



Plant Structure & Function

How do plants live?

Lesson 8



How Plants Live



- Plants live in one spot and survive quite well
- If they are stuck in one spot, how do they get water or food?



How Plants Live

- Plants do not have to get their food from other sources
 - They make their own food right where they are



Vascular and Nonvascular plants

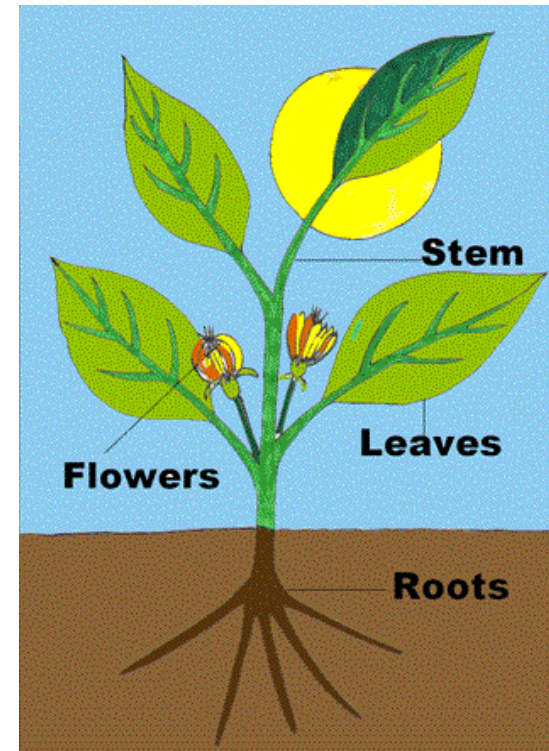


Vascular plants

- Ferns, trees, flowers etc.
- Plants that have tube-like structures made from **vascular tissue** that transport food and water through the plant
- Have well developed leaves, stems, and roots

Vascular Tissue

- Allows food and water to be transported over a distance
 - Plants can grow in places where water is not always present
- Is thick and provides support for a plant which allows them to grow taller



Vascular and Nonvascular plants

Nonvascular plants

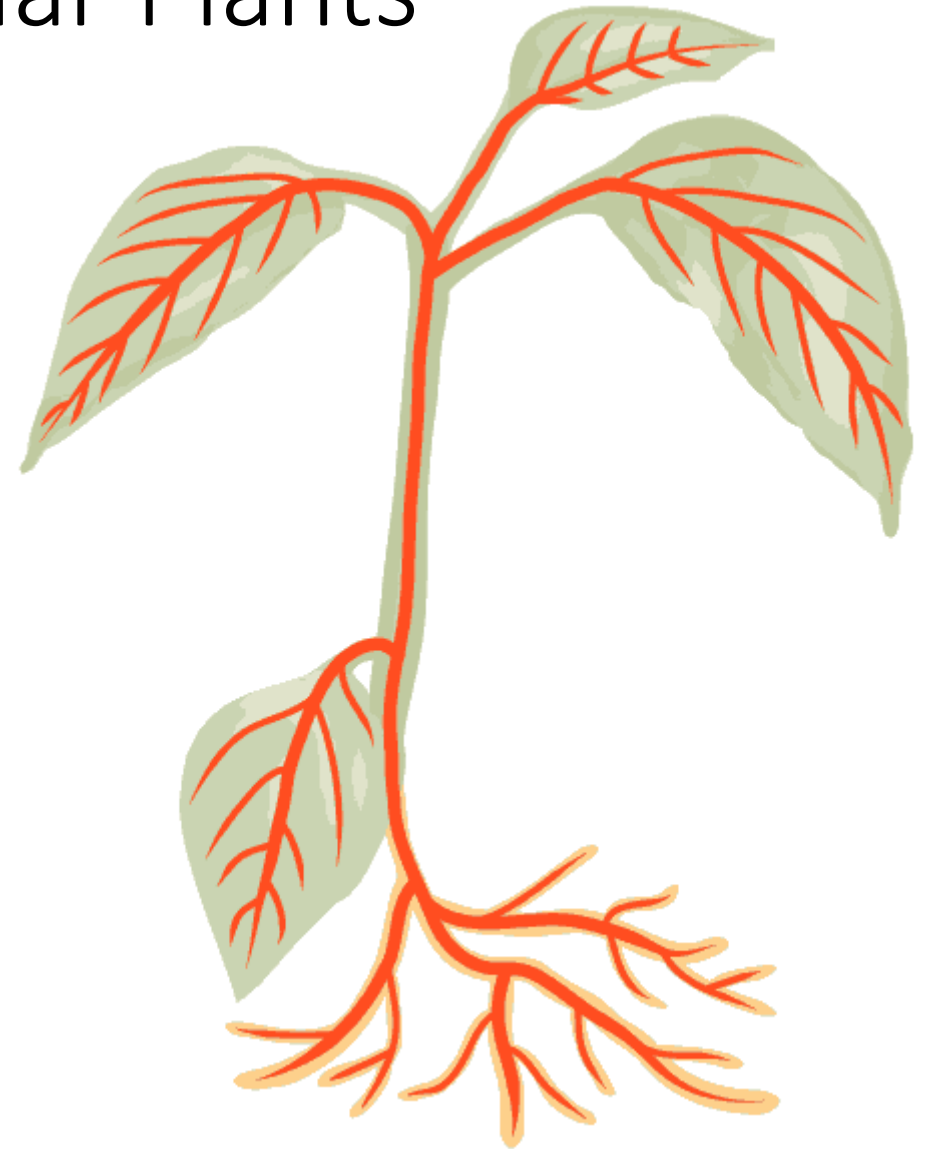
- Mosses (green “fuzz” on damp rocks and trees/surfaces), liverworts (found along stream beds), and hornworts (usually grow in moist, humid areas)
- Do not have tube-like cells
- Do not have tubes to transport water or to support them
- These plants are short and must have constant contact with moisture
- Usually grow in damp, shady places on the ground, the sides of trees and rocks
- Do not have true leaves, stems, or roots



The Vascular System in Vascular Plants

- Tiny tubes run through roots, leaves, and stems of most plants
- Connects all parts of the plant
- Without the vascular system, the parts of the plant could not do their jobs

What else has a vascular system or something similar?



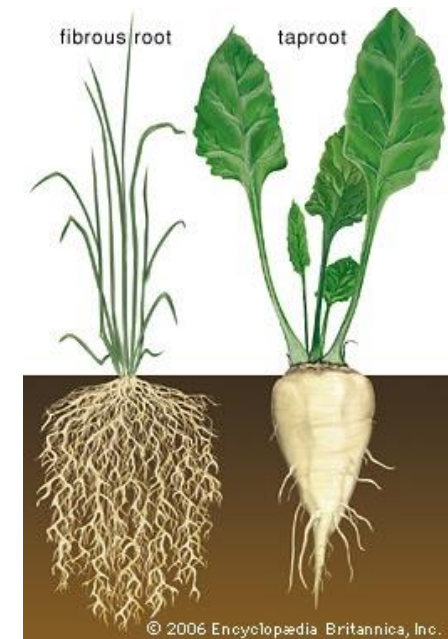
The Roots

Plant Vascular System



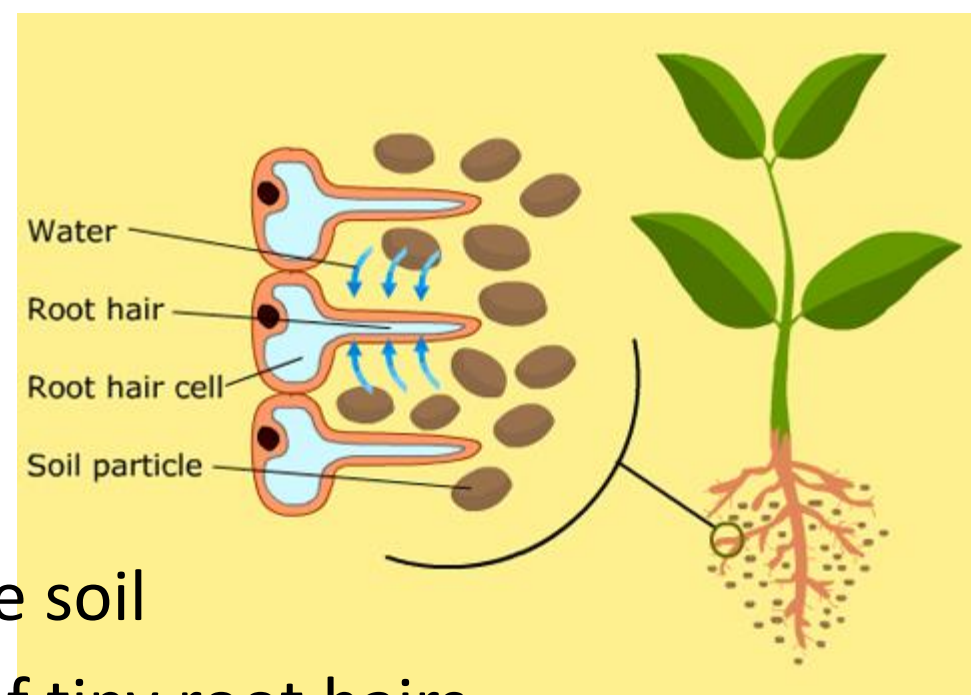
Important functions of roots:

- Hold plants firmly to the ground
- Absorb water and minerals from the soil
- Push their way through the soil to reach the water and minerals they need
- Store water and minerals
- Brings water and minerals to other parts of the plant



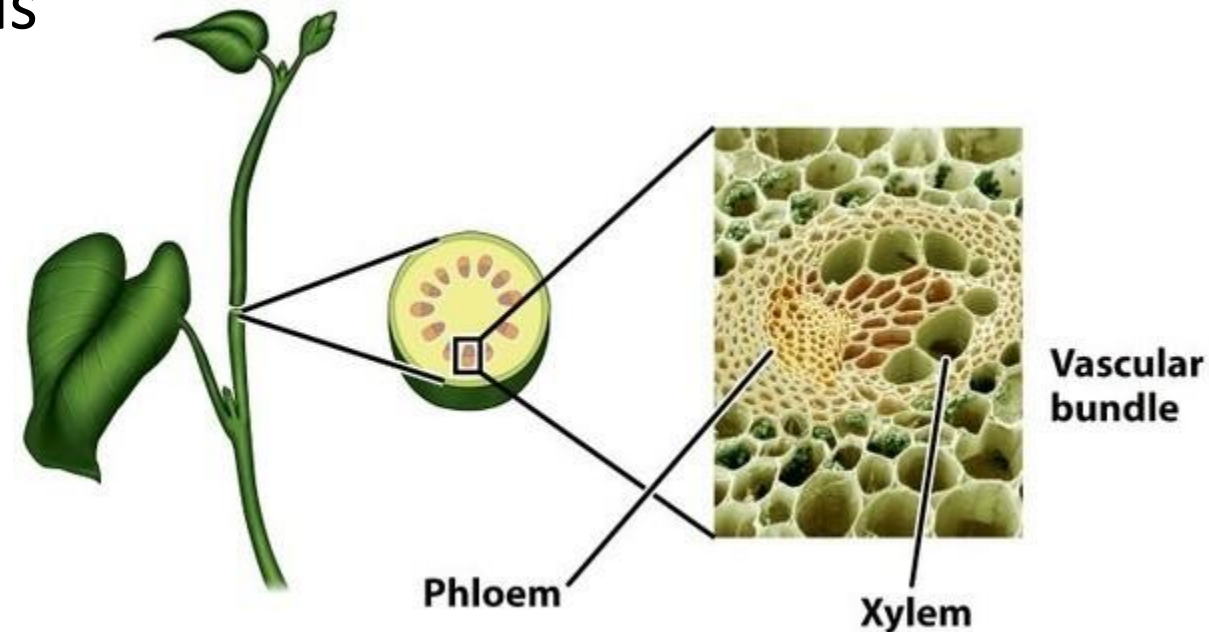
The Parts of a Root

- The tip of a root is always growing
 - As it grows, it pushes its way through the soil
- The tip of each root is covered by millions of tiny root hairs
 - The root hairs absorb water and minerals from the soil
- Roots can store the water and minerals until needed



The Parts of a Root cont'd

- Water and minerals can also move to the stems and leaves through the root's vascular tissue
- **XYLEM** vascular tissue forms tubes that carry water and minerals from roots to stems and leaves
 - Leaves use the water and minerals to make food
- **PHLOEM** vascular tissue forms tubes that carry food from leaves to stems and roots
 - The roots can also store food



The Stem

Plant Vascular System

- The stem of a plant connects the leaves with the roots
- Most stems are above ground

Three Functions:

1. Stems support the leaves
 - Hold the leaves up so they can receive sunlight
2. Stems transport food, water, and minerals through the plant
3. Store food

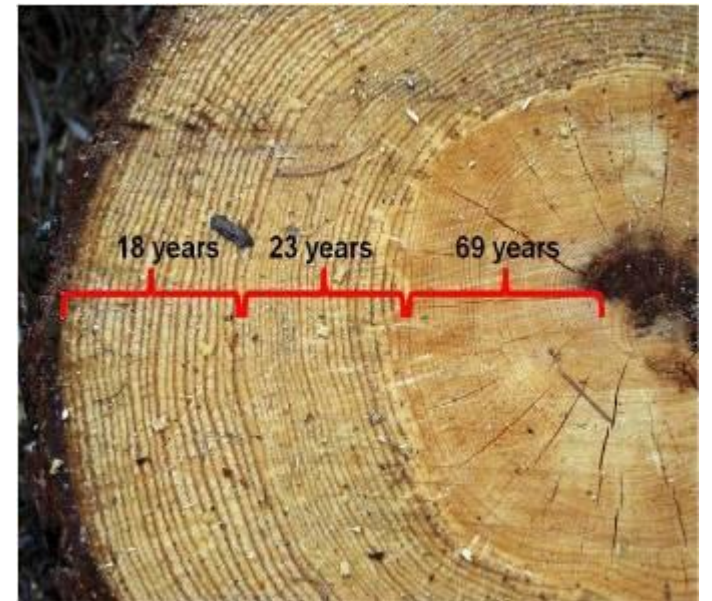


The Parts of a Stem

- Like roots, plant stems also contain **xylem** and **phloem**
- A stem also contains a special layer of **growth tissue**
- Growth tissue produces new layers of xylem and phloem cells
 - In some plants, these layers build up so stems become thicker as they get taller

Example:

- In a tree trunk, one layer forms a new ring each year
 - You can count these rings, called **annual growth rings**, to tell the tree's age



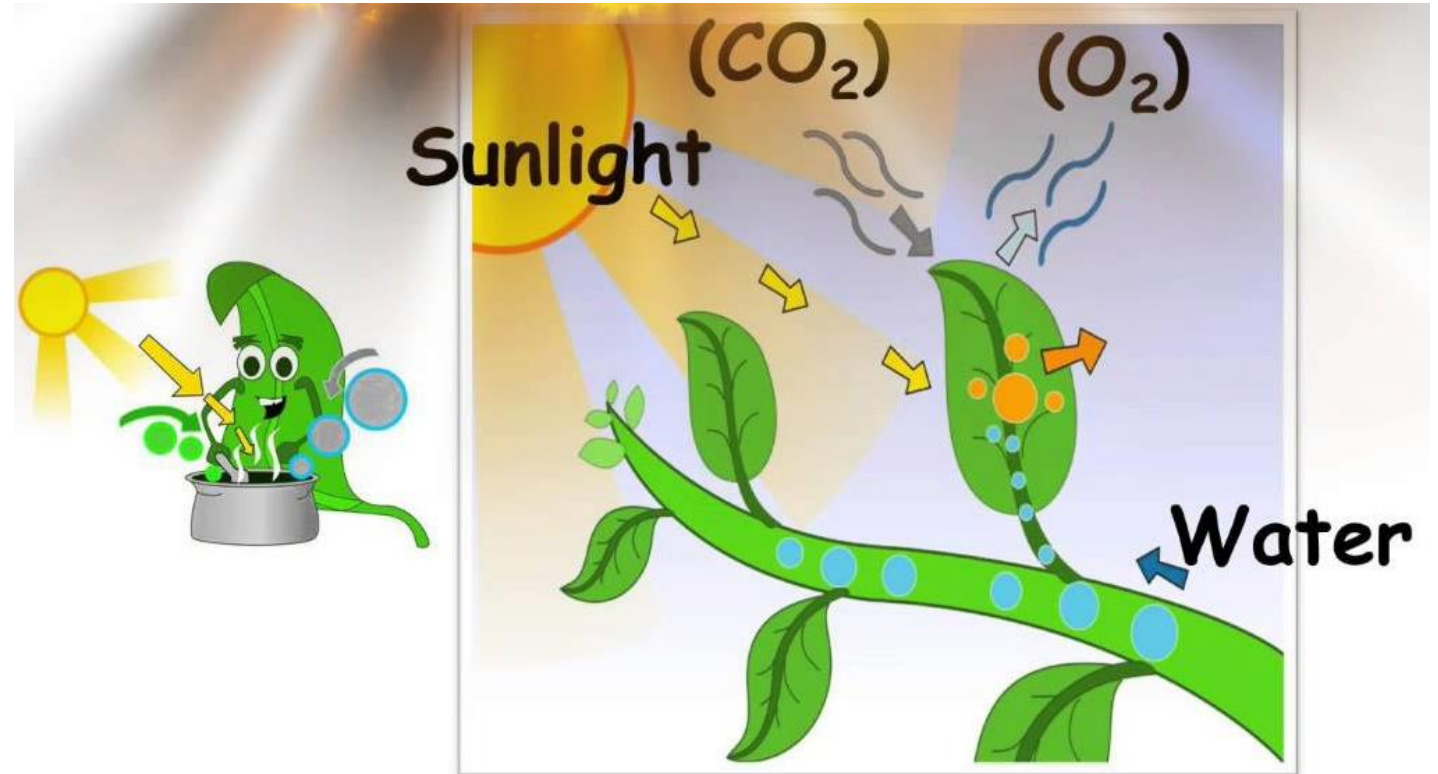
The Leaves

Plant Vascular System

- Leaves are the parts of the plant that trap sunlight

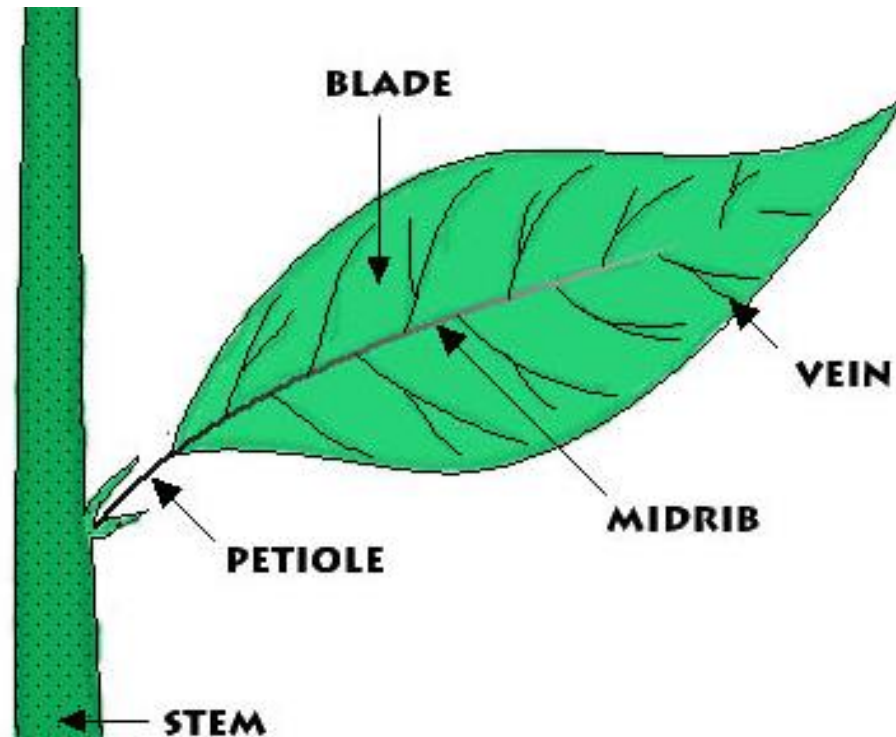
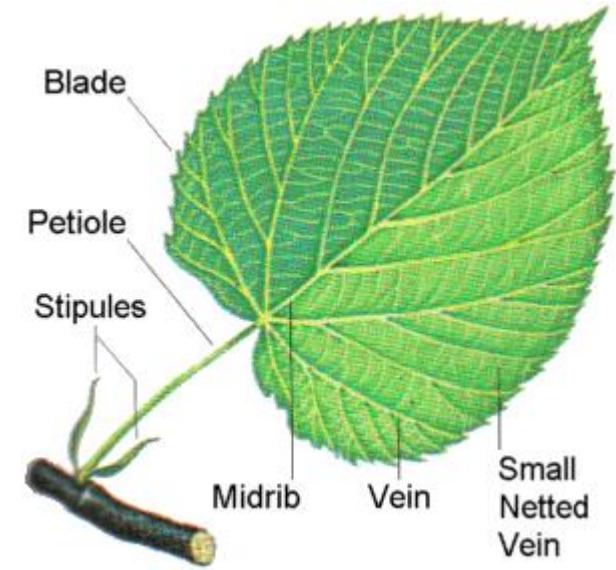
Four Functions:

1. Make food
2. Store food
3. Transport food to stems
4. Allow gases to enter and leave the plant



The Parts of a Leaf

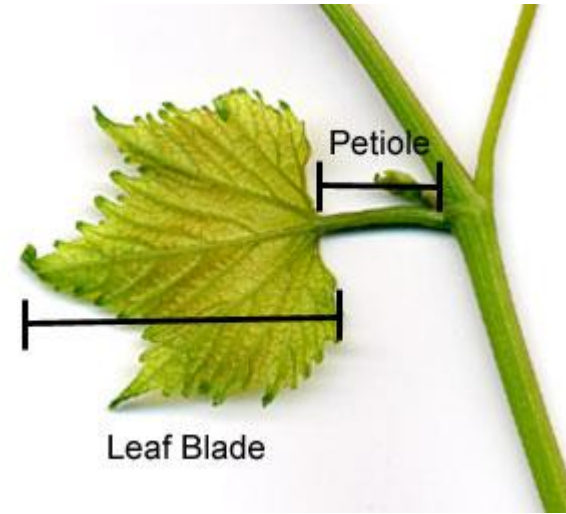
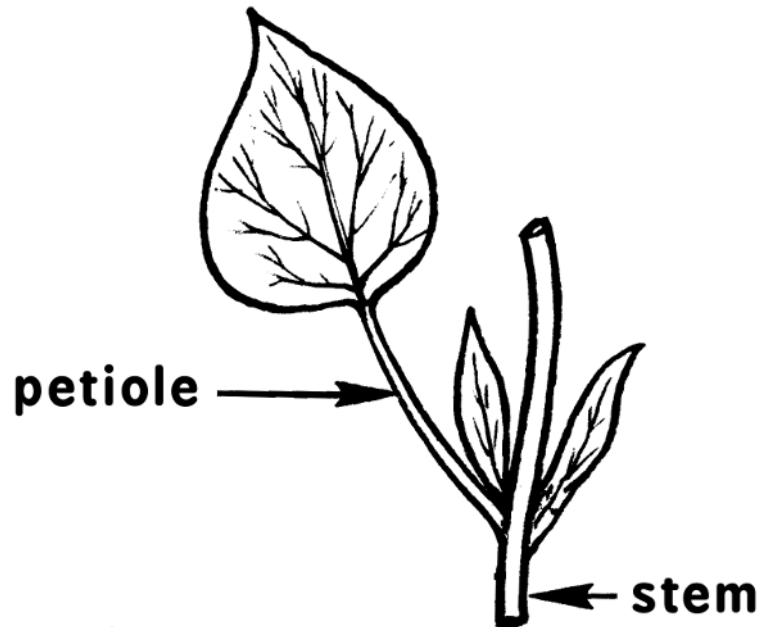
- Leaves have three main parts:
 - The petiole
 - The blade
 - The veins



The Parts of a Leaf cont'd

The **petiole**

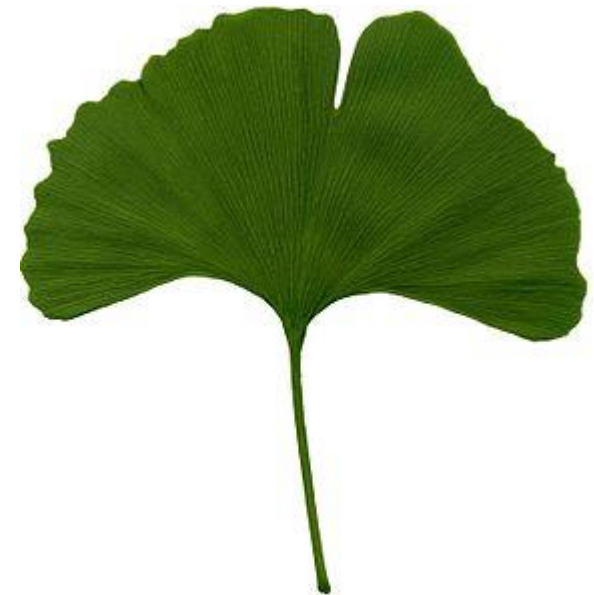
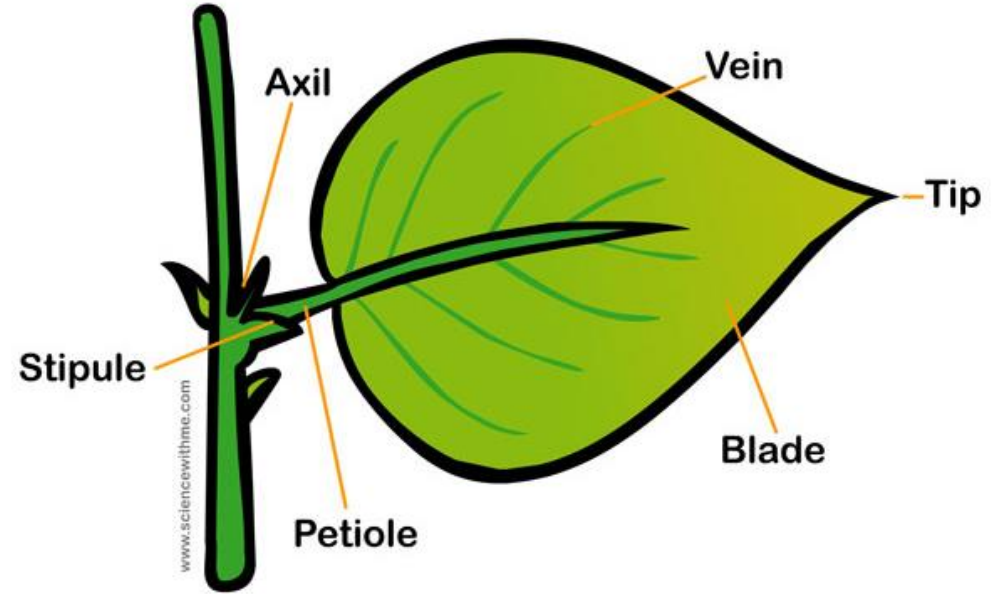
- Aka the stalk
- Attaches the leaf to a stem or a branch



The Parts of a Leaf cont'd

The **blade**

- The main part of the leaf
- Collects light from the sun to make food
- Many leaves are thin and have flat surfaces
- A tree full of leaves can gather large amount of energy from the sun



The Parts of a Leaf cont'd

The **veins**

- Part of the plant's vascular system
- Thin tubes that are arranged in a pattern
- Veins run throughout the blade
- They also run through the petiole (stalk) to the stem
- The veins of leaves transport food and water between the stem and the leaf



The Parts of a Leaf cont'd



Stoma (*sing.*) **stomata** (*pl.*)

- The underside of each leaf has many small openings called **stomata**
- Each opening is called a **stoma**
- Stomata allow gases, such as carbon dioxide (CO₂) and oxygen (O₂), to enter and leave the leaf
- Water vapor also leaves through stomata

Why do you think stomata are found on the underside of a leaf instead of on top?

Summary

Vascular plants have **vascular** vessels to carry water and food to all the **different** parts of the **plant**

- The **phloem** is the vessel that transports food
- The **xylem** is the vessel that transports water

Important functions of roots:

- Hold plants firmly to the ground
- Absorb water and minerals from the soil
- Push their way through the soil to reach the water and minerals they need
- Store water and minerals
- Brings water and minerals to other parts of the plant



Four Functions of leaves:

1. Make food
2. Store food
3. Transport food to stems
4. Allow gases to enter and leave the plant

Three Functions of stems:

1. Stems support the leaves
Hold the leaves up so they can receive sunlight
2. Stems transport food, water, and minerals through the plant
3. Store food