



6/22/2014



Cryphonectria parasitica tendrils on chestnut tree bark (Photo: Ministry of Agriculture and Regional Development Archive, Ministry of Agriculture and Regional Development, Bugwood.org)



Plant/Leaf Biology Fundamentals

B3 Summer Science Camp
at Olympic High School

Dr. Jennifer Weller

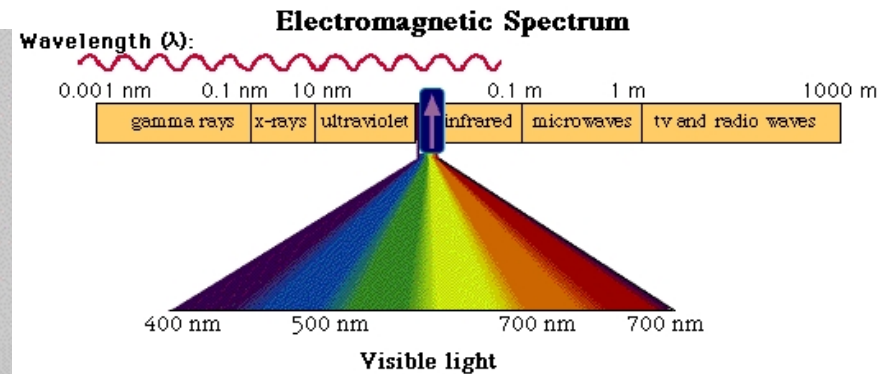
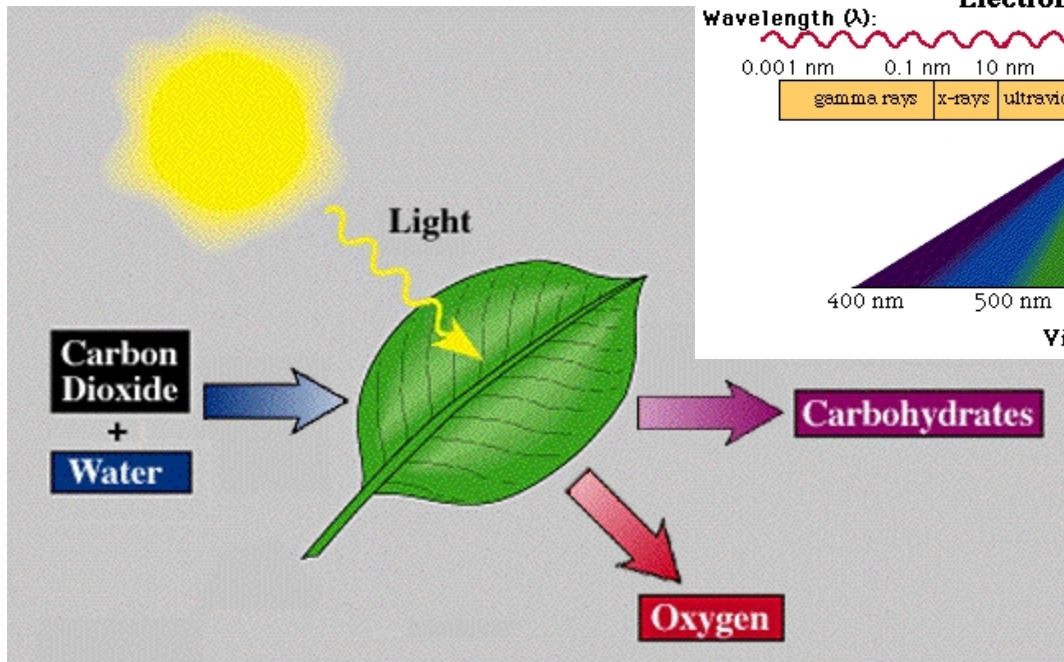
Plant Biology

- What makes an organism a plant?
- Have their own kingdom (Plantae)
 - Flowering plants
 - Conifers
 - Ferns
 - Mosses
 - Some algae
- Kingdoms are separated because the forms of the organisms are different (morphology).
 - Chemistry: cellulose in the cell walls, photosynthesize with chlorophyll.
 - Biology: multi-cellular and differentiated, developmental changes, sexual reproduction, modular/indeterminate growth, alteration of generations.
 - Lifestyle: stationary, no immune system, phototrophs

Photosynthesis

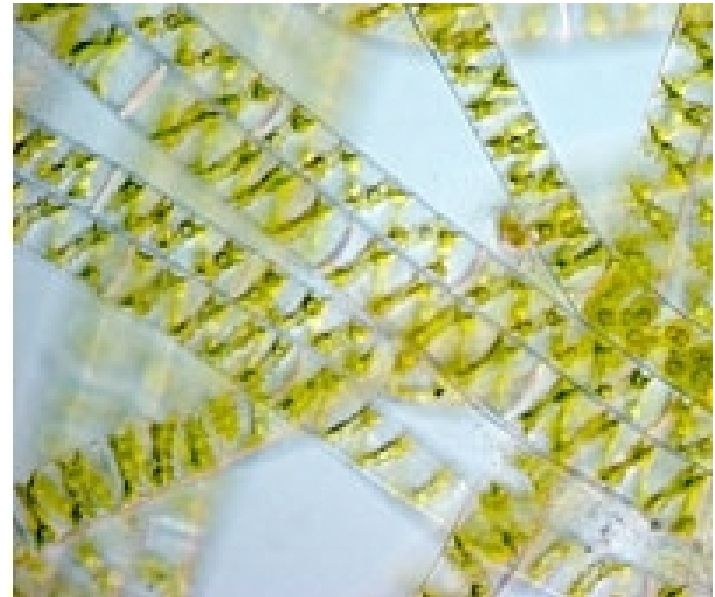
- The most important problem facing an organism: where does my energy come from?
 - Plants use a chemical process called photosynthesis.

$$E = mc^2$$



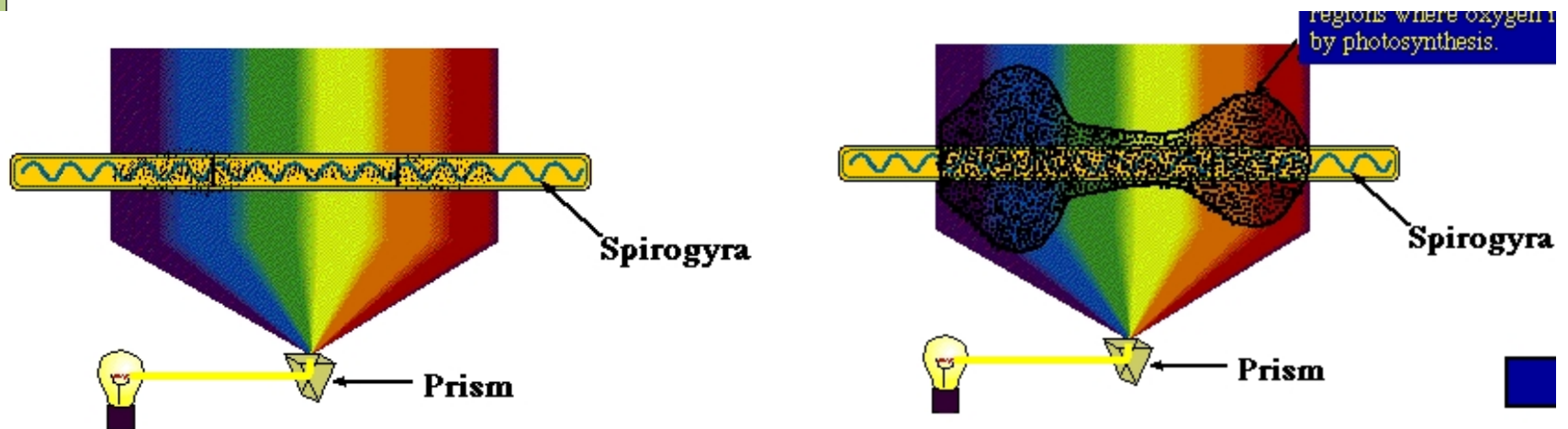
Capturing photons

- Different plants select different sets of photons as the energy source
 - Why is this an advantage (think competition)
 - How do you figure out what photons are used by the plant?
 - What experimental design can you think of to test this?



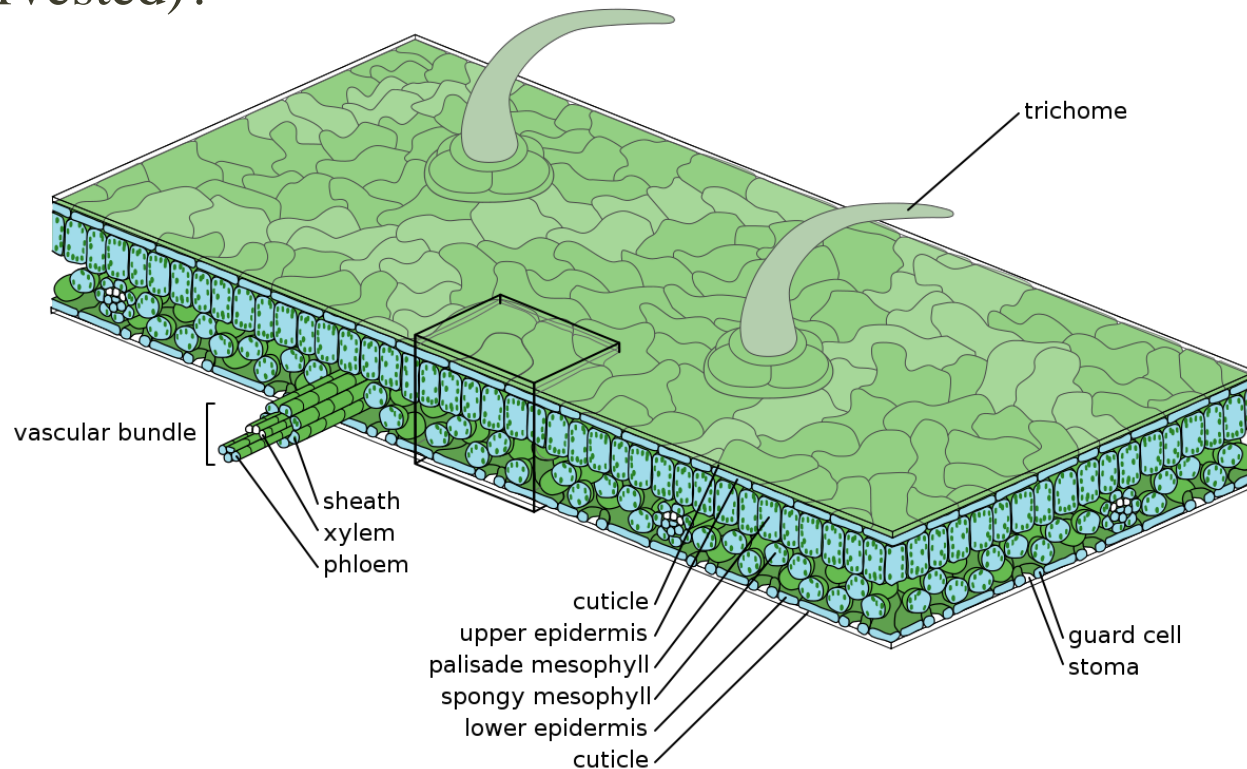
The Spirogyra Experiment

- In water the oxygen collects as bubbles on the leaf surface – there is a high local concentration of oxygen
- There are bacteria that need the oxygen to survive
- A prism can be used to select the wavelength of light that illuminates the aquarium.



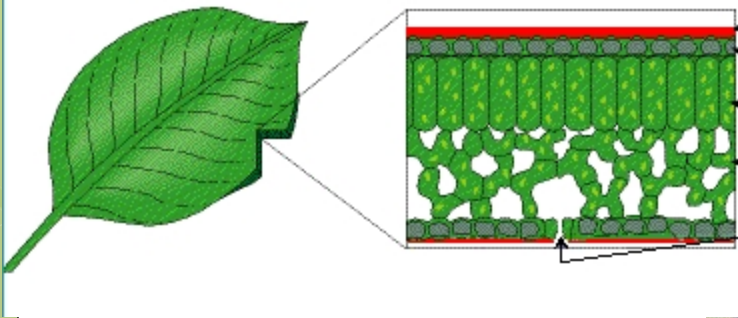
Leaf Structure

- If you think of organisms as machines – they have parts with particular functions
- What is the function of each part of the leaf (the part we harvested)?

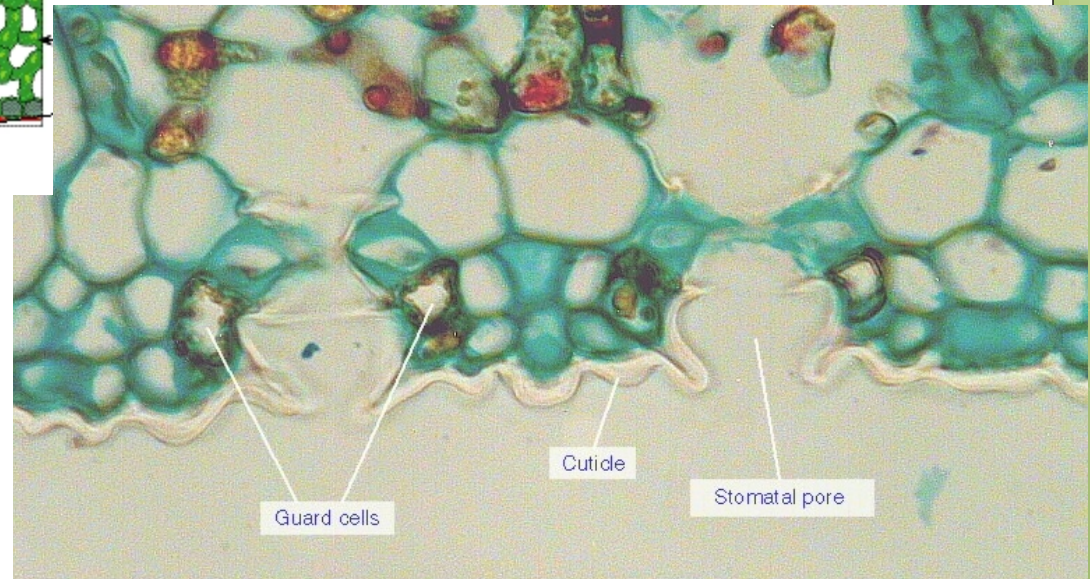


Leaf Cells

- If you think of organisms as machines – they have parts with particular functions
 - What is the function of each part?



Cuticle
Upper epidermis
Spongy mesophyll
Palisade Mesophyll
Stoma



Plant Types

- Why are plants central to land ecology?
- What toxic compound do plants produce the most of?
- How many species of plants are there?

Phototrophs
Heterotrophs
Chemotrophs

