

# The Floating Leaf Disk Assay for Investigating Photosynthesis

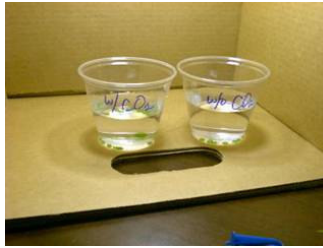
1. Use the hole-punch to cut 20 uniform disks from the leaf samples you have been given. Make sure the disks are the same size and a complete circle. Avoid major veins.



2. Infiltrate the leaf disks with sodium bicarbonate solution.
  - a. Remove the piston or plunger and place 10 leaf disks into the syringe barrel.
  - b. Replace the plunger being careful not to crush the leaf disks.
  - c. Push on the plunger until only a small volume of air and leaf disk remain in the barrel (<10%).
  - d. Pull a small volume of sodium bicarbonate solution into the syringe. Tap the syringe to suspend the leaf disks in the solution.
  - e. Holding a finger over the syringe-opening, draw back on the plunger to create a vacuum. Hold this vacuum for about 10 seconds.
  - f. While holding the vacuum, swirl the leaf disks to suspend them in the solution. Let off the vacuum. The bicarbonate solution will infiltrate the air spaces in the leaf causing the disks to sink. The bicarbonate serves as an alternate dissolved source of carbon dioxide for photosynthesis. **YOU WILL PROBABLY** have to **REPEAT** this procedure several times in order to get the disks to sink.
  - g. You may have difficulty getting the disks to sink even after applying a vacuum 3 or 4 times. Keep trying and call your teacher.



3. Pour the disks and solution into a clear plastic cup.
4. Add bicarbonate solution to a depth of 3 centimeters. Use the same depth for each trial.
5. Repeat step #2 (a-g) but use pure water instead of the bicarbonate solution.
6. Place the cups under the light source (the grow lamps) and start the timer. At the end of each minute, record the number of floating disks on the chart. Then swirl the disks to dislodge any that are stuck against the sides of the cups.

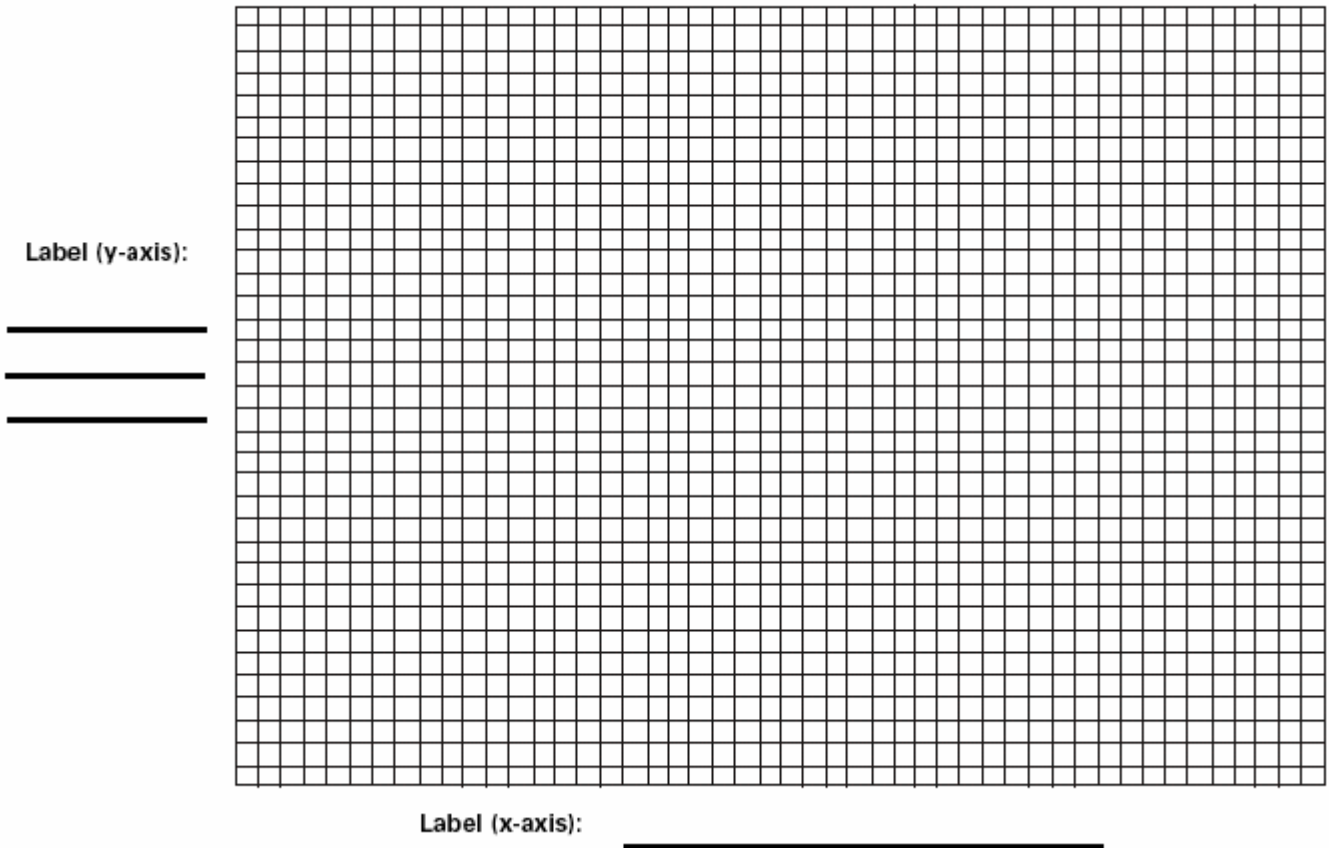


7. Continue until all the disks are floating.

### DATA SHEET

Time	dH <sub>2</sub> O Disks floating	Sodium Bicarbonate Disks Floating
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Graph 1.1 Title: \_\_\_\_\_



### QUESTIONS

1. What causes the disks to rise?
2. What is the dependent variable?
3. What is the independent variable?
4. By looking at your graph (yes, you need a graph) at what point would 50% of the disks float?
5. What purpose does sodium bicarbonate serve?
6. Relate the equation of photosynthesis to this lab.