Name: Date: Class Period

Ocean Currents

Ocean Currents: How they work and why they are so important

https://youtu.be/q_USR2A7Am4

Student Notes:

Planet earth has its own, built in, heating and _____ conditioning system. Three characters from the movie "Finding Nemo" will help us identify this system and where it is found. These characters were zipping along on an underwater river known as the E.A.C. or East Australian Current. It's the movement of the water in these currents and the _____ in the water of these ocean currents that is the heartbeat of earth's heating and cooling system.

Without a cooling system the _____ rays of sunlight at the equator would make it too hot to live. And without a warming system at the poles the indirect sunlight would lead it to get super _____. People and animals would be squished into a small livable zone between the _____.

In order to understand how currents can flow in the ocean you've got to understand _____. In order to get convection to happen you must have differences in _____ in a fluid. There are two main ways that density will change in ocean water. The first way is when there is change in the _____ and the second way is when there is change in the _____.

Salinity is just the amount of dissolved chemicals in a fluid and in the ocean we are mostly talking about _____. As salt is dissolved in ocean water the water becomes more _____ and sinks. As water freezes, most of the salt is left behind in the water beneath the _____.

In the fish tank ice is used to make the water near the "poles" cold, while a hot rock is used to heat up the water near the "equator". Of course there is a little bit of a problem with the model. In the real world the ocean is heated from the top by the _____.

At the poles the high salinity, cold water becomes very dense. The cold water _____ to the bottom of the ocean and moves towards the equator. Meanwhile the less dense, warm water travels from the equator towards the _____. It's a beautiful circle that warms the poles and cools the equator.

The fish tank model is a little simpler than the actual planet earth where ocean currents are deflected and must travel around the _____. Deep water formation occurs where salty and cold water _____. It gradually makes its way back to the equator where it is _____ and rises. It then travels along the surface currents which are influenced by the global _____. It can take _____

years for a drop of water to travel the path of this current which is also known as The Great Ocean Conveyor _____ or the Thermohaline Current which brings energy and matter all around our globe.

Draw it:
Make a labeled illustration (picture) that shows how you would create convection in a fish tank. Include all of the following labels. N. Pole, S. Pole, Equator, high salinity, cold water, warm water. Use arrows to show where the water would move.

Explain several ways the movement of the currents in the real world is different from the simple model shown in the fish tank.

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Watch the bonus footage at the end of the video. What happened in the mini-experiment with the salt water in the cup, and how does this relate to ocean currents?

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Extension:
Do a word study on the word "thermohaline". Look up what the two parts of the word mean and where they come from (what languages etc.) Write what you discover below.

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