Photosynthesis Simulation

Name:	

You will be examining photosynthesis in an aquatic plant using dissolved oxygen.

Go to the cell energy simulation at Biology Simulations.

I. Background

Plants perform both photosynthesis and cellular respiration.

1. How will photosynthesis affect oxygen levels?

2. How will cellular respiration affect oxygen levels?

II. Light Intensity

Experimental Question: How does light intensity affect oxygen production?

1. Write your hypothesis.

Hypothesis:	

2. Set the fish number to 0 and the plant number to 5. Leave the other variables at the default values (25 degrees, white light).
3. Set the light intensity to 100%.
4. Click Run Simulation and record the starting and ending oxygen values.
5. Repeat steps 3 and 4 for 80%, 60%, 40%, and 20%.
6. Calculate and record the DO difference.

Light Intensity (%)	DO Start	DO End	DO Difference
100			
80			
60			
40			
20			

7. Insert a graph (use Sheets or another spreadsheet program) displaying how light intensity affects changes in DO.

8. Write a sentence conclusion.

9. Write a paragraph explaining your conclusion in terms of the process of photosynthesis.

III. **Light Color**

Experimental Question: How does light color affect oxygen production?

1. Write your hypothesis.

Hypothesis:	

2. Set the fish number to 0 and the plant number to 5. Leave the other variables at the default values (100% light intensity, 25 degrees).
3. Set the light color to white (a combination of all wavelengths/colors).
4. Click Run Simulation and record the starting and ending oxygen values.
5. Repeat steps 3 and 4 for violet, blue, green, yellow, orange, and red light.
6. Calculate and record the DO difference.

Light Color	DO Start	DO End	DO Difference
White			
Violet			
Blue			
Green			
Yellow			
Orange			
Red			

7. Insert a graph (use Sheets or another spreadsheet program) displaying how light color affects changes in DO.

8. Write a sentence conclusion.

9. Write a paragraph explaining your conclusion in terms of the process of photosynthesis.

IV. Temperature

Experimental Question: How does temperature affect oxygen production?

1. Write your hypothesis.

Hypothesis:	

2. Set the fish number to 0 and the plant number to 5. Leave the other variables at the default values (100% light intensity, white light).
3. Set the temperature to 15 degrees.
4. Click Run Simulation and record the starting and ending oxygen values.
5. Repeat steps 3 and 4 for 20, 25, 30, and 35 degrees.
6. Calculate and record the DO difference.

Temperature (C)	DO Start	DO End	DO Difference
15			
20			
25			
30			
35			

7. Insert a graph (use Sheets or another spreadsheet program) displaying how temperature affects changes in DO.

8. Write a sentence conclusion.

9. Write a paragraph explaining your conclusion in terms of the process of photosynthesis.