Name_____ per_____

Ocean Currents - Density and Movement

Due Friday 12/6

Essential Question: What causes the circulation of ocean currents?

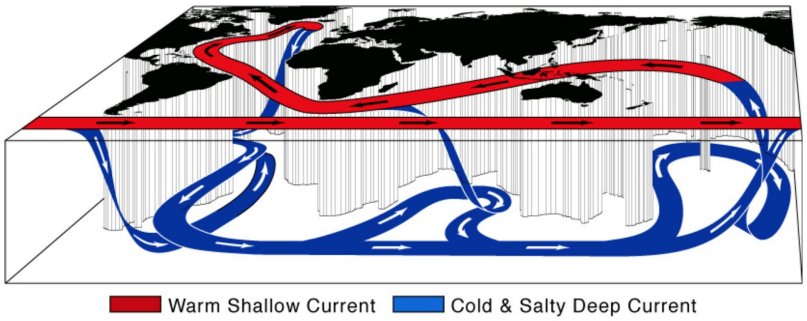
1. Use the diagram to fill in the blanks.
   a. The deep current is

      _____ and

      _____.

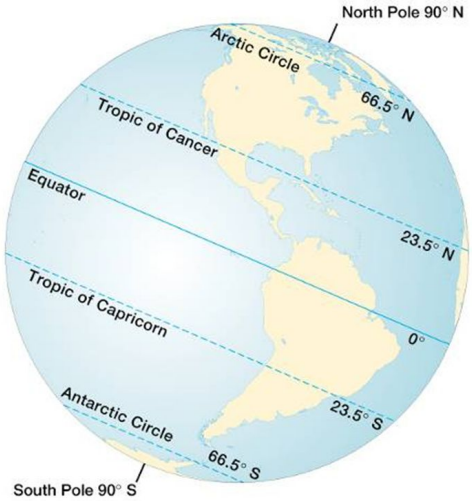
   b. The shallow current is

      _____.



   c. Prediction: Why do you think the warmer current flows above the cold and salty one?

2. <u>Energy From the Sun = Temperature</u>
   a. Label each line with the amount of energy it receives from the sun. [**HIGH** / **MEDIUM** / **LOW**]



3. <u>Density Review</u>
   a. Egg Drop Soup
      i. The density of fresh-water is (**MORE** / **LESS**) than the egg.

      ii. The density of salt-water is (**MORE** / **LESS**) than the egg.

      iii. This is a result of salt having a (**HIGHER** / **LOWER**) density than water.

      iv. Prediction: Why do you think the denser item <u>sinks</u> while the item with less density <u>floats</u>?

b. Gravity model

i. The density of the ping pong ball is (**MORE** / **LESS)** than the golf ball.

ii. The golf ball is (**MORE** / **LESS) affected by gravity** than the ping pong ball.

iii. Thinking question: What do you think gravity has to do the egg floating or not floating? Think about density here.

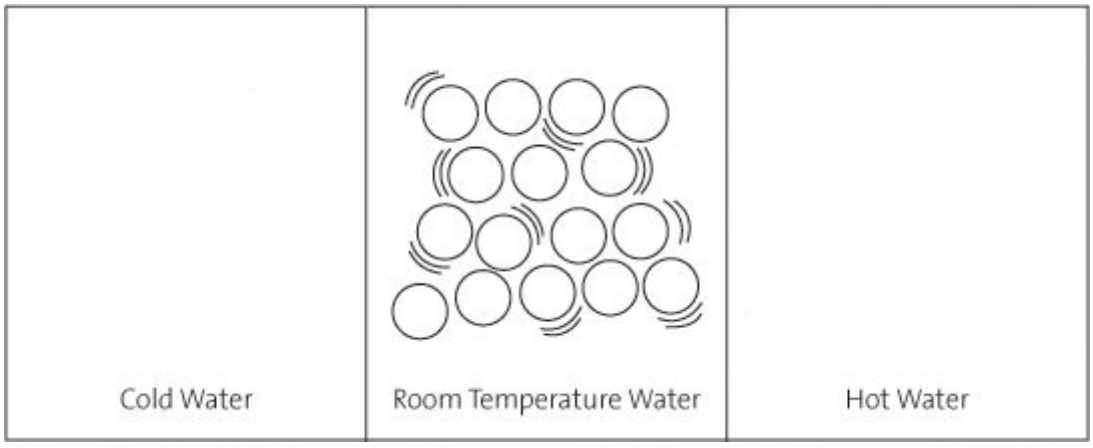
iv. If the salt water were blue and the fresh water green, which would float on the other? Explain your answer using the evidence from parts a & b.

4. Water Temperature and Density

a. Observe the teacher demonstration.

b. Describe what is happening with the hot (red) water and the blue (cold) water.

c. In the table below, draw the spacing of the molecules in the hot and cold water.

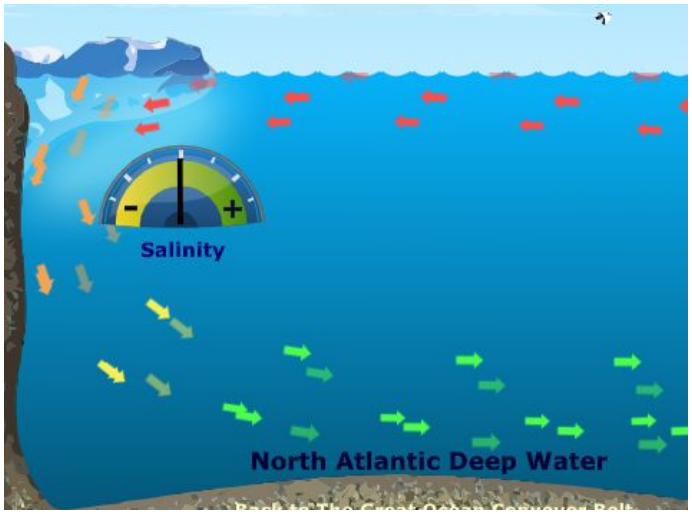


d. The density of hot water is (**MORE** / **LESS)** than the cold water.

e. Explain why the hot water stayed at the top of the bin, while the cold water sank to the bottom.

Essential Question: What causes the circulation of ocean currents?

Use information and evidence from this activity



Highly Proficient Opportunity

1. An increase in temperature causes both:
    a. more sea ice and glaciers to melt
    b. an overall increase in the temperature of the ocean
2. As air temperature increases, we also see the overall ocean circulation to slow down near the poles.
3. Using your knowledge of density and matter, explain why an increase in temperature causes ocean circulation to slow down.

The role of water in Earth's surface processes - Ocean Currents

4 Highly Proficient	**3** Proficient	**2** Close to Proficient	**1** Developing
❑ My answers are detailed. ❑ I can explain why an increase in temperature will slow ocean circulation. ❑ I use most of the concepts from this activity to explain.	❑ The tasks are complete ❑ I can show understanding of ocean currents. ❑ I use information and evidence from the lab in my answers. ❑ I am on the right track with the HP but need to add more detail.	❑ I can show some understanding of ocean currents. ❑ My answers need more detail. ❑ Some of my information may be incorrect. ❑ My work is incomplete.	❑ I show little to no understanding of ocean currents.