

Photosynthesis *WebQuest*

Name _____

Pd _____

Directions: Follow the steps below to answer each question, and place a in each box as you complete the step.

Part I: Illuminating Photosynthesis

- Type or click on the link below:

<http://tinyurl.com/jpphwq1>

Or you can type in: <http://www.pbs.org/wgbh/nova/methuselah/photosynthesis.html#>

- Read the introduction entitled "Illuminating Photosynthesis" by Rick Groleau

- Click on the link that reads: "**Launch interactive.**"

- Read the introductory poem.

- Click on "**The Cycle**" at the top of the box

1. Click on each of the following items, and explain what happens:

a. The **shade** over the **window**: _____

b. The **container** of **water**: _____

c. The **child**: _____

2. a. What **gas** does the child provide for the plant to use? _____

b. What **gas** does the plant provide for the child to use? _____

c. Will the plant continue to produce this gas if the shade over the window is closed? (try it out to see!)

3. According to this animation, what 3 main things does the plant need for **photosynthesis** to occur?

(1) _____

(2) _____

(3) _____

Click on "**The Atomic Shuffle**" at the top of the box.

Read the introductory poem, and click on "**next**"

4. What type of molecule is shown in the leaf? _____

5. Draw one of the molecules below, as it is shown in the leaf.



6. According to the reading, these molecules "do not come from the tap." What two places do they come from?

(1) _____ (2) _____

Click on "**next**" and watch carefully. You may click on "**replay**" to watch this again.

7. a. What is "stripped" from each water molecule?

b. From where does the cell get the energy to do this? _____

c. The stripped molecules form pairs. Where does it go after this?

Click on "**next**"

8. a. What gas enters the leaf? _____

b. This gas enters through "holes" in the leaf. What are they called? _____

Click on "**next**"

9. What molecule is formed **once again**? _____

Click on "**next**"

10. Another molecule is formed (“and boy is it sweet”). Draw this molecule below as shown.



11. What is the name of this molecule? _____

Click on “**Three Puzzlers**” at the top of the box.

12. Answer each of the following questions, and explain *in your own words*.

a. Can a tree produce enough oxygen to keep a person alive? Explain.

b. Can a plant stay alive without light?

c. Can a plant survive without oxygen? Explain.

- Exit out of “Illuminating Photosynthesis” and return to the original website with the links on it:

Part II: Photosynthesis & Light

- Type or click on the link below:

<http://tinyurl.com/9pkuy>

Or you can type: http://www.mhhe.com/biosci/genbio/biolink/j_explorations/ch09expl.htm

Give it a few minutes to come up; shockwave files may take some time to load.

- Study the diagram carefully.
- When done click on skip intro
 - You can adjust two controls, the wavelength of light and the light intensity
 - ATP production can be determined by looking at either the % maximal ATP gage or number of ATP. Both can found on the upper left side of the picture
- Do not adjust the light intensity settings (100)
- Adjust the wavelength of light to 425 nm and press the start button; let it run for a relative time of **at least 00.50 min/sec (50 seconds)** then press stop
 - Note how much ATP is produced and % of maximal ATP and write these values down in the table below
 - Repeat this procedure for the wavelengths listed below

Wavelength (nm)	Number of ATP produced	% of maximal ATP
425 nm		
500 nm		
575 nm		
600 nm		
625 nm		
650 nm		
700 nm		
750 nm		

- At what wavelength is the most ATP produced? (Hint: look at % of maximal ATP)

- What color is that?

2. At what wavelength is the least amount of ATP produced? (Hint: look at % of maximal ATP)

a. What color is that?

b. Why does this wavelength produce the least amount of ATP?

- Set the wavelength bar to the wavelength where you discovered produced the most ATP. Now adjust the light intensity to 20 and press the start button; let it run for a relative time of **at least 00.50 min/sec** then press stop. Record the results in the table below
- Adjust the light intensity to 180 and repeat and record your results

Light Intensity	% of maximal ATP
20	
180	

3. What happen to the ATP production as you increased the light intensity?

4. Explain why on a cloudy day plants do not produce less ATP

Part 3 – Photosynthesis Overview

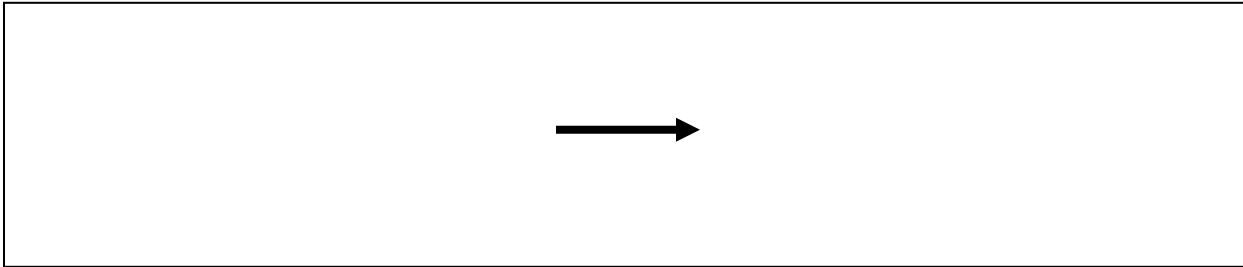
Type the link below

<http://tinyurl.com/25qs8z2>

Or you can type: <http://biology.about.com/od/plantbiology/a/aa050605a.htm>

Read the entire page

1. Write the overall chemical equation for photosynthesis in the space below. You may use the molecular formulas or words.



1. What type of organisms can also undergo photosynthesis

2. In what part of the plant does photosynthesis occur? _____

3. Water is obtained by the plant through the roots how is it delivered to the leaves?

4. What part of the chloroplast is involved with conversion of carbon dioxide to sugar?

5. What part of the chloroplast is involved with conversion of light energy into chemical energy?

6. What is carbon fixation?

7. What are the two end products of photosynthesis?