Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Leaf Disk Photosynthesis Lab**

**Worth 15 points**

**Purpose**

The purpose of this lab activity is to determine the rate of photosynthesis.

**Materials**

1. Syringes – 2
2. Baby food jars – 2
3. Masking tape – 2
4. Water – 100 ml
5. Baking soda and water – 100 ml
6. Leaf disks – 20
7. Timer – 1

**Procedure** (Worth 3 points.)

1. Using the masking tape, label one baby food jar as water and the other baby food jar as baking soda water mix.
2. Fill your baby food jar labeled as water with 100 ml water using the provided graduated cylinder and large container labeled as water.
3. Fill your baby food jar labeled as baking soda and water with 100 ml baking soda and water mix using the provided graduated cylinder and large container labeled as baking soda and water.
4. To keep everything in both conditions (leaf disks in water and leaf disks in baking soda and water) the same, the remaining steps of the lab will need to be completed at the same time. One person in the team will need to work with the leaf disks and water and a different person will need to work with the leaf disks and baking soda and water.
   1. Remove the plunger from the syringe.
   2. Place 10 leaf disks into the syringe barrel and tap them to the bottom.
   3. Insert the plunger into the syringe to the 1 CC mark.
   4. Insert the syringe tip into the solution in the baby food jar.
   5. Extract the plunger to the 5 CC mark.
   6. Turn the syringe so the tip is up.
   7. Swirl the leaf disks to remove air bubbles from the disks.
   8. Push the plunger to remove the air from the syringe. The syringe should now be at the 4 CC mark.
   9. Cover the syringe tip with your finger/thumb.
   10. Pull the plunger back to the 10 CC mark and swirl the leaf disks for 10 seconds.
   11. Slowly push the plunger back into the barrel to release the vacuum.
   12. Check to make sure all the disks in each syringe sink.
   13. Repeat in both syringes if any disks do not sink.
   14. After all disks sink, pour the leaf disks and solution into the corresponding baby food jar.
5. Set both baby food jars under one of the light sources provided.
6. Each minute record the number of disks floating and then gently swirl each baby food jar two seconds.
7. Repeat until all leaf disks are floating.

**Results** (Worth 5 points.)

|  |  |  |
| --- | --- | --- |
| **Time in Minutes** | **Floating Leaf Disks in Baking Soda Mix** | **Floating Leaf Disks in Water** |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |
| 11 |  |  |
| 12 |  |  |
| 13 |  |  |
| 14 |  |  |

1. Which light source did you use?
2. Using the light meter and measuring in foot candles, how intense was the light where you set your baby food jars?

**Conclusion** (Worth 7 points.)

1. Explain the process that caused the leaves to rise. (1)
2. Which solution worked the best? Why? (Hints: Think of why a soda fizzes. The baking soda mixed with water has a similar effect. Feel free to look at the chemical makeup of the baking soda.) (2)
3. What was the purpose of using the water for one mixture? (1)
4. Design an experiment using the same set up to investigate a different variable in the rate of photosynthesis. Make sure that you explain ***how*** you would collect your data and ***why*** you chose this variable to test. (3)