

Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

## Integrated Science A NTI Day

### 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 and Climate

The effect that ocean currents have on the earth's climate is still being studied by scientists around the world, but we know a few things for sure. The ocean plays a huge role in redistributing heat around the globe, like we previously explained. However, there are certain ocean currents, like the Gulf Stream (which is part of the global conveyor belt) that have a direct effect on the climates of countries they pass. The Gulf Stream travels past the Caribbean and Florida, carrying warm water, then turns off to the right toward Europe—specifically England and Ireland. That's why the northeastern part of the United States and Canada has a cooler climate; the Gulf Stream doesn't bring warm water to its shores, causing colder temperatures. And since the direction of currents is always affected by wind direction, climate is indirectly affected by wind as well.

#### 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.

**Directions: Complete these questions after reading the passages about water.**

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. Global warming can in fact result in colder temperatures in some areas.
  - C. 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
  
3. **Global warming can be caused by an increase in what gas?**
  - A. Carbon monoxide
  - B. Carbon dioxide
  - C. Hydrogen peroxide
  
4. **Global warming is also called**
  - A. upwelling
  - B. climate change
  - C. condensation
  - D. coastal sinking

**FILL IN THE BLANKS**

5. The earth has warmed since this year \_\_\_\_\_.
6. The oceans cover \_\_\_\_\_percent of Earth's surface.
7. Which ocean current is part of the global conveyor belt. \_\_\_\_\_
8. Denser water \_\_\_\_\_to the bottom of the ocean while less dense water \_\_\_\_\_ on the surface.
9. The direction of ocean currents is always affected by \_\_\_\_\_
10. Global warming can result in what kind of temperatures in some areas? \_\_\_\_\_

