

SCIENCE A NTI DAY 7

Name _____ Class period _____

Use the reading passage to answer the questions that follow.

Water is Everything



Water is vital for our existence. Not only do we drink it for survival, the majority of the human body is also composed of water. The earth's weather patterns are closely linked to water too, as they are determined by the complex patterns of changes and movement of water in the atmosphere. Since the ocean covers 70% of the earth's surface, it plays a major role determining what happens in the environment. One of its most important roles is distributing the heat around the world; it soaks up energy in the form of heat, and releases it more evenly across the earth.

Water and Temperature

Since the ocean is so effective at absorbing heat, the first few meters of the ocean's surface hold as much heat as the earth's entire atmosphere. But how does water control the earth's weather? First, it's important to know that the temperature of the water in the ocean and its salt content affect the water's density. So, the saltier or the colder the water, the denser it is. Denser water sinks to the bottom of the ocean, while less dense water floats at the surface. The temperature of water is closely related to ocean currents, since the former affects the latter.

Ocean Currents

Simply put, ice triggers the movement of ocean currents. As water freezes in the North and South Poles, the water surrounding the ice becomes saltier and colder, since the salt leaves the water upon freezing. The ice then cools the water surrounding it. The cold, salty water then sinks due to its increased density. Once it gets to the bottom of the ocean floor, it has to move somewhere, so it travels horizontally to spread out over the surface of the earth. This is cold current. Warm water replaces it on the surface and moves to the North. This motion is called the global conveyor belt. The global conveyor belt is a global-wide current that circulates cold and warm water around the earth. So, the warm water that replaces the cold on the surface travels northward, increasing the temperature of the Atlantic Ocean. That's why countries that border the Atlantic Ocean are relatively warmer than landlocked countries during the wintertime.

However, the cold water doesn't always stay at the bottom of the ocean. Instead, it comes up at different places around the globe called upwelling. Since the ocean floor contains many nutrients important for survival, the cold water that rises to the surface brings these nutrients with it, attracting all forms of life. Usually every level of the food chain is present at these upwellings, making them great spots for fishing. In fact, upwellings are common in areas where winds blow water away from the surface. In coastal areas, sometimes winds (called longshore

winds) blow perpendicular to the land over the ocean, pushing the warm water away from the coast. This allows the cold water at the bottom to rise up and replace the warmer water. Therefore, some coastal areas are

Global Warming

Scientific evidence has shown that the earth has warmed since 1880. Global warming is caused mainly by an increase in carbon dioxide levels in the atmosphere. The increased temperatures have caused many of the ice caps in the North and South Poles to melt, disrupting the global conveyor belt. Even though the phenomenon is called “global warming,” it is more accurately described as climate change—if the ice caps melt, there will be less dense water to move around the globe. And if there’s less dense (and therefore cold) water to circulate around the earth, the Gulf Stream will be slowed down. This will result in a cooling of the Caribbean and Western Europe. Thus, global warming can in fact result in colder temperatures in some areas.

1. **Use the reading passage to select the best answer choice that supports the statement, “Water is vital for our existence.”**
 - A. Climate is indirectly affected by wind as well.
 - B. Cold water doesn’t always stay at the bottom of the ocean.
 - C. Global warming can in fact result in colder temperatures in some areas.
 - D. Water plays a major role determining what happens in the environment.

2. **When ice freezes, the water around it becomes saltier and colder. Therefore, its density _____.**
 - A. decreases
 - B. stays the same
 - C. increases
 - D. disappears

3. **The temperature of water is closely associated with _____.**
 - A. ocean currents
 - B. weather
 - C. tides
 - D. wind

4. **Great spots for fishing, _____ bring up every level of the food chain.**
 - A. tidal waves
 - B. typhoons
 - C. upwellings
 - D. water spouts

5. **TRUE OR FALSE? Global warming will result in warmer temperatures. _____**

