

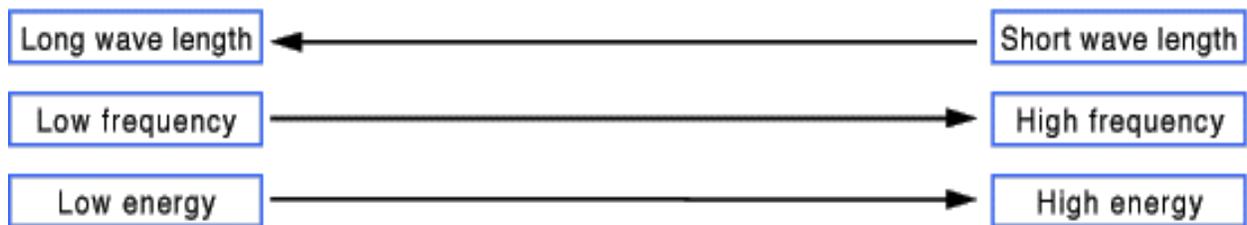
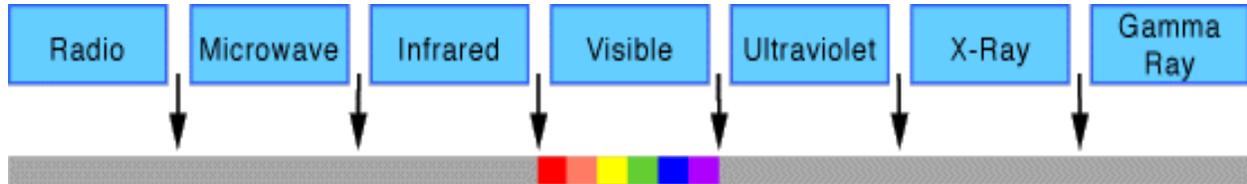
## Photosynthesis In-depth

### The sun produces all energy for the Earth.

- Plants capture only about \_\_\_\_\_ of that energy.
- Photosynthesis evolved in \_\_\_\_\_ over 3 billion years ago.
- It has changed the Earth's \_\_\_\_\_ by adding \_\_\_\_\_.

### Properties of Light

- Light is a form of \_\_\_\_\_.
- The visible light spectrum include the \_\_\_\_\_ of light we can see.



### Chlorophyll

- \_\_\_\_\_ absorb light energy, exciting the pigment's \_\_\_\_\_.
- \_\_\_\_\_ is a pigment that absorbs \_\_\_\_\_ & \_\_\_\_\_ light and reflects \_\_\_\_\_ light.
- There are other \_\_\_\_\_ in leaves.
- Chlorophyll a & b, carotene (red-orange), xanthophyll (yellow) are most common.
- Chlorophyll is found in the \_\_\_\_\_ of plants.
- When light hits the chlorophyll pigments' \_\_\_\_\_ become excited and "jump" to nearby proteins.

### Photosynthesis accomplishes 3 things.

- Energy \_\_\_\_\_.
- Making of \_\_\_\_\_ and \_\_\_\_\_.
- \_\_\_\_\_ construction.

### Photosynthesis is divided into 2 parts

- **Light Dependent** reactions (light reactions)
- **Light Independent** reactions (dark reactions)

### Light Dependent Reactions

- \_\_\_\_\_ light
- Occurs in the \_\_\_\_\_ of the chloroplast.
- Light energy is \_\_\_\_\_ and used to make \_\_\_\_\_ compounds (NADPH and ATP)
- Light energy causes \_\_\_\_\_ in pigment molecules to \_\_\_\_\_ to other pigment molecules until the \_\_\_\_\_ is reached.
- Electrons from \_\_\_\_\_ replace those that were removed from chlorophyll.
- \_\_\_\_\_ ion gradient will be used to make ATP and NADPH.
- \_\_\_\_\_ atoms will be used to make glucose.
- \_\_\_\_\_ atoms will form O<sub>2</sub> which will be released into the air.

### Light Independent Reactions

- Does not \_\_\_\_\_ light to work.
- Only need \_\_\_\_\_ and \_\_\_\_\_ made in the Light Dependent Reactions.
- \_\_\_\_\_ is used to make organic molecules.
- Reactions form a cycle called \_\_\_\_\_.
- Calvin Cycle produces \_\_\_\_\_ molecules.
- Molecules are \_\_\_\_\_ to be used later in the cycle.
- Only \_\_\_\_\_ carbon atom can be added each turn of the cycle.
- It will take \_\_\_\_\_ turns of the cycle to produce 1 glucose.

### Summary

Photosynthesis captures light energy.

Photosynthesis has two parts

- 
- Light is required.
  - \_\_\_\_\_ captures the light energy and transfers electrons through photosystems.
  - \_\_\_\_\_ water
  - Produces \_\_\_\_\_ released in the air.
  - Uses hydrogen ion \_\_\_\_\_ to produce \_\_\_\_\_ and \_\_\_\_\_
  - \_\_\_\_\_ and \_\_\_\_\_ are electron carriers used in the Light Independent reactions.

- 
- Light is NOT required.
  - Occurs in the \_\_\_\_\_
  - \_\_\_\_\_ is used to make organic compounds
  - \_\_\_\_\_ adds one carbon per turn of the cycle to the organic compounds.
  - It takes \_\_\_\_\_ turns of the cycle to make one glucose.

# Chloroplast

