

Name \_\_\_\_\_ Hour \_\_\_\_\_ Date \_\_\_\_\_

### **Illuminating Photosynthesis Interactive**

**Learning Objective:** Use models to illustrate and explain how photosynthesis transfers energy.

The interactive can be found at the following website:

<https://www.pbs.org/wgbh/nova/interactive/illuminating-photosynthesis/>

#### **Part 1: The Cycle**

- 1) Fill in the table below:

What you clicked:	What happened:

- 2) Describe the gas exchange you observe between the plant and the person.
- 3) Analyze how changes in environmental factors, such as light availability and carbon dioxide concentration, impact the efficiency of photosynthesis.
- 4) Make a prediction about what would happen to the rate of photosynthesis if the shade stayed closed?

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## Part 2: Atomic Shuffle

1) Fill in the table below:

Photosynthesis ingredient	Input or output?	Input: Where does it come from? Output: Where does it go?
	input / output	
	input / output	
	input / output	
	input / output	

2) What are the structures that allow for gas exchange in leaves?

3) On the third slide, you will see a bunch of H atoms by themselves. An electron carrier called NADP<sup>+</sup> picks up some of the H atoms left by themselves and becomes NADPH. It loses its H and becomes NADP<sup>+</sup> again, releasing the energy that helps build glucose (food) molecules. Which statement about NADPH and glucose is correct? **Circle all that are correct.**

- a) NADPH is easy to make when there is plenty of water.
- b) NADPH contains more energy than glucose.
- c) NADPH contains less energy than glucose.
- d) NADPH is more difficult to manufacture than glucose.
- e) When NADPH drops its hydrogen, it can become NADPH again.
- f) When chemical bonds in NADPH or glucose are broken, energy is released.

4) Write the photosynthesis equation below. Label the **reactants** and the **products**.

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### Part 3: Three Puzzlers

**Directions:** Read each puzzle, choose an answer, and then answer the question about the puzzle.

Puzzle 1: Evaluate the importance of oxygen as a byproduct of photosynthesis in maintaining life on Earth. How does this output impact other organisms?

Puzzle 2: Diagram or describe an experiment to test how varying light intensities influence the amount of glucose produced during photosynthesis. The diagram or description should include what you would change and what output you would measure. Then, write at least one sentence predicting the outcome of the experiment.

Puzzle 3: What happens to the levels of oxygen and carbon dioxide inside the leaf during photosynthesis? You can describe what happens or create a model by drawing a graph of gas concentration over time.