Name _____ Date _____ Period _____

Ocean Characteristics

Directions – complete the following activities to learn more about the characteristics of the water found in Earth's oceans.

Activity 1 – Density Differences in the Oceans

Purpose – To observe how cold temperature waters travelling from the poles interact with warm waters travelling from the equator.

Materials – Density Box, hot tap water, cold tap water, 2 - 600mL beakers, grease, 2 contrasting colors of food coloring.

Procedures –

1. Locate the awesome density box of science. Slide the central divider out and use a thin layer of grease to help form a seal between the 2 chambers, then slide it back in, carefully.
2. Measure 500 mL of cold tap water into the beaker and add 4 drops of food coloring.
3. Measure 500 mL of hot tap water into the beaker and add 4 drops of a food coloring. Make sure it is a different color
4. At the EXACT same time, pour hot on one side of the box and the cold water on the other side of the box.
5. Wait about 20-30 seconds to allow the water to settle.
6. Carefully, lift the divider from the chamber and observe results.

Analysis Questions

7. What color is the hot tap water?

8. What color is the cold tap water?

9. Describe what happened to the cold and hot water when the divider was removed from the container.

10. Draw a colored picture to show the results of the experiment in the box below.

11. Explain how this shows there is a difference in the density of the water.

Activity 2 – Salinity and the Oceans

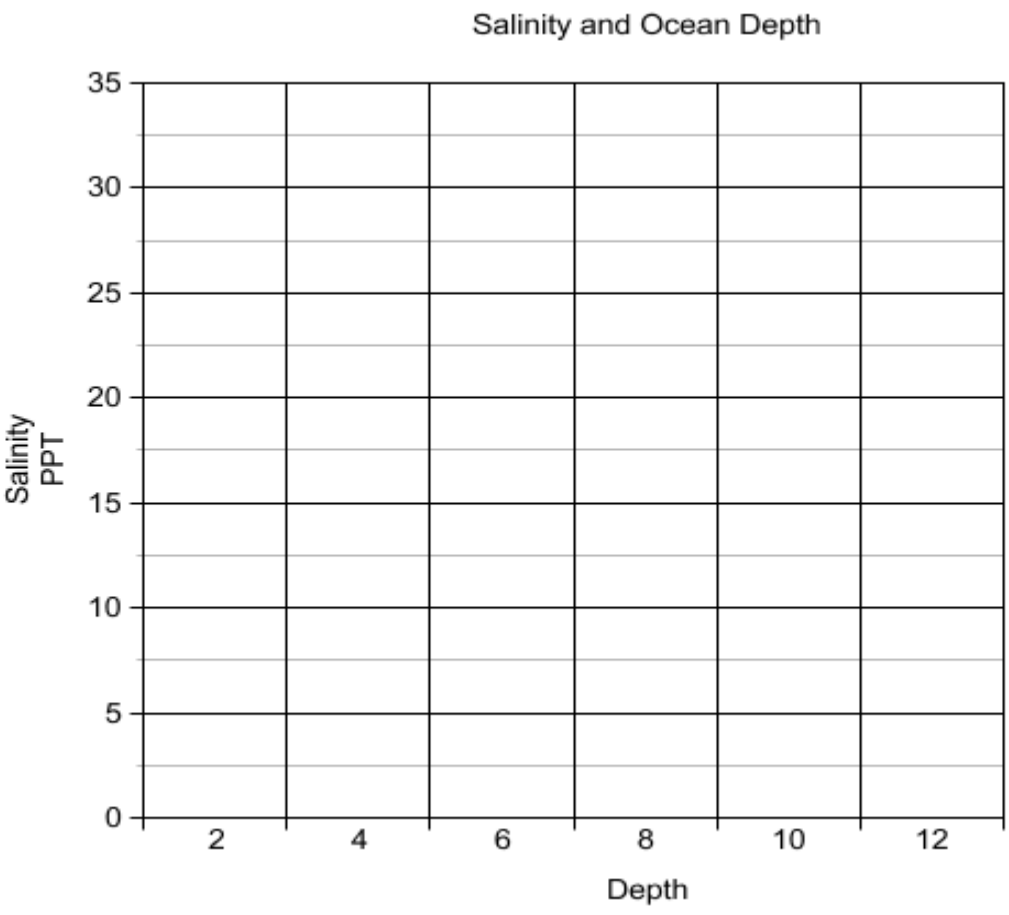
Directions – use the data tables to help answer the following questions about Earth's oceans and salinity differences.

Table 1 – Salinity and Ocean Depth

Depth/m	Salinity in Parts Per Thousand					
	Site 1	Site 2	Site 3	Site 4	Site 5	Average
2	21.2	22.0	19.8	20.3	21.4	
4	22.2	22.6	22.3	22.4	21.9	
6	23.2	23.8	22.5	23.1	22.8	
8	27.6	27.3	27.7	28.1	28.0	
10	29.3	28.7	29.1	29.2	29.4	
12	30.0	29.3	31.1	29.8	30.2	

1. Complete the data table by finding the average salinity in the empty spaces.
2. What pattern do you observe by looking at this data table that shows the change in salinity with ocean depth (how deep)?

3. Use the data table to create a **bar graph** to compare the average salinity and the ocean depth. Then use the information to help answer the analysis questions.



Analysis Questions

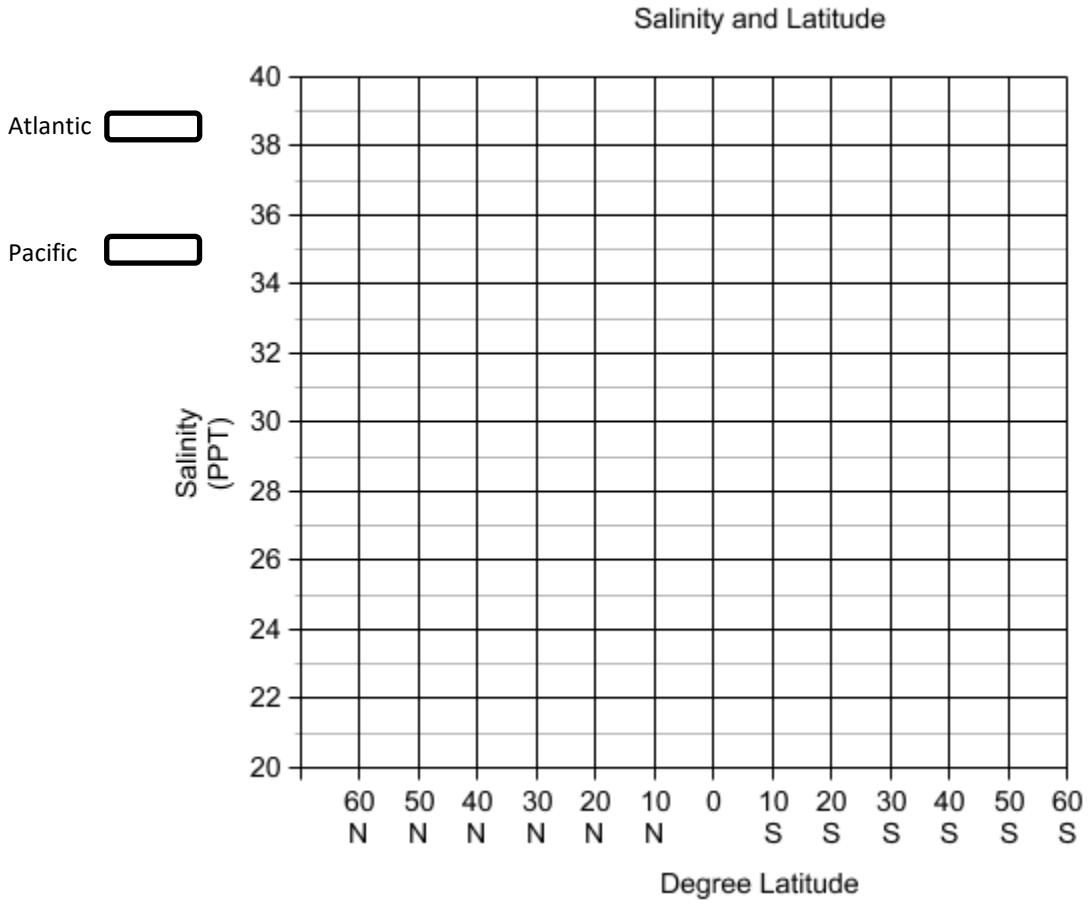
4. According to the graph, what happens to the salinity as the depth increases?

5. What do you think may be causing this change?

6. Below is a data table showing the salinity (ppt = parts per thousand) of the Pacific and Atlantic Oceans as latitude changes. Use the data table to make a **line graph**. Use a different colored pencil to show the data for each ocean. Then compare the results to help answer the analysis questions.

Table 2 - Salinity and Latitude

Latitude	Atlantic PPT	Pacific PPT
60° N	33.0	31.0
50° N	33.7	32.5
40° N	34.8	33.2
30° N	36.7	34.2
20° N	36.8	34.2
10° N	36.0	34.4
0°	35.0	34.3
10° S	35.9	35.2
20° S	36.7	35.6
30° S	36.2	35.7
40° S	35.3	35.0
50° S	34.3	34.4
60° S	33.9	34.0



Analysis Questions

7. Where is the salinity the lowest for both oceans?

8. Where is the salinity highest for both oceans?

9. Knowing that 0° is at the equator, what happens to the salinity (ppt) when moving north away from the equator?

10. Knowing that 0° is at the equator, what happens to the salinity (ppt) when moving south away from the equator?

11. Which ocean has a higher salinity?

12. Which ocean would have a have a higher density? Explain your answer.

13. What do you think would happen where the 2 oceans meet if they have different densities? Explain your answer