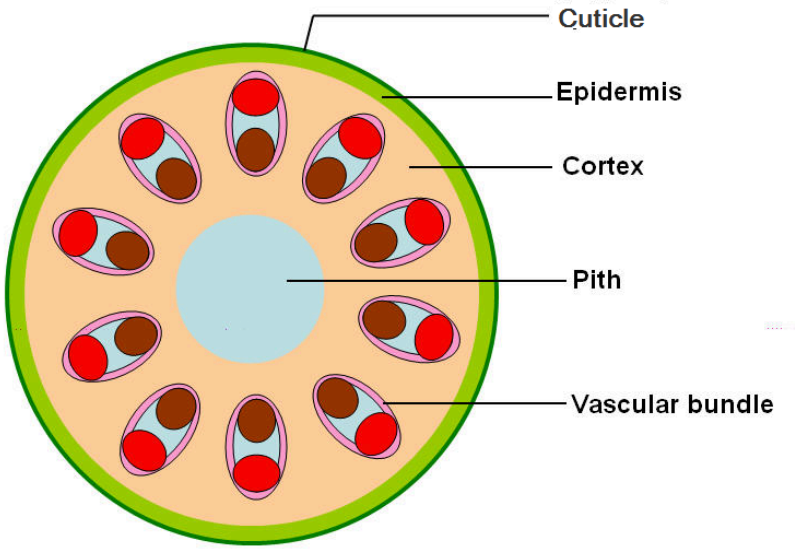
Annual plants that must grow from seeds every year have green stems.
Perennial plants like trees and shrubs have woody stems.

Functions of Stems

1. Hold the leaves up to light.
2. Transport water and dissolved minerals in xylem.
3. Transport dissolved sugar in the phloem.
4. Specialized stems have other functions:
    a. Stolons – strawberries have runners for asexual reproduction
    b. Rhizomes – irises have underground stem buds for asexual reproduction
    c. Tubers – starch storage like potatoes

Structure of Dicot Stems

dicotyledon stem:



Roots and Stems

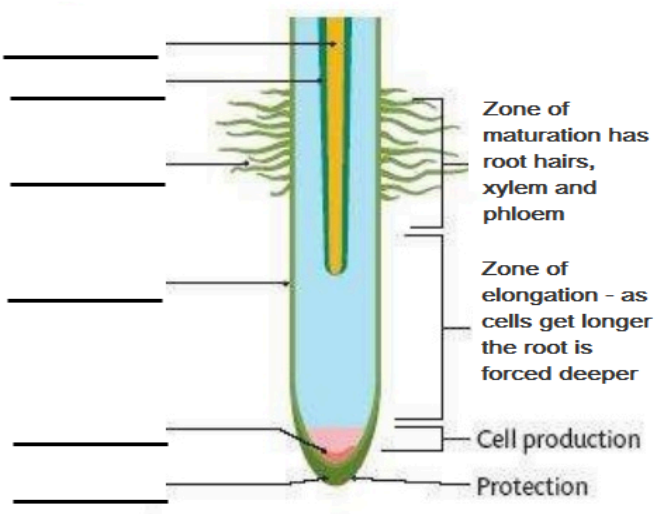
Two Root Types

1. Monocot roots are fibrous and _____.

2. Dicots have _____ like the long thick central root seen on dandelions.

Four Functions of Roots

1. _____ the plant in the soil.
2. _____ and minerals.
3. Protect the _____
4. _____to plant through xylem.



The Structure of a Root: 4 zones

1. Zone of **Maturation**: cells differentiate into _____ .

2. Zone of _____: allows the root to get _____

3. Meristematic region: _____ of undifferentiated meristemic cells

4. Root Cap: _____ the meristemic region.

Absorbing Water and Nutrients

_____ are formed as extensions of the epidermis and greatly _____ the _____. Water enters from the_____ and flows up through the _____. Nutrients like _____and magnesium dissolve in water and enter by the roots.

Two Types of Stems

1. Monocots have _____.

2. Dicots have vascular tissue in an _____.

Annual and Perennial Stems

_____ plants that must grow from seeds every year have _____.

_____ plants like trees and shrubs have _____ stems.

Functions of Stems

1. Hold the _____.
2. Transport water and dissolved minerals in xylem.
3. Transport _____.
4. Specialized stems have other functions:
    a. _____ – strawberries have runners for asexual reproduction
    b. _____ – irises have underground stem buds for asexual reproduction
    c. _____ – starch storage like potatoes

Structure of Dicot Stems

