

# B3- Olympic High School Science Camp

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# Plant Biology

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- **Plants 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

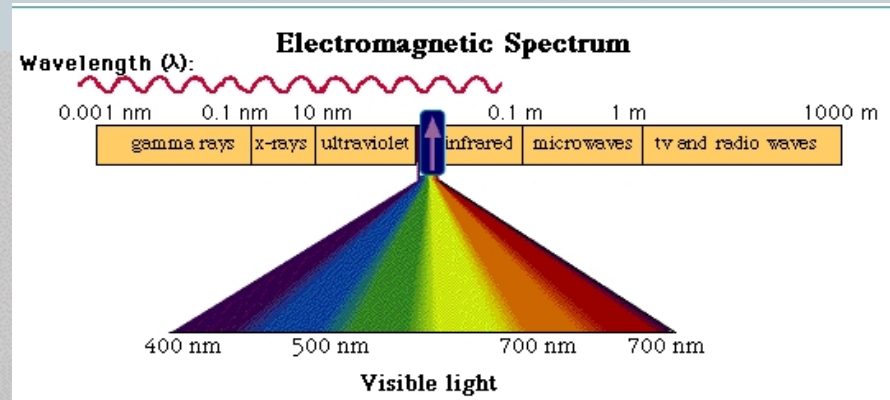
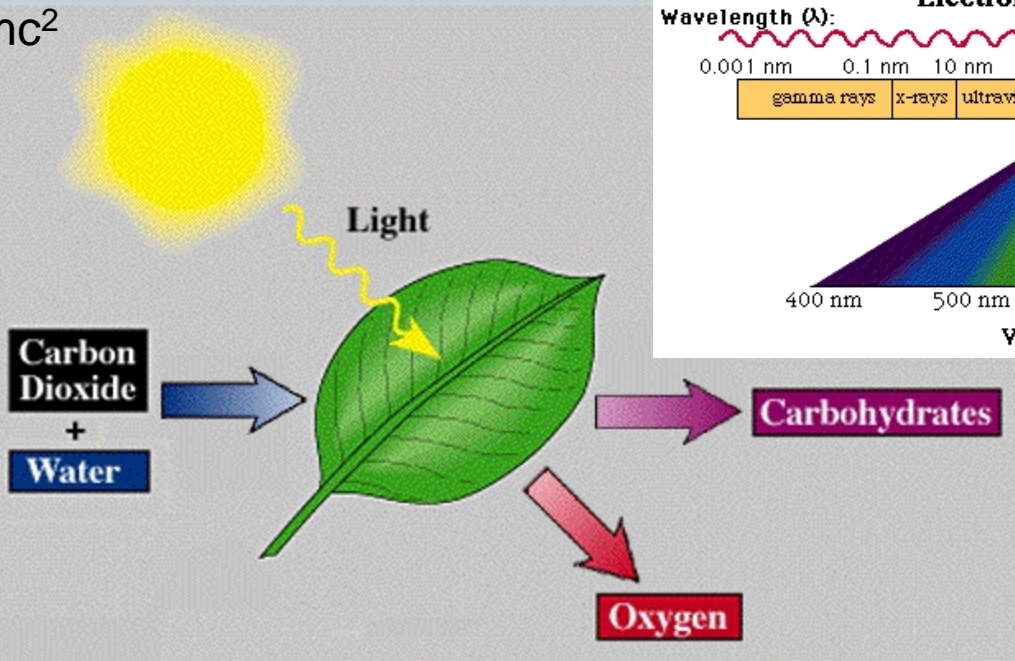
# Photosynthesis

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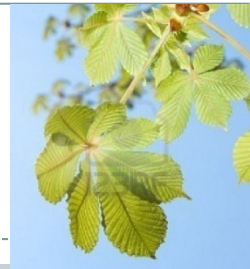
- The most important problem facing an organism: where does my energy come from?
  - Plants use a chemical process called photosynthesis.

$$E = mc^2$$

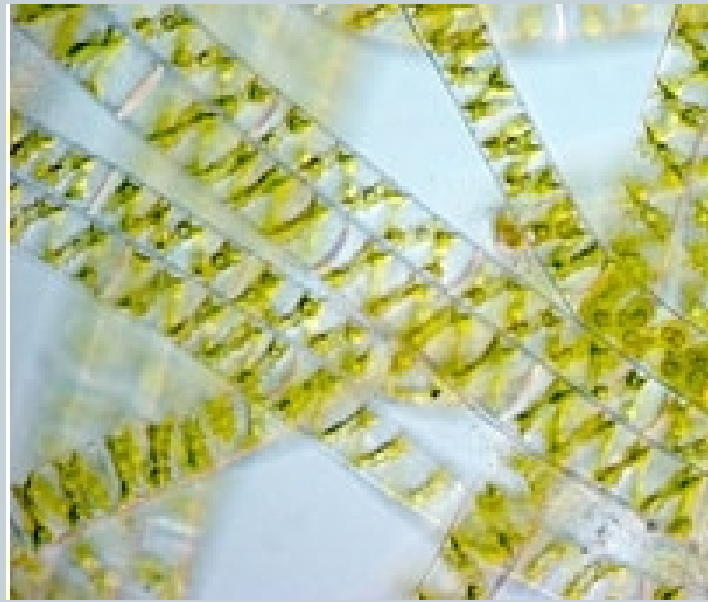


# Capturing photons

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- 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?
    - ✦ Experimental Design

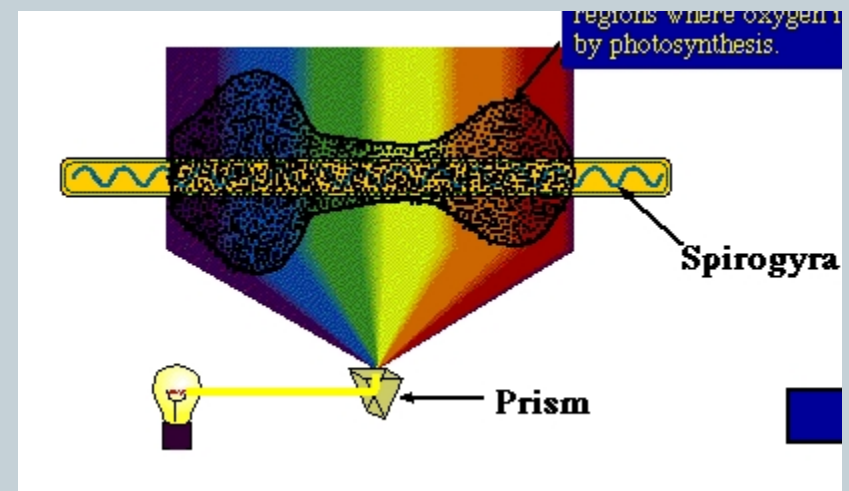
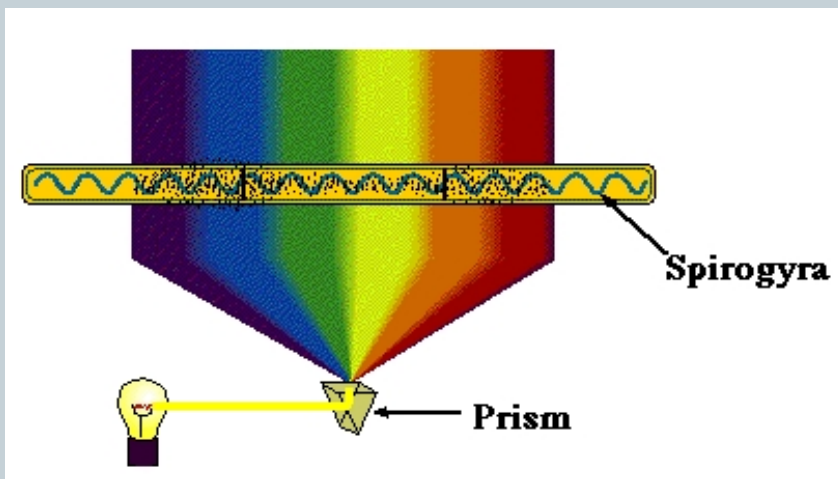


# The Spirogyra Experiment

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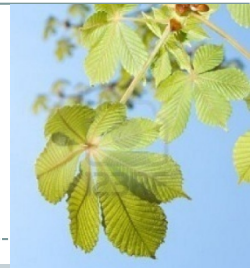
- In water the oxygen collects as bubbles on the leaf surface –there is a high local concentration of oxygen
- There are bacteria that need the oxygen to survive
- A prism can be used to select the wavelength of light that illuminates the aquarium.



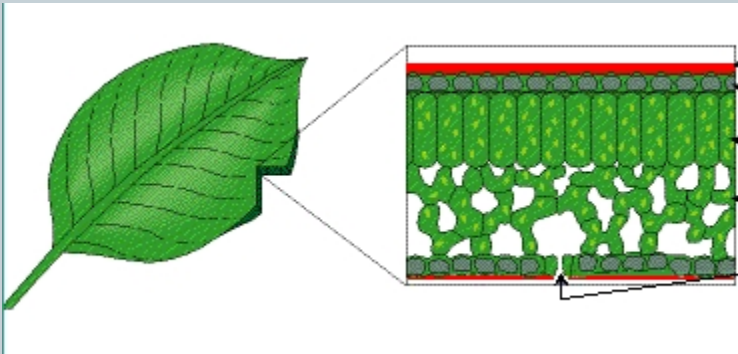


# Cell Biology of Plants

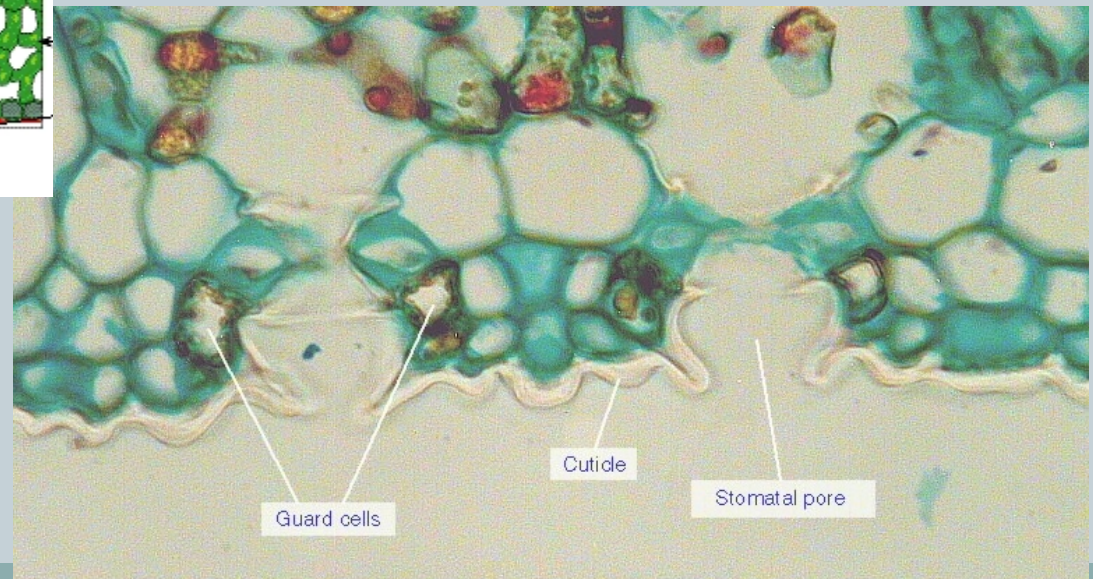
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- If you think of organisms as machines – they have parts with particular functions
  - What is the function of each part?

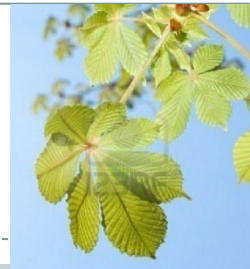


Cuticle  
Upper epidermis  
Spongy mesophyll  
Palisade Mesophyll  
Stoma



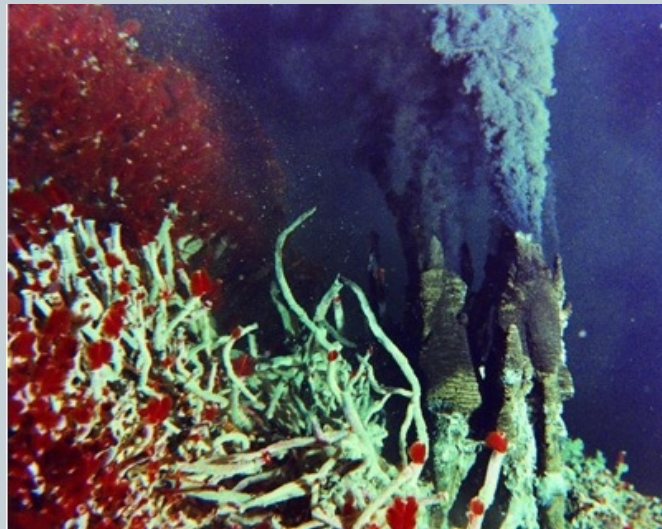
# Plant Biology

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

Source of energy:  
Phototrophs  
Heterotrophs  
Chemotrophs



# Creating offspring

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- **Plants are things that don't move on their own. What types of problems does this present for survival of the organism and producing offspring?**
  - Overcome predation
  - Overcome bad weather/toxic environment
- **Plants don't have an immune system- what types of problems does this present?**
  - A specific response has to be inherited
  - A general response requires a large arsenal of chemicals