

**PHE Duckweed experiment**  
**January 2008**

Name \_\_\_\_\_

This experiment involves observing duckweed.

Duckweed is a free floating plant that lives on still shallow waters. There are a few different types of this plant. The stem of this plant looks like a leaf and will be called a frond. The duckweed has been collected from the Martinez Mountain View Sanitation District's ponds that PHE 3<sup>rd</sup> graders will visit during MARE week.

The duckweed will be floating in a nutrient solution so it should grow. PHE students will test what happens if large quantity of soap is added to the nutrient solution over the course of a few days.

Observations should include does the color of the duckweed change and do the number of fronds (remember they look like leaves) changes at specific times during the experiment.

#### Procedure

1. Obtain the two cups.
2. Mark one for soap to be added.
3. Receive 200 mL of nutrient solution for the cups.
4. With assistance transfer four fronds of duckweed into the two cups.
5. Then a Saint Mary's College student will add the 5 mL of soap to the labeled cup.
6. Make initial observations of the two cups and place them on the shelf near the window. Draw pictures on your handout of the duckweed in your two cups.
7. Begin your observations.

#### Daily

Count the fronds in each cup. Note the color of the fronds in each cup.

Are the fronds showing some change?

Is it as expected on day 1 and day 2?

Student Observations      Name \_\_\_\_\_

The experiment begins after the duckweed has been transferred.

What is the color of the duckweed fronds after transferring them in to the nutrient solution? \_\_\_\_\_

What is the color of the nutrient solution? \_\_\_\_\_

What is the color of the nutrient solution plus the added soap? \_\_\_\_\_

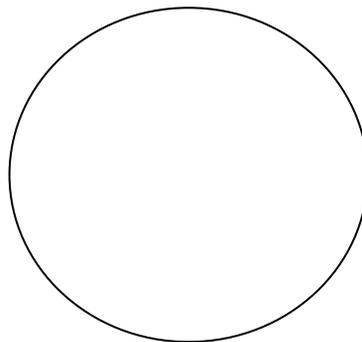
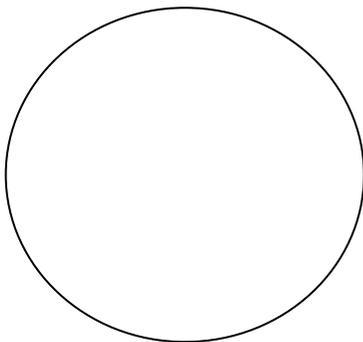
Why do we place the cups with the duckweed on the shelf near a window?  
\_\_\_\_\_

Table of observations at start of experiment

Cup number	mLs of nutrient solution	mLs of tap water	mLs of soap solution	Total volume (mL)	Color of duckweed and number of fronds
1	200	5	0		
2	200	0	5		

Draw a picture of the duckweed floating in the cups and note whether the cup has added soap or just tap water. (Use crayons or colored pencils to show the duckweed fronds)

Day 0 – At very start of the experiment



Name \_\_\_\_\_

Table of observations after one day in the classroom

Cup number	Color of duckweed and number of fronds
1 without soap	
2 with soap	

Day 1 – After the duckweed has been given time to grow and take in nutrients.

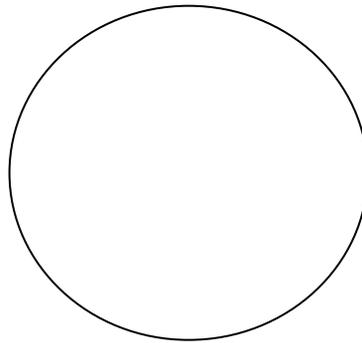
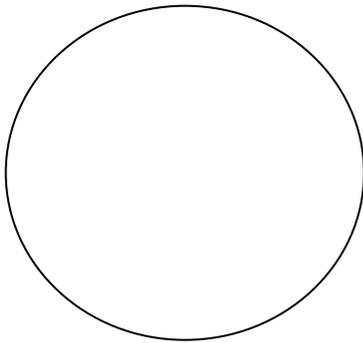
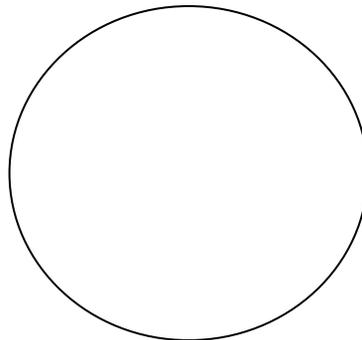
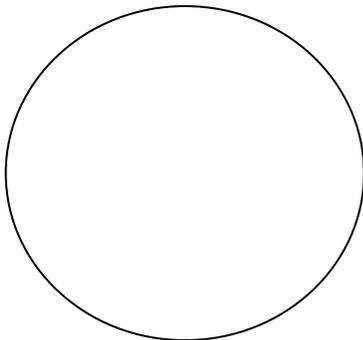


Table of observations after two days in the classroom

Cup number	Color of duckweed and number of fronds
1 without soap	
2 with soap	

Day 2 – After the duckweed has been given time to grow and take in nutrients.



Conclusions

What was observed?..... Explain in one sentence.

---

---

---

If we performing this experiment again would you expect the same behavior?? Why ?

---

---

---

---

If we tried different types of duckweed would you expect the same changes to appear??

---

---

---

Can you try to draw a bar graph of the data collected such as number of green fronds on each day (If your teacher approves do this on graph paper.)?

---

Other concluding thoughts: \_\_\_\_\_

---

---

---

Preparation for delivery to 5 classrooms with 20 3<sup>rd</sup> graders in each.

Needed items

Needed items	Number per classroom	Backups per classroom	Number in total
Cups (with a volume of least 225 mL)	50	5	275
Plastic graduate cylinders (100 mL)	2	0	10
Beakers plastic(600 mL)	1	0	5
Tweezers	2	1	15
Sharpie or Whiteboard pens	2	0	10
Handouts	25	5	150
50 ml beaker for soap	1	1	10
Plastic pipets with 1.0 ml marking	5	0	25
Plastic bottle for soap	5	0	5
2.0 Liter nutrient solution	1	0	12.0 Liters includes an extra 2.0 Liters
Soap solution	25 mL	10 mL	175 mL
Duckweed in capped jars	50 fronds	Extra 25 fronds	275 fronds (5 jars total)
Box for stuff	1	1	6
Transparencies	1 set	0	5

Cups to hold 200 mL of liquid easily