Tree growth & structure

Learning Objectives

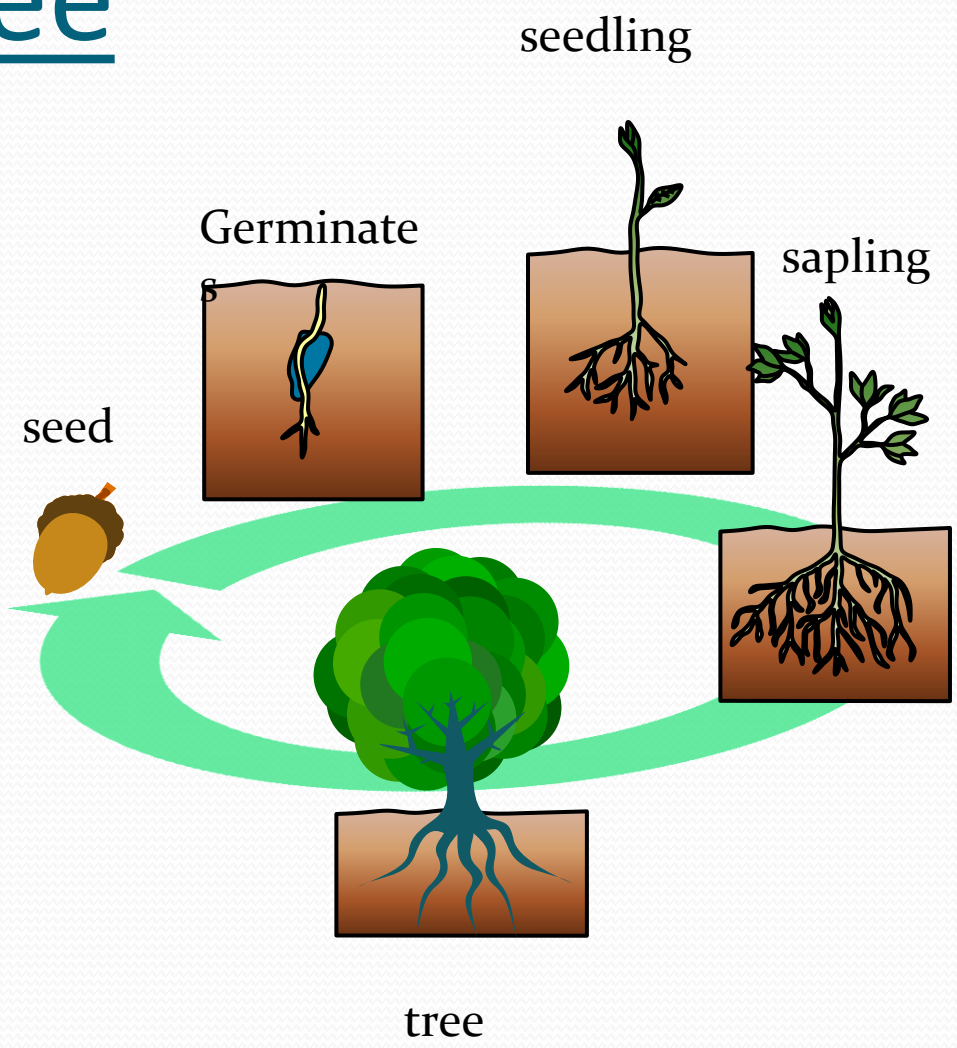
- To be able to identify and give a brief summary of the life cycle of a tree.
- To be able to explain the process of photosynthesis.
- To be able to list the raw materials required for photosynthesis to occur.
- To be able to identify the various parts of a tree
- To be able to explain the function of each part

Life cycle of a tree

- All trees undergo the same life cycle
- They start their lives as seeds

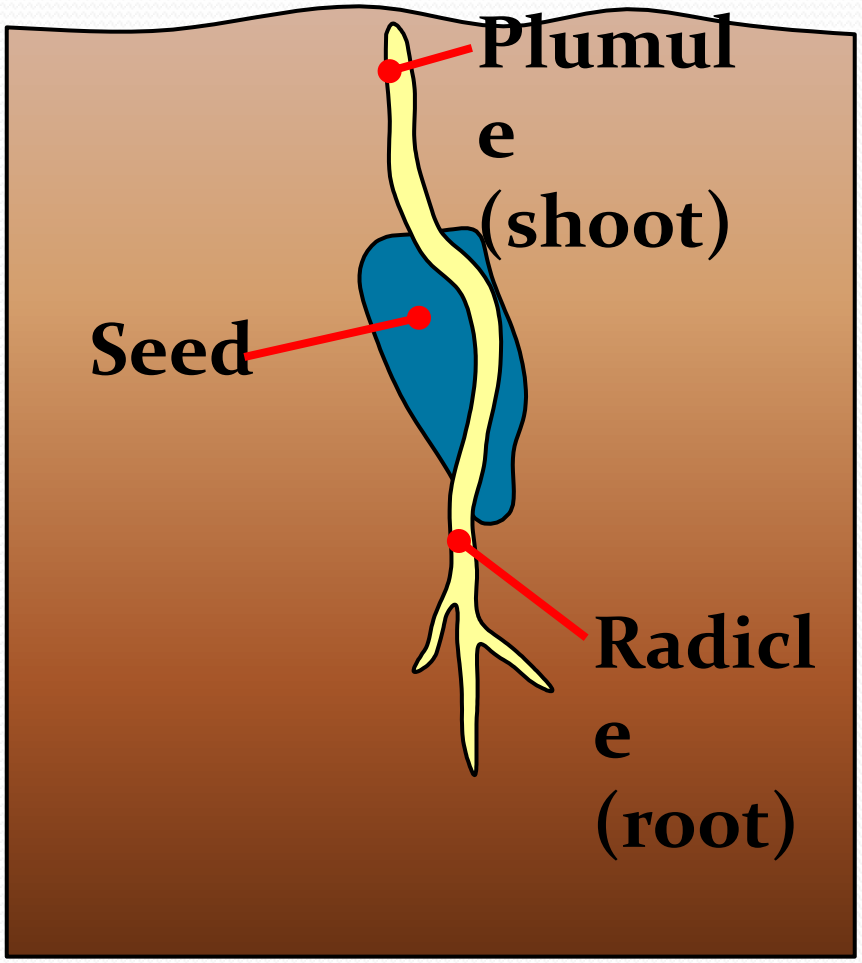
1. In spring the seeds **germinate** (grow)
2. The plant grows into a **seedling**
3. The seedling grows into a **sapling**

- The sapling grows into a tree



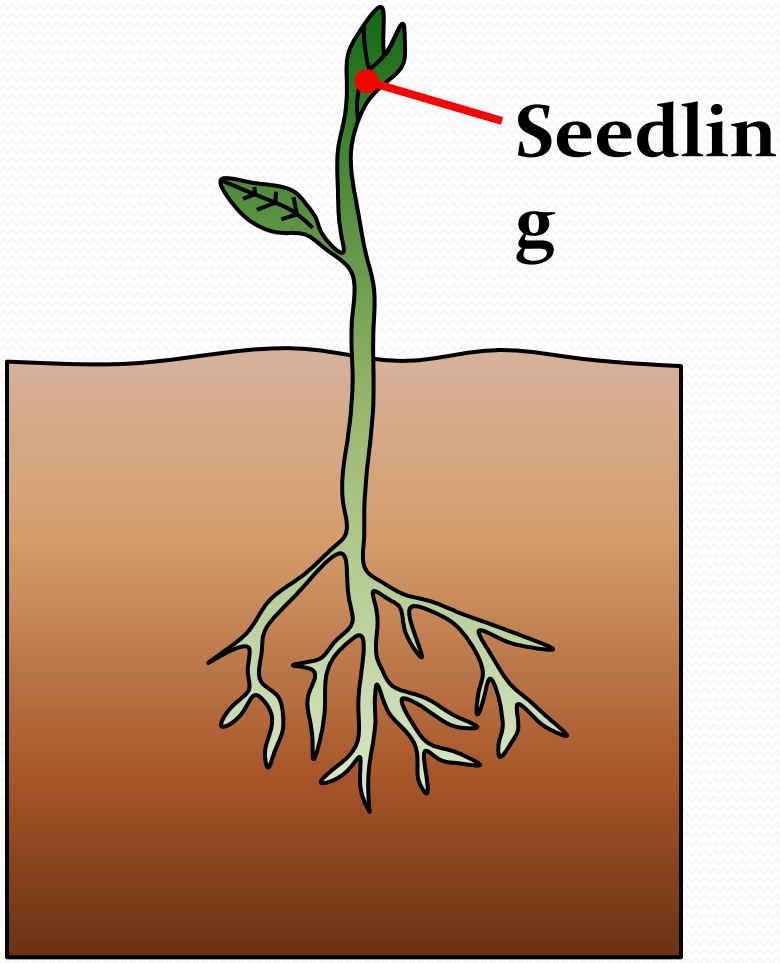
Stage 1: Germination

- In autumn the seed falls to the ground and lay dormant (sleep) for the winter.
- In spring, when it gets warm, the seed **germinates.**
- Germination is when the shoot (the **plumule**) grows toward the surface, and the root (the **radicle**) grows deeper into the soil.
- The plant is living off a store of food in the seed.



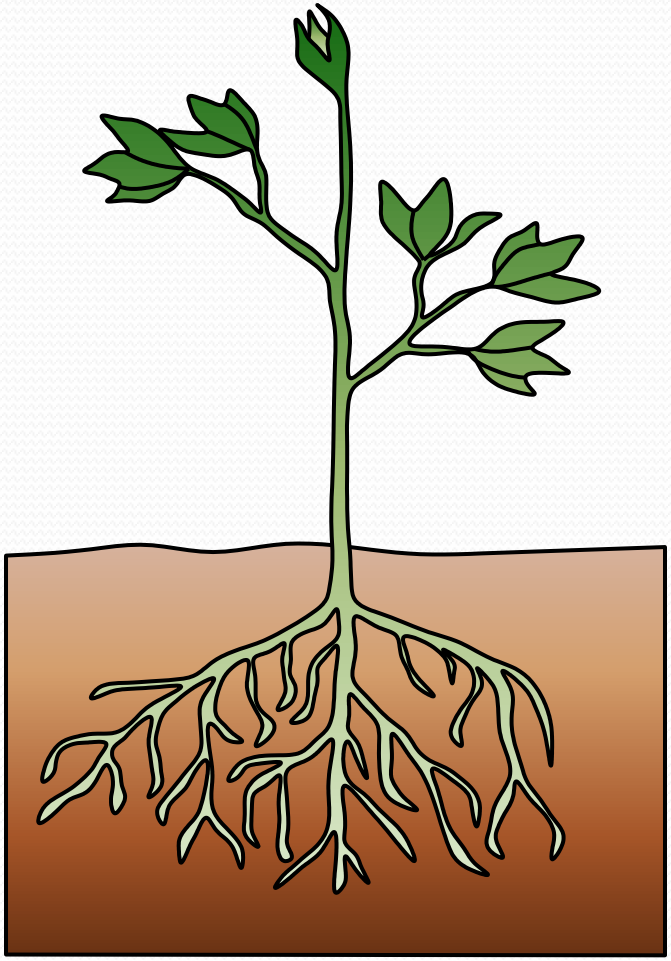
Stage 2: Seedling

- The plant becomes a seedling.
- It has now developed roots and leaves.
- The plant can now make its own food through a process called **photosynthesis**.



Stage 3: Sapling

- The plant grows into a sapling.
- The plant gets stronger and develops bark and many more leaves.
- As the sapling gets bigger it will become a tree.



Photosynthesis

- **Photosynthesis** is the process by which trees make their own food.
- For photosynthesis to happen the following are needed

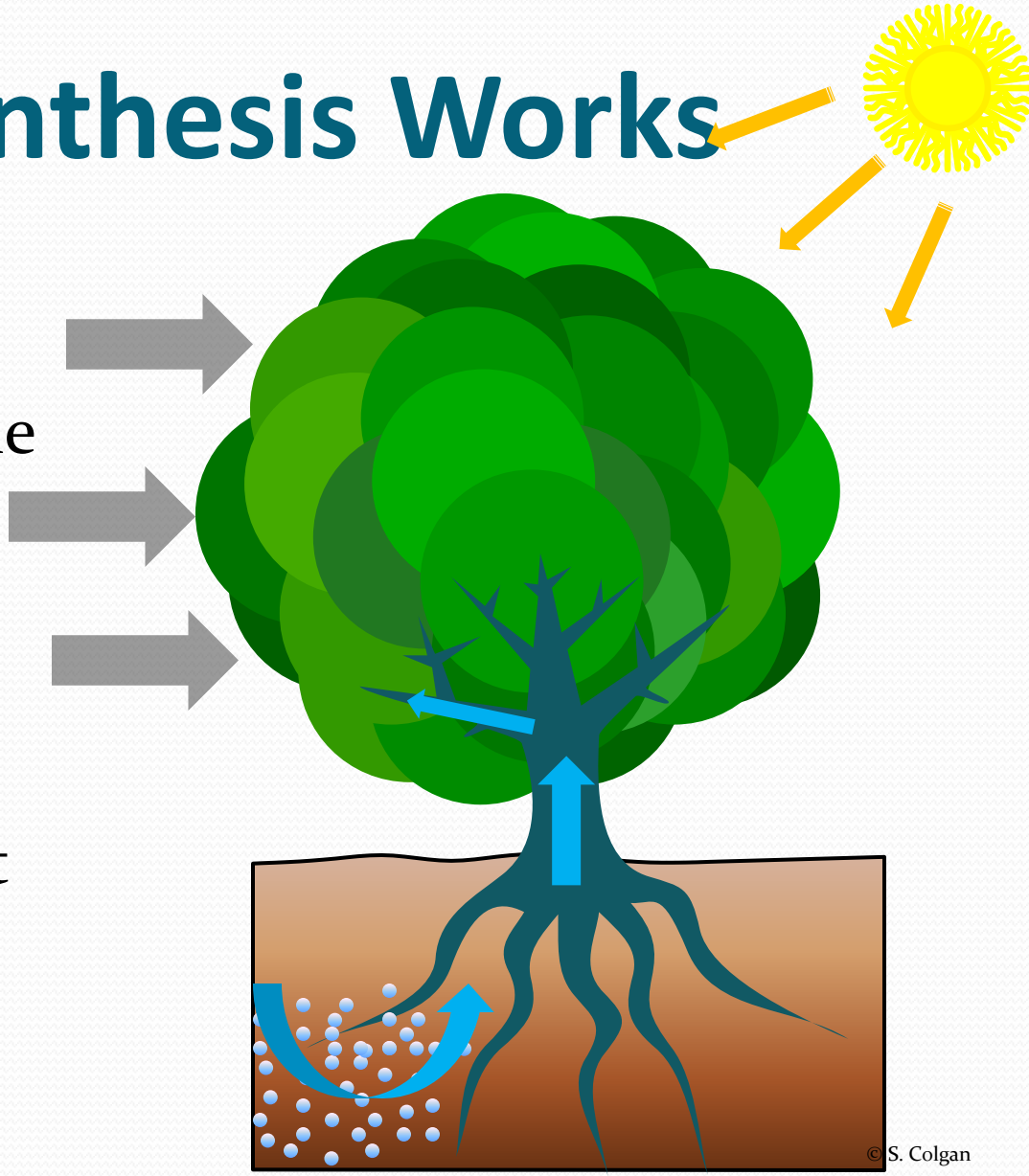
a) Carbon Dioxide
b) Water
c) Sunlight
d) Chlorophyll (the green colour in leaves)

How a tree grows

- Trees make their own food by capturing the suns energy in a process called **photosynthesis**
- Photo= light Synthesis = building
- Leaves are the food factories as the **chlorophyll** in the cells of leaves trap the sunlight

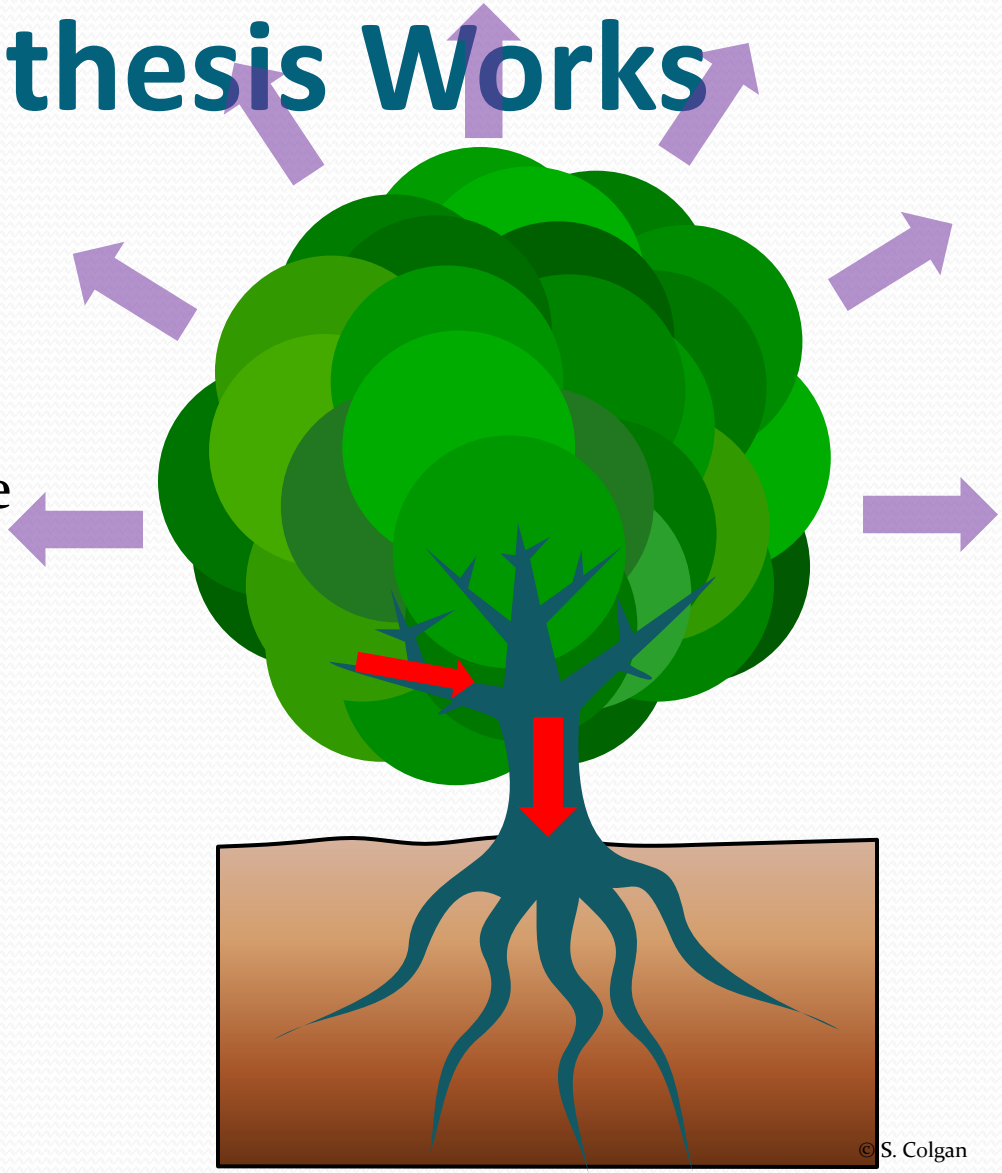
How Photosynthesis Works

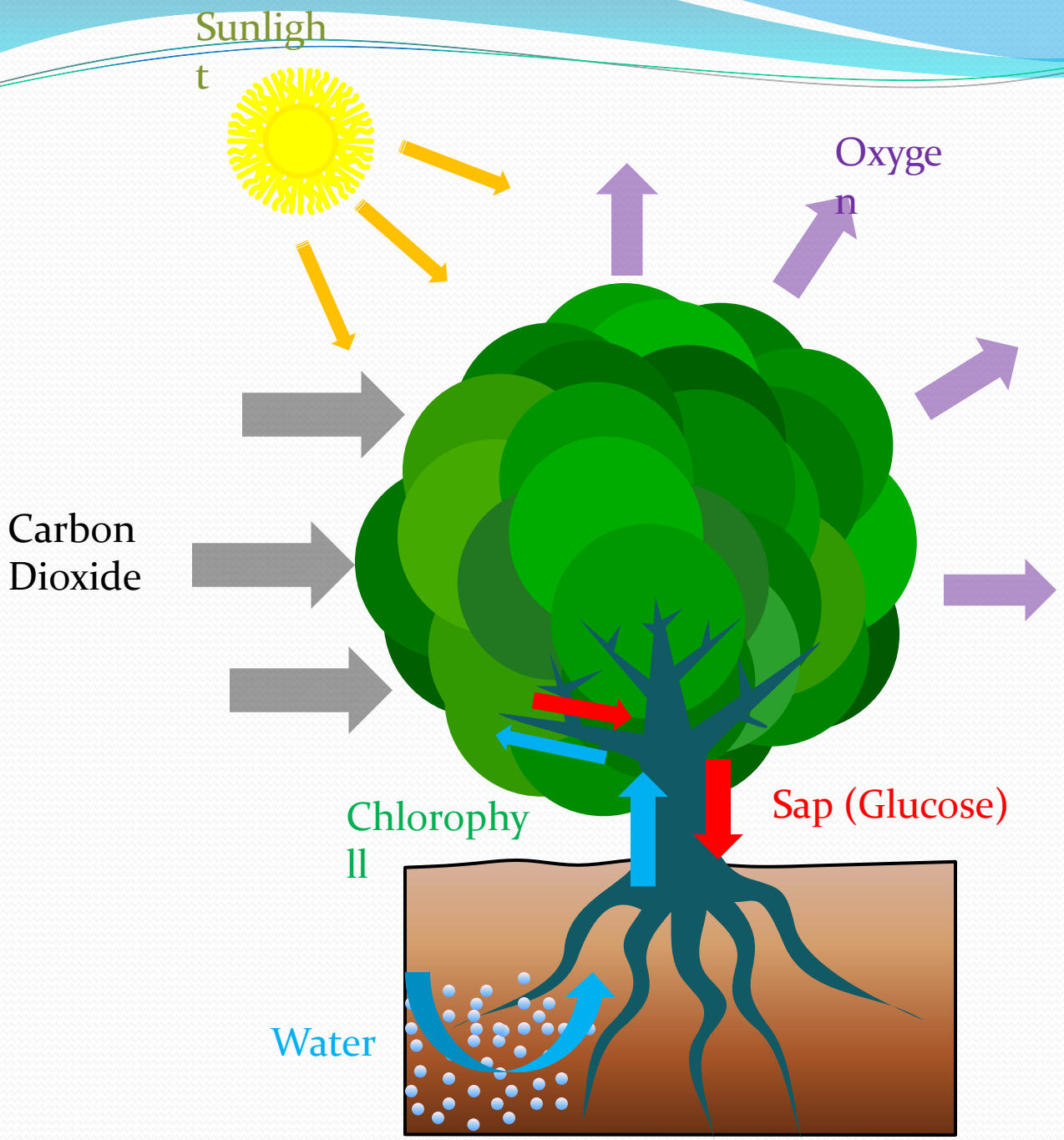
1. The trees absorb water through their roots.
2. The water travels up the trunk
3. Leaves take in carbon dioxide
4. The chlorophyll in the leaves absorbs sunlight



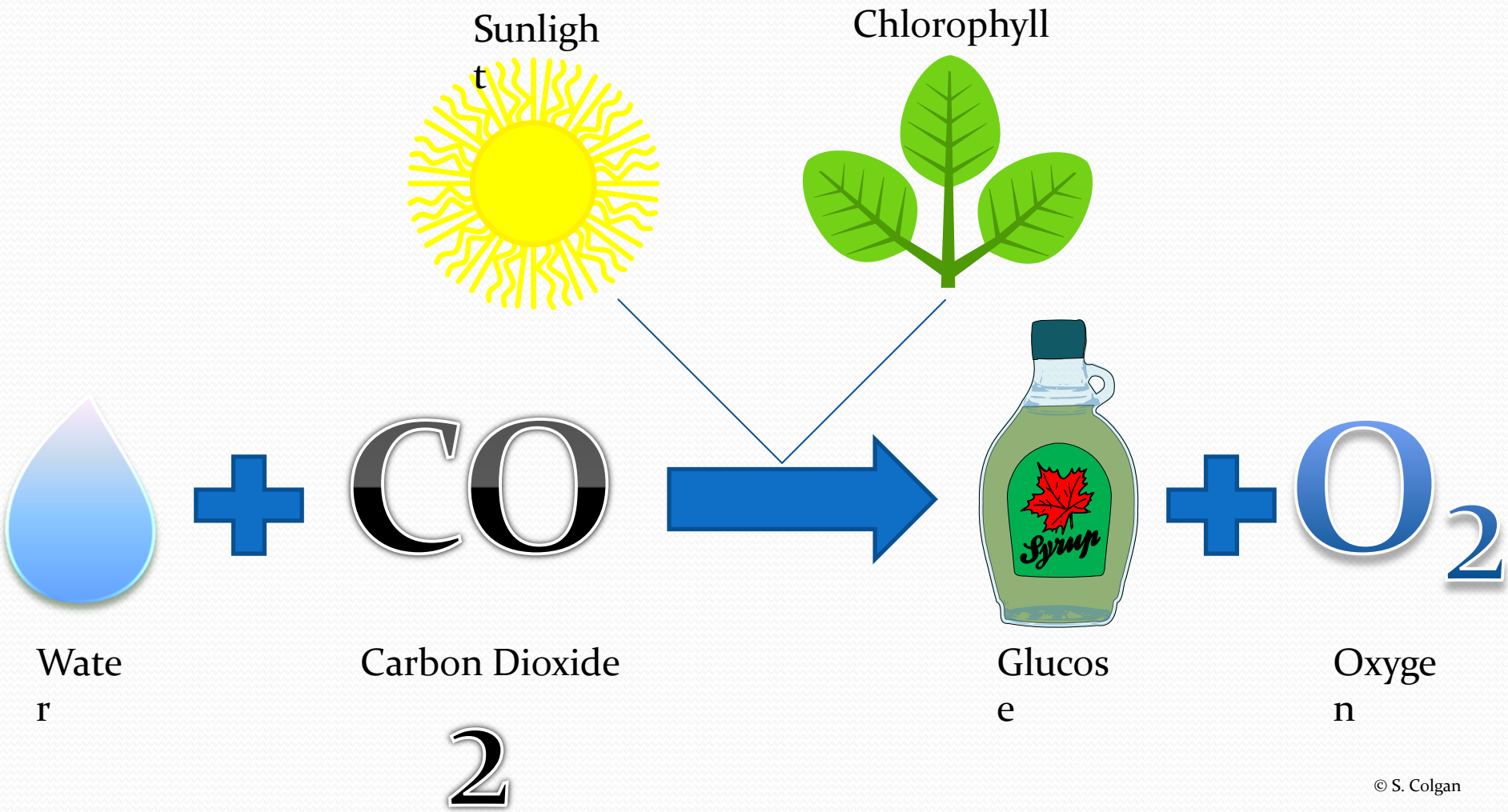
How Photosynthesis Works

5. This starts a chemical reaction with the carbon dioxide and water, which turns it into sap (glucose) which is food for the tree
6. The sap runs down the tree (through the bast) feeding the tree as it moves
7. Oxygen is made as a by-product and given out into the atmosphere.
8. Some water is lost through the leaves. This is called **Transpiration**




Sunlight
Oxygen
Carbon Dioxide
Chlorophyll
Sap (Glucose)
Water

Photosynthesis

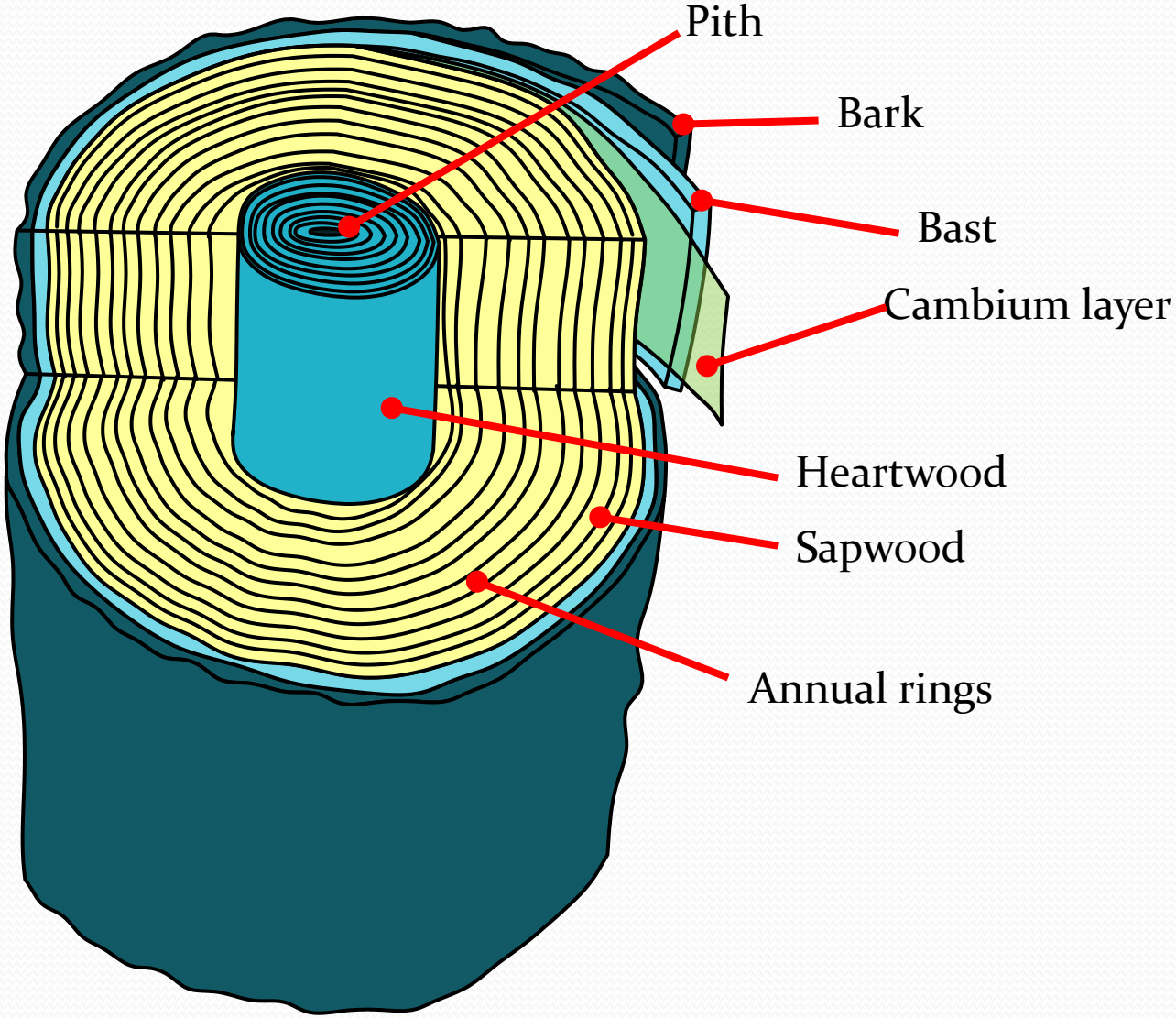


Transpiration

- **Transpiration** is the evaporation of water from the leaves
- This helps cool down the tree on a hot day
- This also helps “pull” the water from the root all the way to the leaves, like “pulling” on a drinking straw

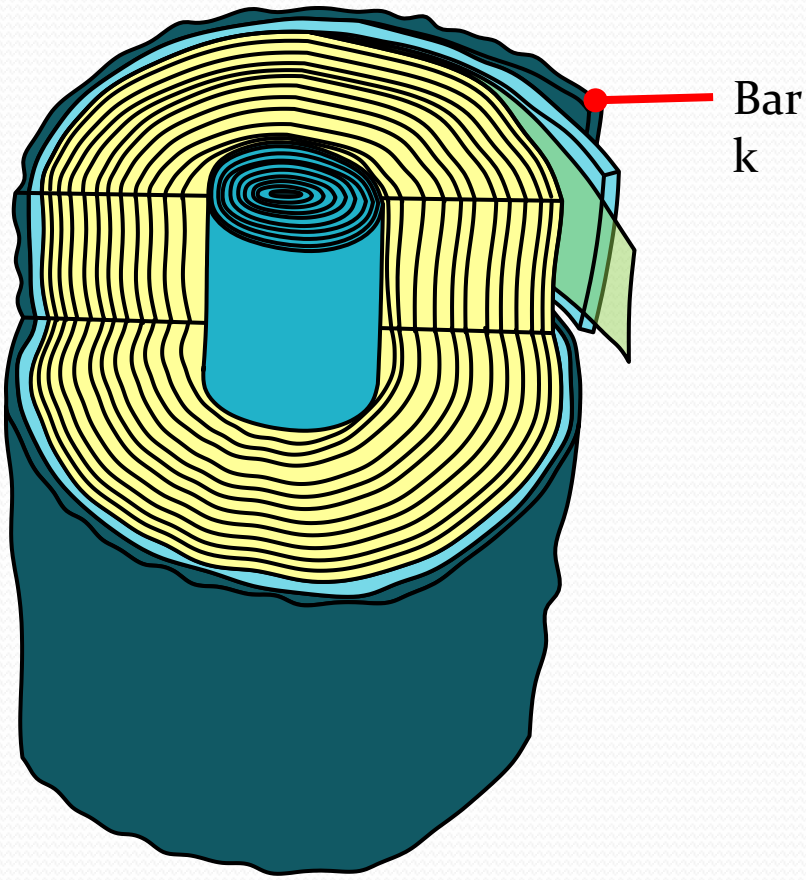
Parts of a Tree

Parts of a Tree



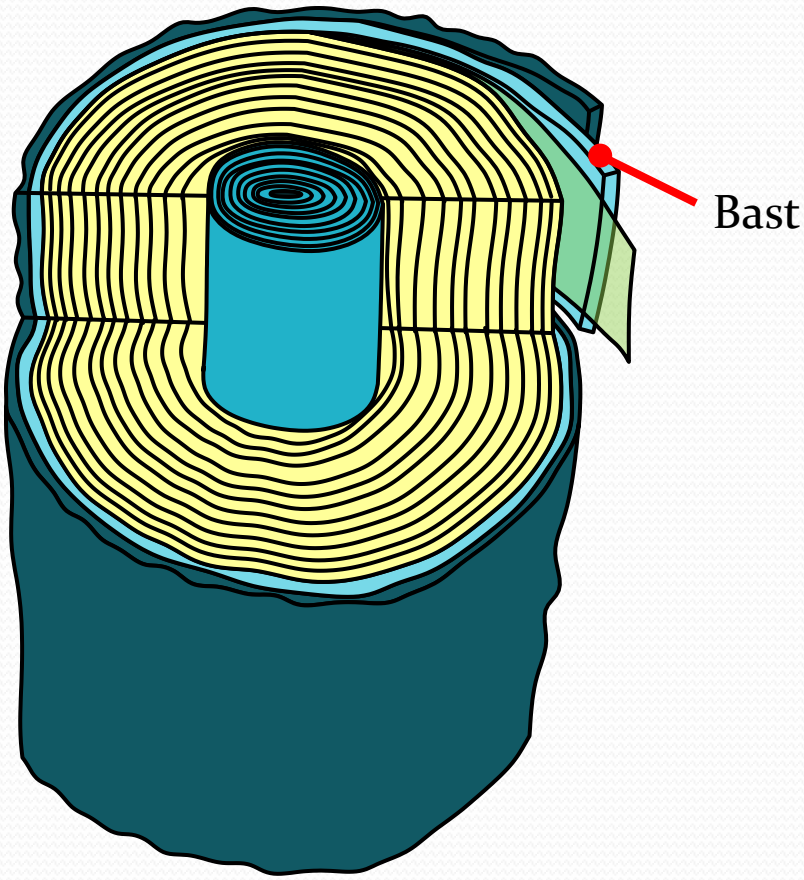
The Bark

- **The Bark:** Is a protective layer of dead cells, it stops insects and animals damaging the tree.



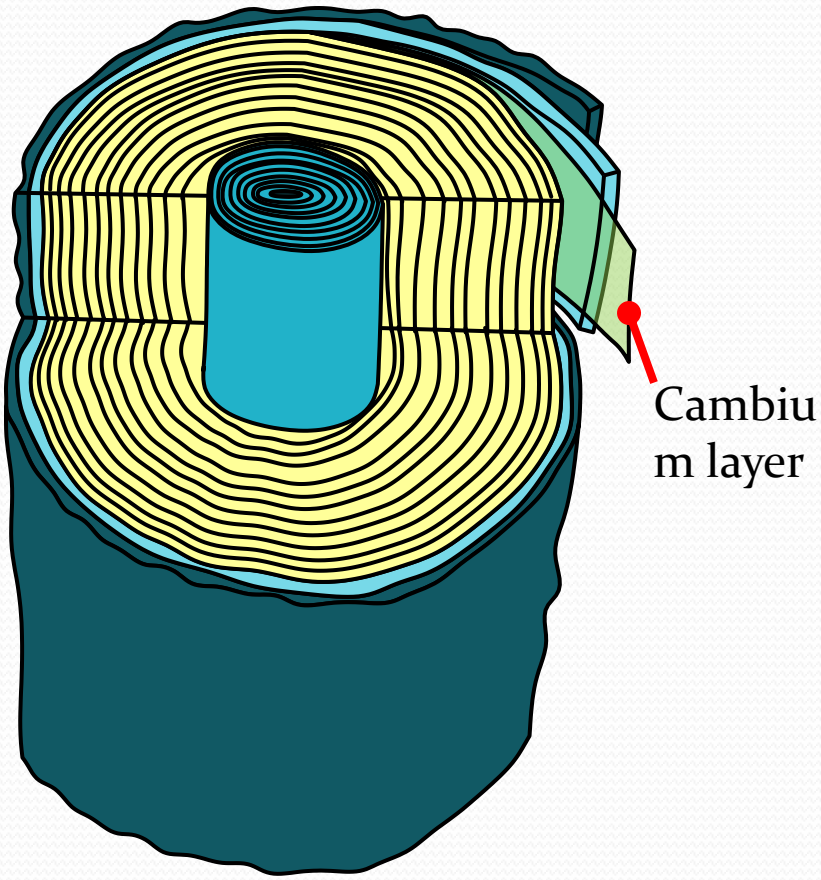
The Bast

- **The Bast:** Is the inner layer of the bark. This layer carries food (sap) down the tree.



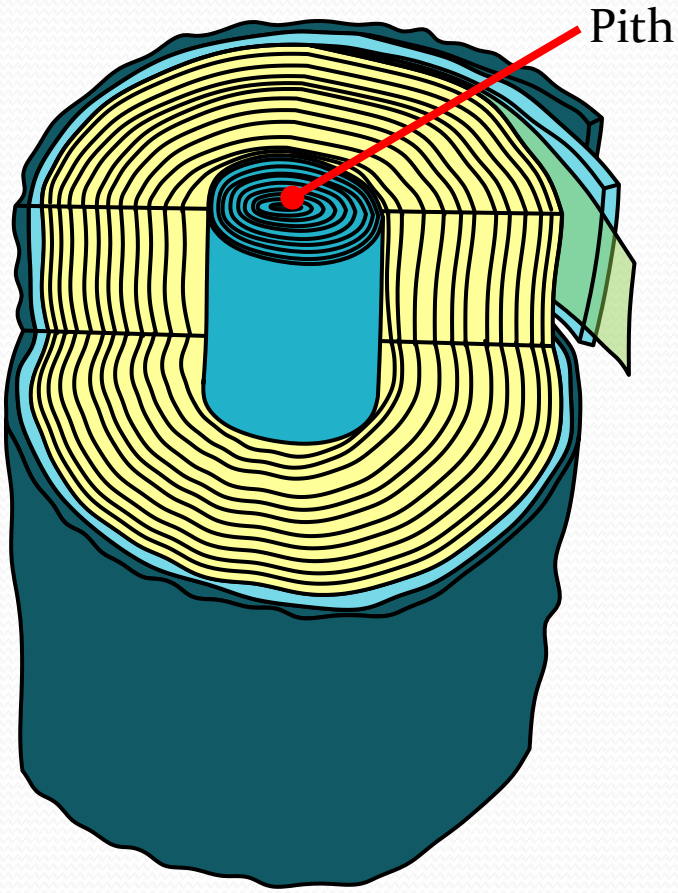
Cambium Layer

- **The Cambium Layer:** This is a layer where the growth of the tree takes place.



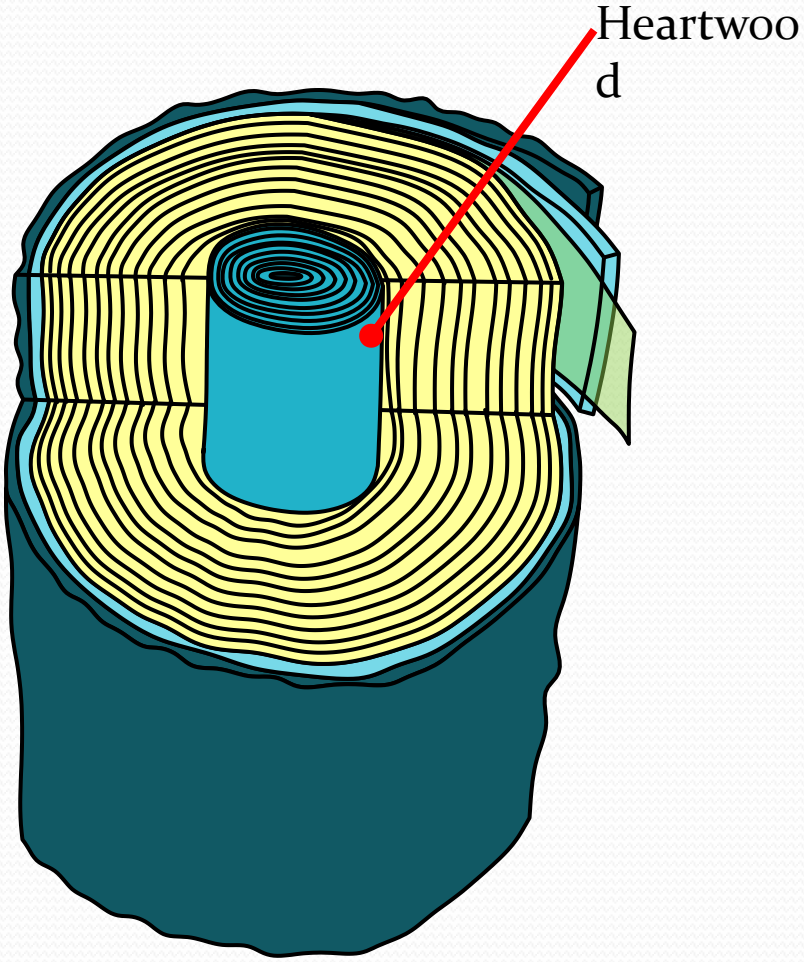
The Pith

- **The Pith:** Is the oldest part of the tree. It is the remains of the sapling.



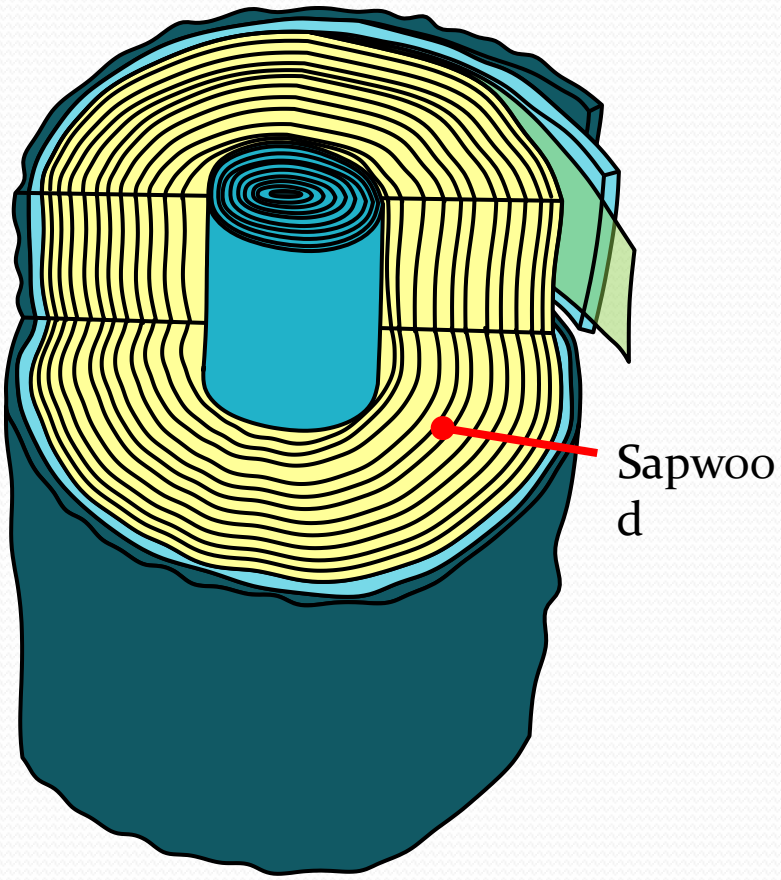
Heartwood

- **Heartwood:** Is made from dead cells. It gives the tree its strength.



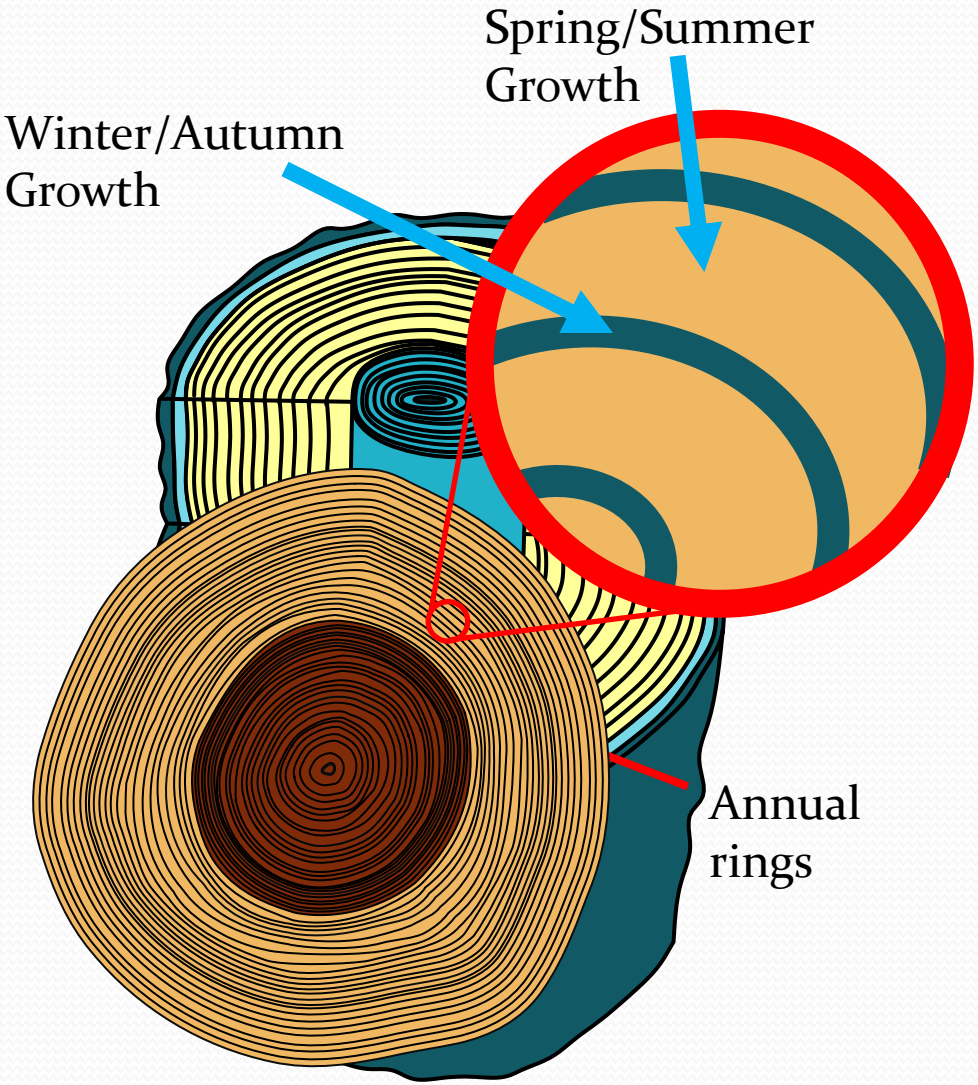
Sapwood

- **Sapwood:** Is the living part of the tree. It carries water up from the roots.



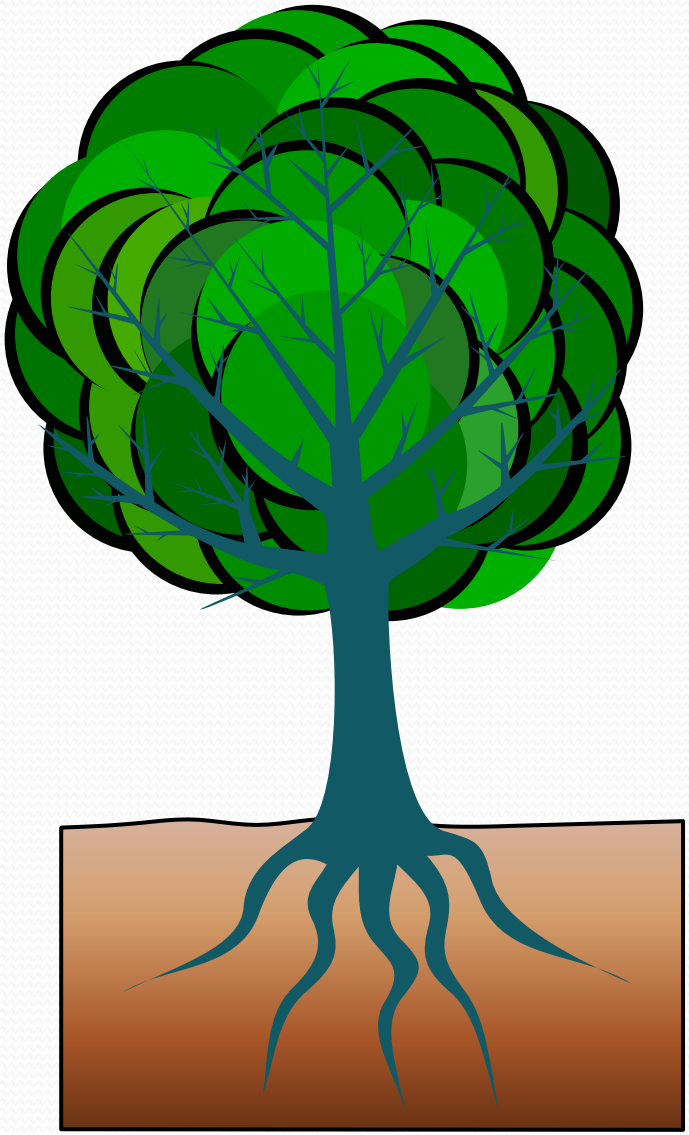
Annual Rings

- **Annual Rings:** Each ring shows one years growth.
- During spring and summer the tree grows rapidly, this creates a wide, light coloured ring.
- During autumn and winter the tree grows slowly creating a thin, dark coloured ring.



The Roots

- **The Roots:** Absorb water and minerals from the ground.



The Leaves

- **The Leaves:** Take in Carbon Dioxide and Sunlight to make food (sap) for the tree.