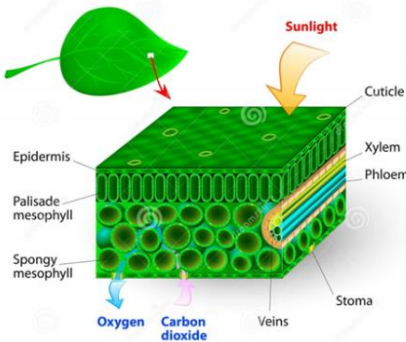


# Photosynthesis



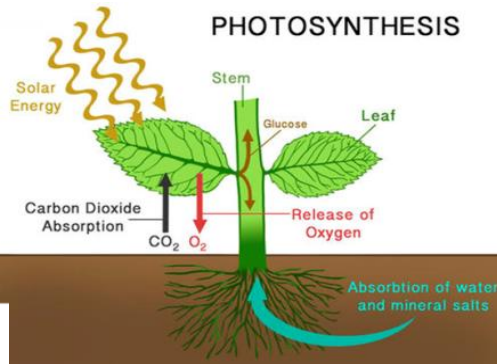
- leaves are wide and flat to create a large surface area to absorb sunlight; leaf cells contain lots of chloroplasts
- leaves are thin to allow gases to reach cells
- leaves have veins to carry water to the cells and glucose away from the cells
- leaves have stomata to allow gas exchange

## LEAF ANATOMY

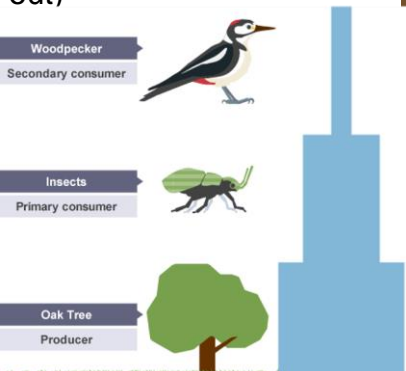


Plants store their glucose as insoluble starch, fats or oils, sucrose (sugar in fruit) or cellulose (in cell walls); or use it for **respiration** to release energy to make other substances e.g. amino acids to make proteins.

## PHOTOSYNTHESIS



A stoma is a small hole in the underside of the leaf. It allows gases to **diffuse** in and out. (CO<sub>2</sub> diffuses in, H<sub>2</sub>O and O<sub>2</sub> diffuse out)



Almost all life on Earth depends on plants and algae to make glucose and other molecules. Plants are the start of all food chains and the source of all **biomass** (the living, or once living, mass of tissue)

# Photosynthesis & Respiration

# Respiration

**Aerobic respiration** – in the presence of oxygen



- Respiration is the process of releasing energy from food (glucose)
- It occurs in mitochondria in cells.
- All species carry out respiration.
- During exercise, our muscles contract more, which requires more energy, so more respiration occurs.
- We breathe faster and deeper during exercise to absorb more oxygen and remove the extra water and carbon dioxide.
- Our heart beats faster during exercise to pump the blood containing oxygen and glucose to our working muscles.



**Anaerobic respiration** – no oxygen present; it is less efficient at releasing energy than aerobic respiration. In humans this happens during periods of intense, but brief exercise, like sprinting.

## In humans



The lactic acid builds up in our cells causing a burning sensation leaving an oxygen debt. The oxygen debt must be paid back to get rid of the lactic acid.

## In micro-organisms (yeast)



This is also called **fermentation**. It is used to make alcoholic drinks, and to make bread rise (the CO<sub>2</sub> forms bubbles in the bread to make it rise)