

Photosynthesis – Using Light to create sugar

http://www.mhhe.com/biosci/bio_animations/02_MH_Photosynthesis_Web/

Light is both a _____ and a _____. Light from the Sun is a wide range of wavelengths, called the _____. The type of light used in photosynthesis is the _____ light spectrum.

Pigments in leaves absorb and reflect different types of visible light. _____ and _____ light are reflected, causing us to see leaves as a particular color. _____ and _____ are absorbed, transferring energy to chemical bonds.

Plant cells have an organelle where photosynthesis takes place. These are called _____. Inside these structures are thin disk like structures called _____. These are surrounded by space called the _____.

Photosynthesis has two types of reactions. The _____ happens in the stroma. The _____ reactions happen in the inner membrane of the thylakoid.

Light Dependent Reaction take place in sets of proteins called photosystems.

Photosystem I -
1. _____ is broken up and dumps e⁻ into the photosystem
2. _____ energizes the e⁻
3. _____ move from the stroma to inside the thylakoid

Photosystem II -
1. _____ are re-energized by light
2. _____ picks up e⁻ and H⁺ to become _____

ATP Synthase - _____ move through this molecule to create _____

The Light Dependent Reaction produces _____ and _____.

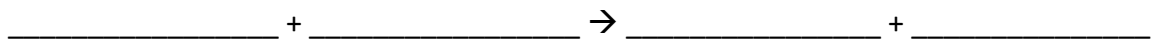
The Calvin Cycle, which was often called the Dark Reactions in the past, does not need light, but it uses the products of the Light Dependent Reactions. There are three steps.

1. Carbon Fixation – carbon from _____ is put into molecules that will eventually become either sugar or other molecules the plant uses.

2. Reduction - _____ from NADPH and ATP create more rearrangements of atoms, creating more molecules. One in particular, G3P (glyceraldehyde 3-phosphate) will become very important.
3. Regeneration of RuBP - the molecule that CO₂ combines with at the start of the Calvin cycle called RuBP (Ribulose 1,5-biphosphate) is regenerated to start the cycle again.

Not all of the G3P is used to make RuBP. For every 3 G3Ps made, one is taken out of the cycle. Two are used to make _____. It takes _____ times through the Calvin cycle to produce one molecule of _____.

The Big Idea equation for Photosynthesis is



1. Compare and contrast cellular respiration and photosynthesis.
2. Cellular respiration occurs in BOTH plants and animals. Why do plants need cellular respiration?
3. Plants produce carbon dioxide as a product of cellular respiration. But you know that plants release oxygen, not carbon dioxide. Develop a logical argument for how this is possible.
4. Plants can make their own food through photosynthesis and then break it down for usable energy through the process of cellular respiration. Analyze how your life might be different if you could make your own food through photosynthesis.