Designing an Experiment to Test the Rate of Photosynthesis

Name: _____

Group Members: _____

Summary:
This activity allows for the measurement of the rate at which the photosynthesis process occurs. Groups will design an experiment with **one independent variable** and test this variable on **spinach** leaf disks.

The punched out leaf disks will initially sink in a test tube of water but will **float** as **photosynthesis** occurs.

Basic Materials provided by <u>TEACHER</u> for each lab group of 2-3 students:

- Spinach leaves
- Hole punch
- Syringe

- -.2 % sodium bicarbonate
  (baking soda) solution
- Test tubes

- Light source
- Thermometer
- Microscope

Assignment Outline

Procedure / Experimental Design: (REMEMBER: No pronouns)

<u>Descriptive title of experiment</u>: (1 T)
       The effect of _____ on the rate of photosynthesis.

<u>Purpose</u>: (2 T)
<u>Hypothesis</u>: *(use if/ then format)* (2 T)
         - *Explain the logic of the stated hypothesis*

<u>Procedure</u>:
- The **independent** variable (manipulated) variable in the experiment is _____ (1 T)
- The **dependent** variable (responding) in the experiment is _____ (1 T)
- How was the experiment **controlled**? (2 T)
- Is the data collected **qualitative** or **quantitative** data? Explain (2 T)
- Experimental design used. **Maximum 12 steps**.
  (It should be specific enough so that the experiment could be reproduced exactly as it was set up; include all measurements, angles, label materials / solutions used, wattage and type of light bulbs, etc.) (10 T)

<u>Observations</u>**:** (3 T)
- Data **chart**: *(you design, label and fill in with observations - you must have enough data to make a graph)*

<u>Results</u>**:**
- **Graph** of your data (5 C)
- Graphs of **2 other groups'** data (10 C)

<u>Analysis & Conclusion</u>**:**
- Summarize YOUR observations. Provide explanations (3 C)
- Summarize the trends from the 2 other graphs (4 C)
- List possible **sources of error** (2 C)

/24 T   /24 C