

Biology



Learning goal: Trace the steps of photosynthesis from a photon of light through production of glucose.

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**Check your answers to the Photosynthesis word search questions.
Notebook check 11: checking the word search and questions for completion.**

Contrast the differences between:

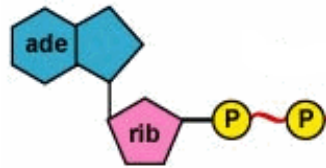
1. Chlorophyll and Chloroplasts

Chlorophyll is a pigment in plants that absorbs light. Chlorophyll is found in the membrane of a thylakoid. Thylakoids are found in organelles called chloroplasts.

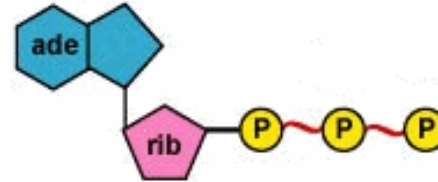
2. ADP and ATP (draw an image of each)

ADP is a molecule with two phosphates and ATP is a molecule with three phosphates.

ADP:



ATP:



3. Stroma and thylakoid

Stroma is the connective tissue that surrounds and supports thylakoids in a plant cell chloroplast.

4

Variable outcomes by altering equation

3

Equation + ATP and NADPH w/ light and dark

2

Equation + ATP and NADPH

1

Inputs and outputs

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Check your answers to the Photosynthesis word search questions.

List the inputs and outputs each of the following photosynthetic reactions

1. "Light reaction"

Inputs: light energy and water

Outputs: chemical energy and oxygen

2. "Dark reaction"

Inputs: Chemical energy and carbon dioxide

Outputs: Organic compounds (sugar and starch)

3. Which of the above reactions is more vital to the completion of photosynthesis and why?

They are equally import; photosynthesis could not occur without both processes functioning.

4. Calvin cycle

Inputs: Chemical energy (ATP, NADPH) and carbon dioxide

Outputs: Organic compounds (sugar and starch)

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Check your answers to the Photosynthesis word search questions.

Contrast (explain) the difference between

Explain how the following relate

1. Electron transport chain the Thylakoid membrane

The electron transport chain travels along the thylakoid membrane.

2. Catalyst and ADP

A catalytic reaction converts ADP into ATP.

3. Hydrogen ion and Gradient

Hydrogen ions are pumped into the thylakoid against their concentration gradient. Once inside they increase the internal ion concentration of the thylakoid with hydrogen ions produced from the splitting of water molecules in the thylakoid.

4. Carbon dioxide and Calvin cycle

Carbon dioxide is an input into the Calvin cycle.

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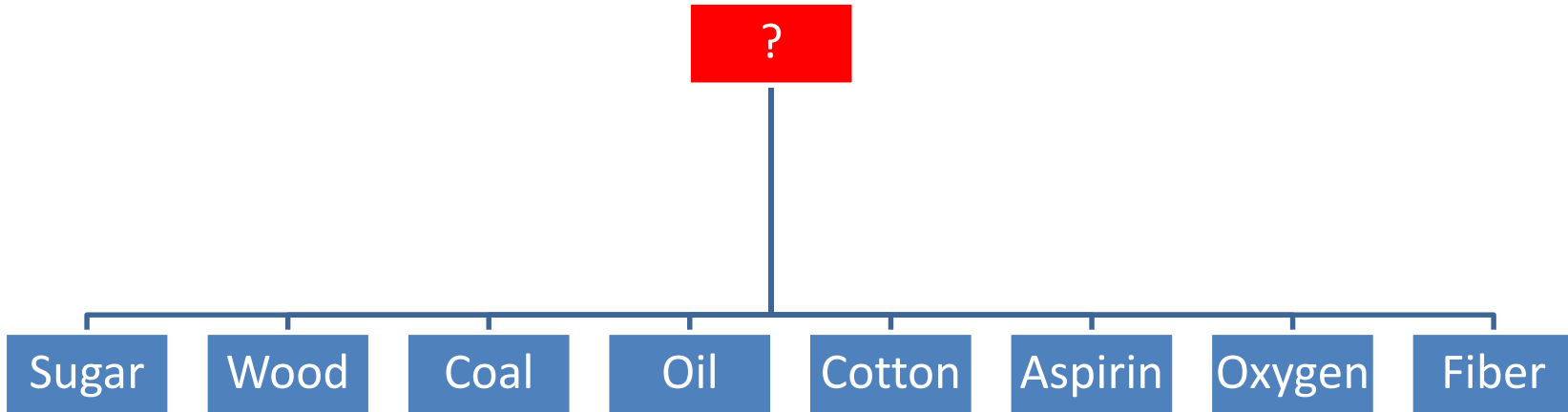


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Warm-up: Copy the chart below. What belongs in the red box – what is the origin of the resources found in each of the blue boxes?



4
Variable
outcomes
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Learning scale:

1	2	3	4
List the products and reactants of photosynthesis	Write a balanced equation for photosynthesis and indicated the importance of ATP and NADPH	Write the equation for photosynthesis with in and out put of ATP/NADPH and differentiate between light and dark reactions.	Use data to show the effects of variable inputs on outputs of photosynthesis and predict alterations in ATP and NADPH based on availability of light and dark.

Student's self-evaluation: Complete at home or at the end of class, use the *4-3-2-1 Learning scale (two to three sentences).*

Homework: none.

4 Variable outcomes by altering equation
3 Equation + ATP and NADPH w/ light and dark
2 Equation + ATP and NADPH
1 Inputs and outputs

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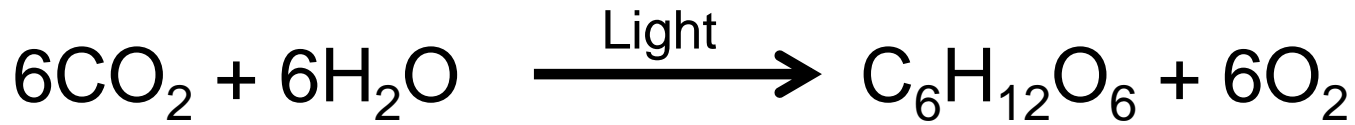


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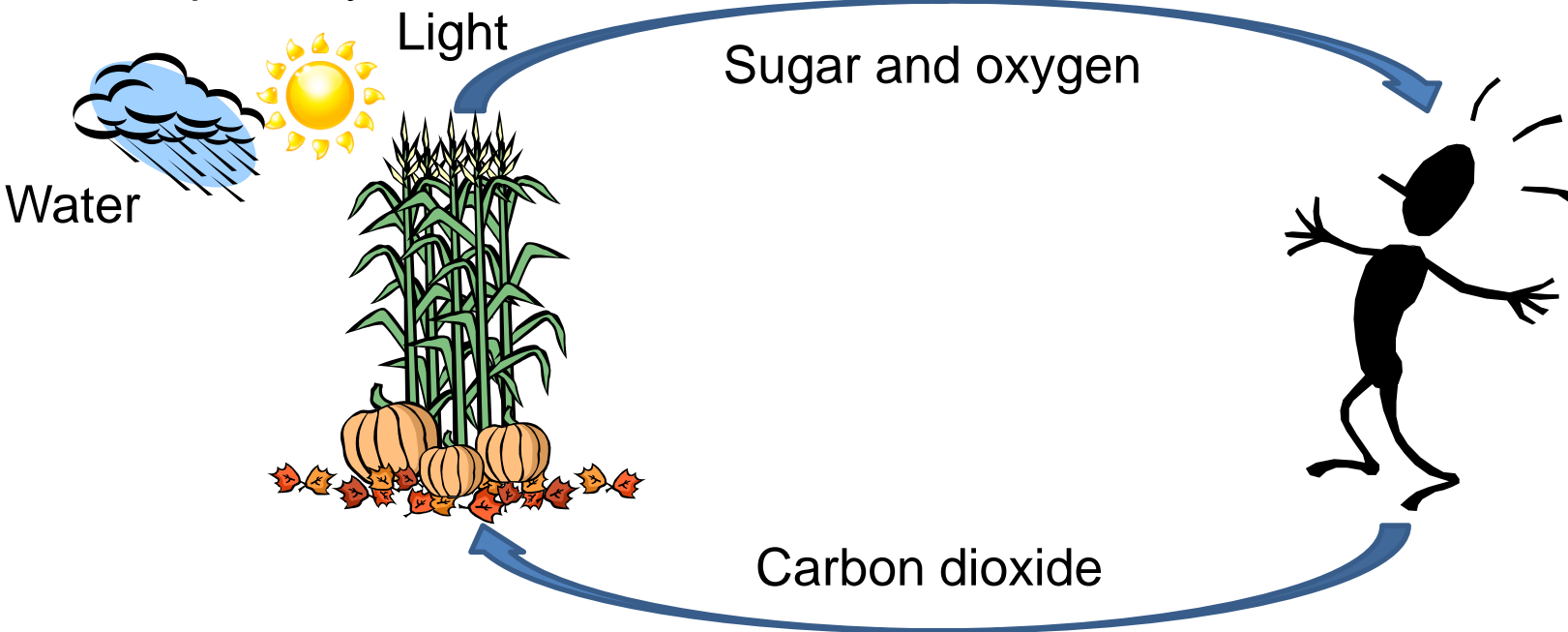
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The equation of photosynthesis



Role of photosynthesis



4

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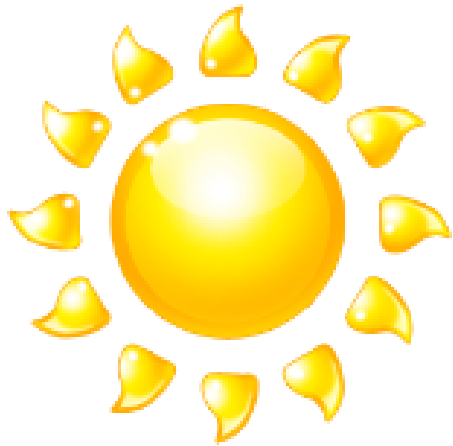
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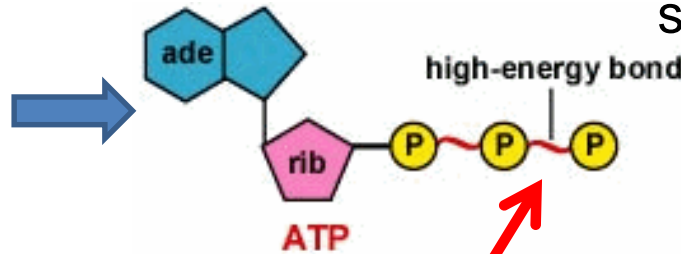
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Stages of photosynthesis

1. Energy from sun is captured by a plant



2. Light energy is *changed* into chemical energy (ATP, NAHPH)



Stores energy in chemical bonds

3. Chemical energy powers creation of “organic compounds” (carbohydrates and sugars).



4	Variable outcomes by altering equation
3	Equation + ATP and NADPH w/ light and dark
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Biology



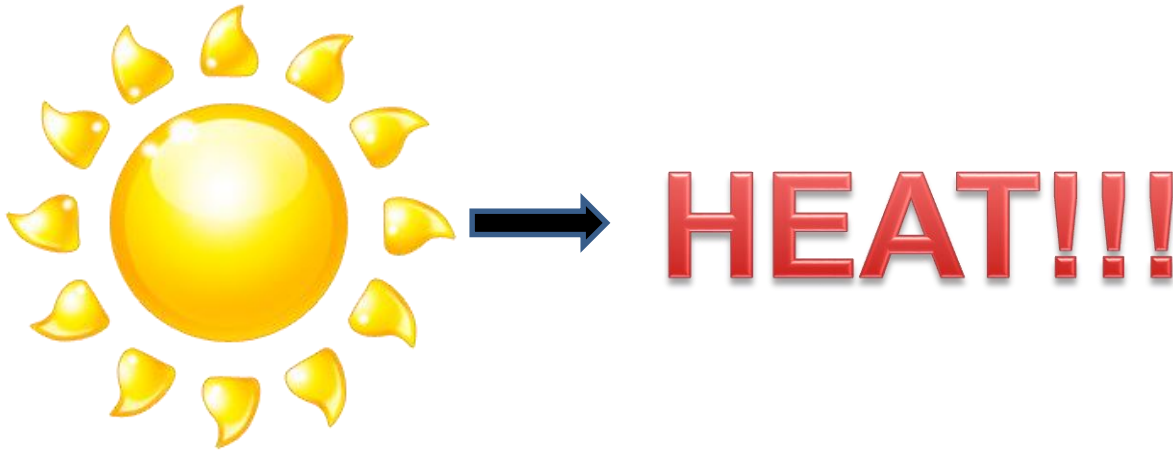
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1. Energy from sun is captured by a plant

- Sunlight = Energy
- Light is a type of radiation that travels in photons
- People feel the energy in sunlight in the form of heat energy



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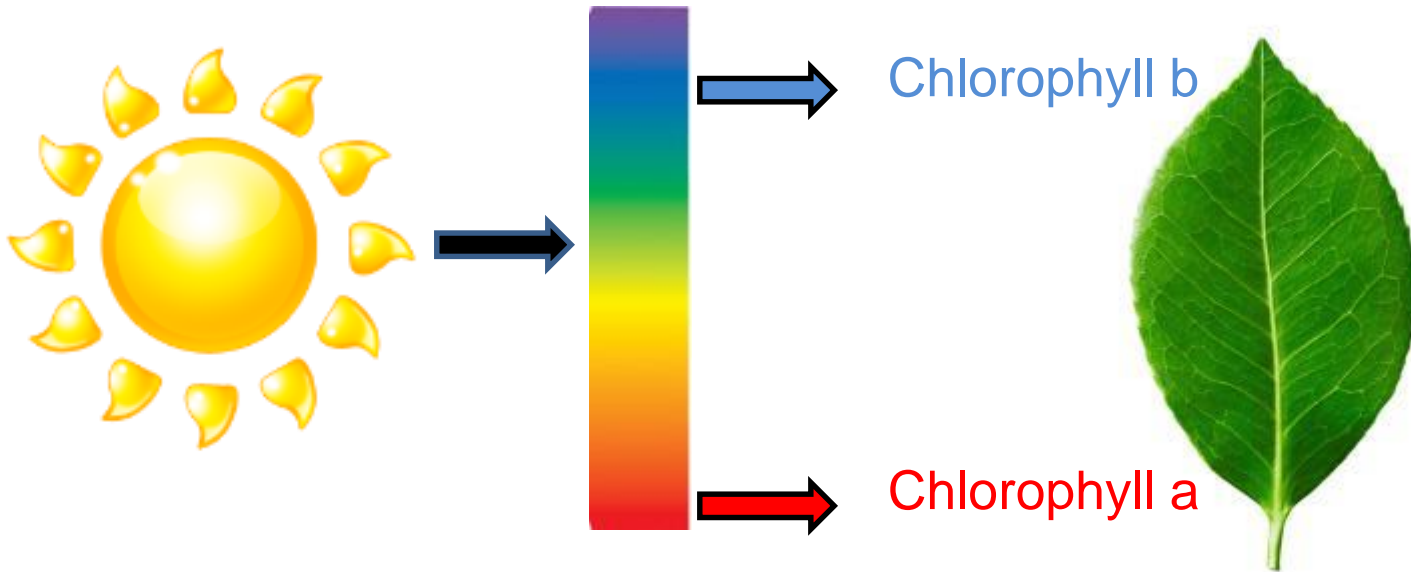
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1. Energy from sun is captured by a plant

- Plants use pigments called chlorophyll to capture energy in different wavelengths of light
- Chlorophyll **b** absorbs **BLUE** and chlorophyll **a** absorbs **RED** light



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1. Energy from sun is captured by a plant

- Pigments are found in the chloroplasts plant
 - Chloroplasts are the site of photosynthesis in a plant
 - The thylakoid contains the light absorbing pigments (**Chlorophyll b** and **Chlorophyll a**)

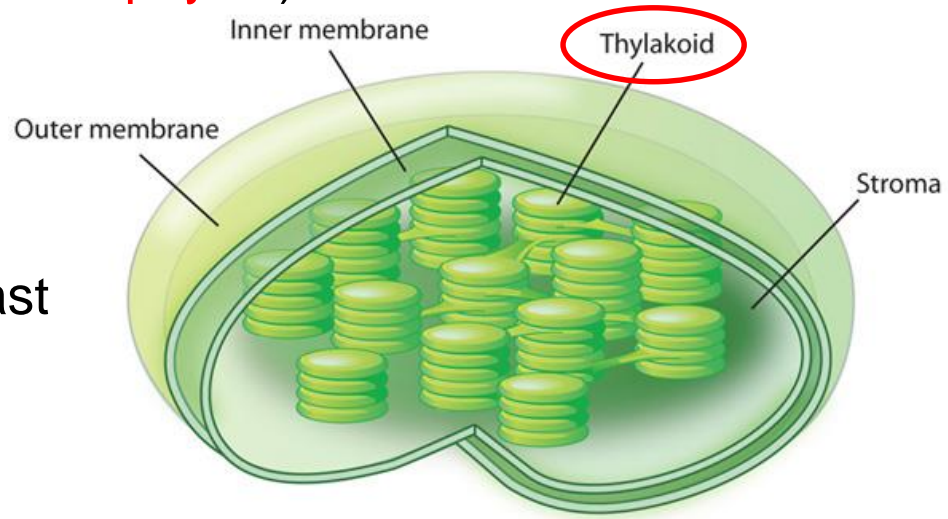


Figure 1: plant chloroplast

4

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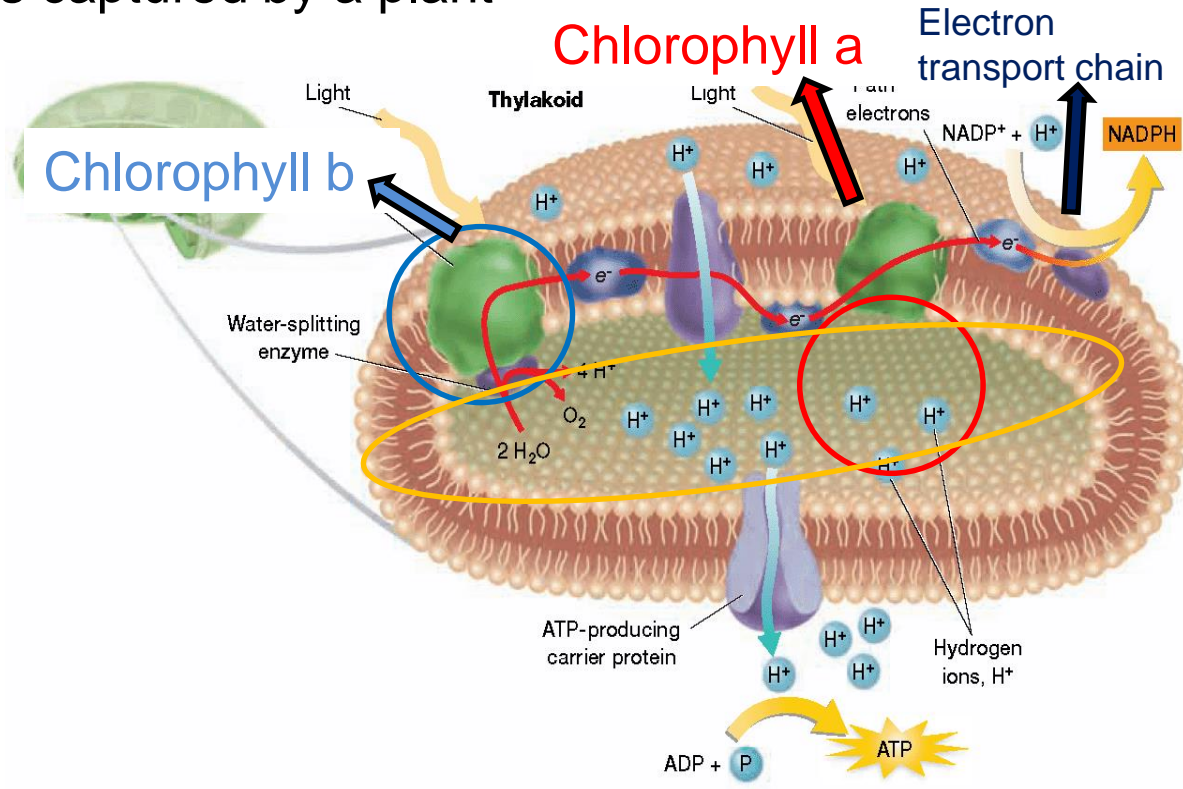
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1. Energy from sun is captured by a plant

Figure 2: thylakoid



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https://youtu.be/joZ1EsA5_NY

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Homework: Finish questions 1 – 6 on page 103 in the textbook. Answer in complete sentences on page 08 of your notebook.

4

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2

Equation + ATP and NADPH

1

Inputs and outputs