

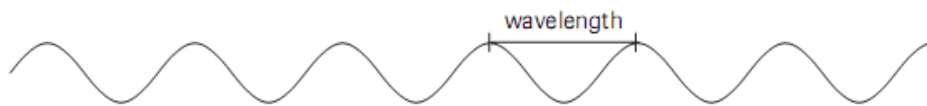
Photosynthesis - Lesson 1 - Solar Energy and Chloroplasts

Questions we will answer today:

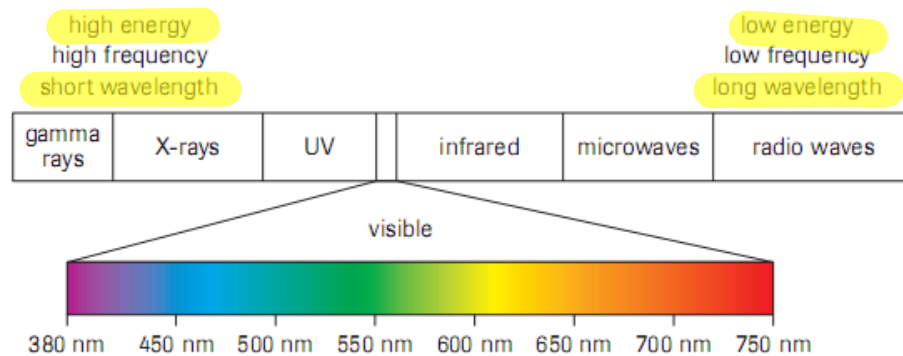
- What is solar energy?
- What is chlorophyll?
- What is the structure of a chloroplast?

What is solar energy? (pg 180)

- solar energy is energy from the sun
- solar energy is a mixture of many different types of electromagnetic radiation (EMR)
- all EMR occurs as photons of a certain wavelength
- different types of EMR have different wavelengths



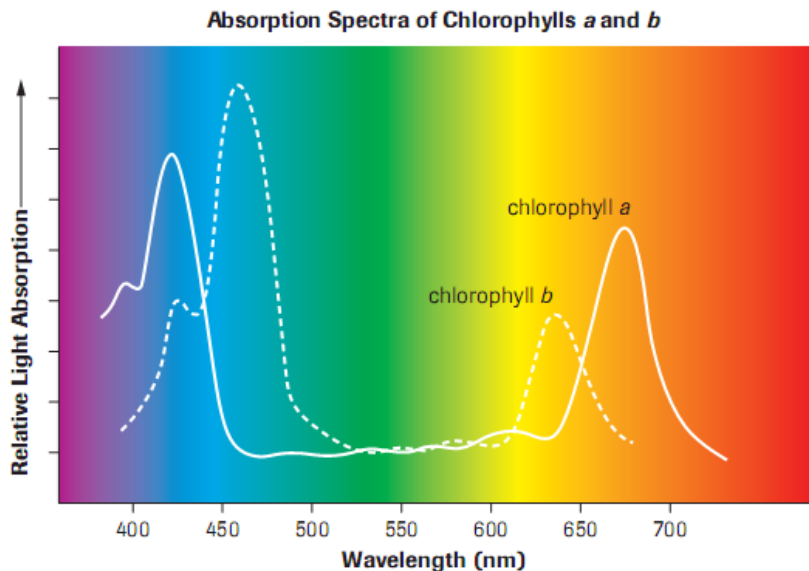
- Most of the EMR spectrum is invisible to humans, and the visible light portion of it is very small



- Pigments in plants absorb visible light to provide the energy for photosynthesis

What is chlorophyll? (pg 181 - 182)

- All organisms that perform photosynthesis have one thing in common - they contain chlorophyll
- Chlorophyll is a green-colored pigment in plants that absorbs light energy
- The two most common types of chlorophyll are **chlorophyll *a*** and **chlorophyll *b***
 - chlorophyll *a* is the only pigment that can pass light energy along in photosynthesis
 - all other pigments are accessory pigments and they give the energy they absorb to chlorophyll *a*
- Chlorophyll *a* and *b* absorb photons in the blue-violet and red regions of the EMR spectrum



http://www.nelson.com/ABbio2030/teacher/protect/otr/Bio2030OTR/attachments/i_AnimationSimulation/light_wavelength.html



- Why are plants green?
- Why do leaves turn yellow/orange in the fall?

What is the structure of a chloroplast? (pg. 183)

- To undergo photosynthesis, a plant cell must,
 - contain chlorophyll
 - must be able to obtain carbon dioxide and water
 - must be able to capture solar energy from its environment
- Plant cells contain chlorophyll within the organelles called **chloroplasts**
- Lots of chlorophyll is found in leaves, stems, and unripened fruit, which gives them their green color.

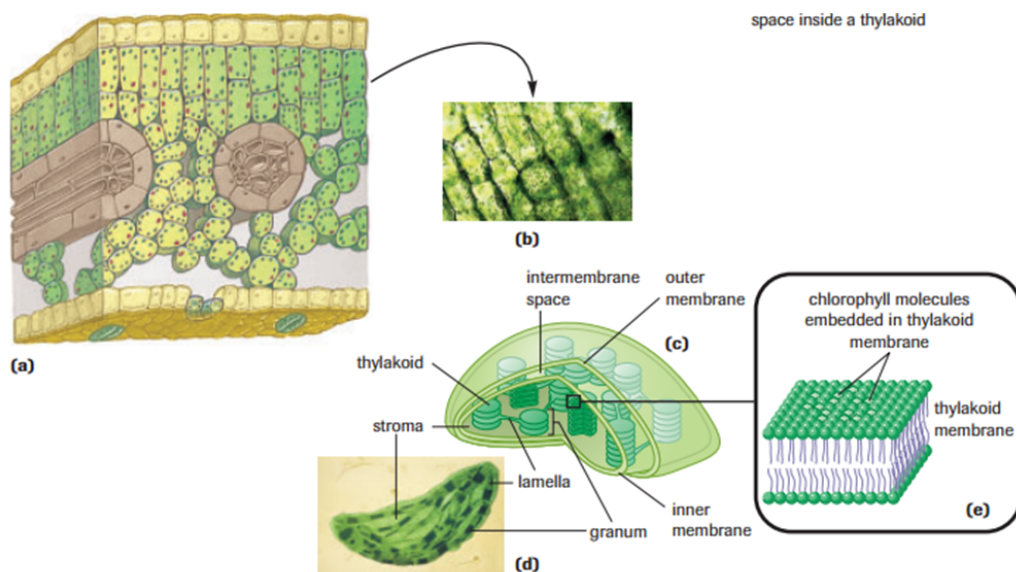


Figure 6
(a) Leaf cross section with mesophyll cells containing chloroplasts
(b) Chloroplasts within plant cells
(c) An artist's representation of a chloroplast, showing key components
(d) An electron micrograph of a chloroplast
(e) Chlorophyll molecules in the thylakoid membrane

http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i_AnimationSimulation/chloroplast.html

- **stroma** - the protein-rich semiliquid material in the interior of a chloroplast
- **thylakoid** - a system of interconnected flattened membrane sacs forming a separate compartment within the stroma of a chloroplast
- **grana** (singular: granum) - stacks of thylakoids
- **thylakoid membrane** - the photosynthetic membrane surrounding a thylakoid that contains chlorophyll
- **thylakoid lumen** - the fluid-filled space inside a thylakoid