Salinity Lab

Name_____ Block_____

BACKGROUND INFORMATION

Temperature and **salinity** (the amount of dissolved salts in the water) affect the density of the water. Ocean salinity differs by small numbers, so oceanographers need to be accurate when measuring salinity. Changes in density caused by wind and currents at the surface affects the deep-ocean currents. Density ultimately affects the objects that are existing in the water, such as whales, seaweed, and submarines. The saltier the water, the more buoyant an object becomes. Therefore, salt waters are constantly trying to find their "place" in the ocean according to their salinity. Very salty water is more dense, and will sink more, thus very salty water is found at the bottom. Less salty water is less dense and will float on top of the more dense salty water.

Of course the layers are more complicated than this, but for this activity, you should be able to understand that salt or fresh water drops are going to want to "hang out" in water with similar properties. So fresh water drops will rise to the fresh water layer and salt water drops will sink to the salt water layer. The salinity of the water mixes, or changes, only when vigorously stirred. The U.S. Navy pays close attention to ocean salinity to be sure they know how submarines will travel as they move through the different waters of the world.

MATERIALS:

· 1 large clear beaker
· clear tap water·
· tap water dyed with blue food coloring
· clear very salty water
· slightly salty water dyed with red food coloring
· very salty water dyed with green food coloring
· masking tape
· 1 beaker
· stirring rod
· two medicine droppers

DIRECTIONS:

Part I

1. Fill beaker 3/4 full with clear tap water.
2. Fill medicine dropper with very salty green water.
3. Place one drop of very salty green water into the beaker with clear water.
4. Record observations: _____

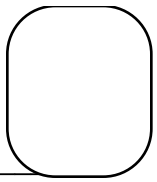
Part II

5. Fill beaker 3/4 full with clear salt water.
6. Fill the other medicine dropper with blue tap water.
7. Place one drop of blue tap water into the cup with clear salt water.
8. Record observations: _____

Part III

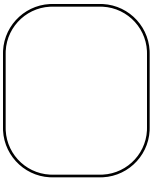
11. Fill the large beaker half full with very salty green water.
12. Pour clear tap water slowly into 1/4 of the beaker on top of very salty green water.
13. Record observations: _____
14. **Making sure that the dropper is clean**, fill the dropper with slightly salty red water.

15. Place the dropper **into** the layer of very salty green water and squeeze out a drop of slightly salty red water.



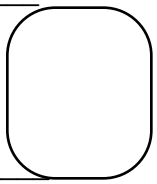
16. Record observations: _____

17. Take the same dropper of slightly salty red water and place it into the layer of clear tap water and squeeze out a drop of slightly salty red water.



18. Record observations: _____

19. Using the stirring rod, mix the layered water system together.



20. Record observations: _____

SUMMARY QUESTIONS:

1. What happened to the drop of very salty green water in the tap water? Why?

2. What happened to the drop of blue tap water in the salty water? Why?

3. Why did the tap and very salty green water not mix together?

4. What happened when the two drops of slightly salty red water were added to different layers? Why?

5. How do oceanographers measure the different densities out in the open ocean?

6. Why is this information important?
7. Who would this information be important to?
8. **Table 1** lists the approximate surface water salinities at various latitudes in the Atlantic and Pacific Oceans, Using the data construct a salinity curve for each ocean. Use different colored pencils for each ocean!

Table # 1 All measurements are in parts per million.

Latitude	Atlantic Ocean	Pacific Ocean
60ºN	33.0	31.0
50º	33.7	32.5
40º	34.8	33.2
30º	36.7	34.2
20º	36.8	34.2
10º	36.0	34.4
Oº (Equator)	35.0	34.3
10ºS	35.9	35.2
20º	36.7	35.6
30º	36.2	35.7
40º	35.3	35.0
50º	34.3	34.4
60º	33.9	34.0

9. At which latitudes are the highest surface salinities found? Suggest a reason why.

10. Of the 2 oceans, which has the higher average surface salinity? _____
Suggest a reason for the difference in average surface salinities between the oceans.