

Lab: Water Density

(online version)

Water density plays a critical role in ocean stratification and climate patterns on our planet. Watch the video links below to complete the questions about water density and ocean stratification.

<https://www.youtube.com/watch?v=qMsfC3QGTbo> (time 4:13)

1. What are the three freshwater sources in the Arctic?
2. In the ocean, the two main factors influencing density are _____ and _____.
3. _____ is the layering of ocean waters.
4. Two ways that ocean waters get stratified are what?
5. The densest water in the world is where?
6. Which group of oceanic organisms is most impacted by ocean stratification?

<https://www.youtube.com/watch?v=Ak9CBB1bTcc> (time 2:13)

7. When the cold blue water mixed with the warm red water, what did you observe?
8. When there was no temperature difference, what did you observe when the red and blue water mixed?
9. What type of water is needed if ships want to carry more cargo?
10. Outline the function of a plimsoll line on the side of a ship as shown on the Titanic in the video.

<https://www.youtube.com/watch?v=7fqOtgG6vik> (time 1:34)

11. When 0% salt water and 3.5% salt water meet, what did you observe? Why does this occur?
12. As the divider is added and one side is mixed, what happened to the two layers of water?
13. Once the divider was removed, describe the layers formed in terms of color and density.

<https://www.youtube.com/watch?v=bN7E6FCuMbY> (time 2:43)

14. What do you learn about the molecules associated with the cold, blue water?
15. Using your knowledge from #14, predict the position of the molecules associated with the warm red water.

<https://www.youtube.com/watch?v=p4pWafuvdrY> (time 4:33)

16. What four things drive ocean currents?
17. Surface currents control the top _____ of our oceans while deep currents control _____.
18. What controls surface currents?
19. Describe the movement of gyres in the Northern Hemisphere versus the Southern Hemisphere.
20. The rotation of Earth greatly influences the movement of water. This is referred to as what?
21. Deep ocean currents are primarily controlled by what?
22. Why is water at the North Pole so salty?
23. What is the base of ocean food chains?
24. How long does it take for a single drop of water to circle the entire planet?