NAME: _____

Before You Read

Climate Change and Salt Water

1. (Circle) the word **TRUE** if the statement is TRUE **or** (Circle) the word **FALSE** if it is FALSE.

a) The greenhouse effect traps heat in Earth's atmosphere.
TRUE **FALSE**

b) Carbon dioxide is a greenhouse gas.
TRUE **FALSE**

c) Natural gas is a fossil fuel.
TRUE **FALSE**

d) When Earth gets warmer, the ocean level drops.
TRUE **FALSE**

e) Scientists can predict what the ocean level will be in the year 2100.
TRUE **FALSE**

f) Most of Earth's fresh water is frozen in the polar ice caps.
TRUE **FALSE**

g) Rising temperature will cause most salt lakes to get deeper.
TRUE **FALSE**

h) Using gasoline as a fuel releases greenhouse gases.
TRUE **FALSE**

2. Put a check mark (✓) next to the answer that is most correct.

a) All of these are fossil fuels, *except*

- ○ **A** oil
- ○ **B** coal
- ○ **C** natural gas
- ○ **D** hydrogen gas

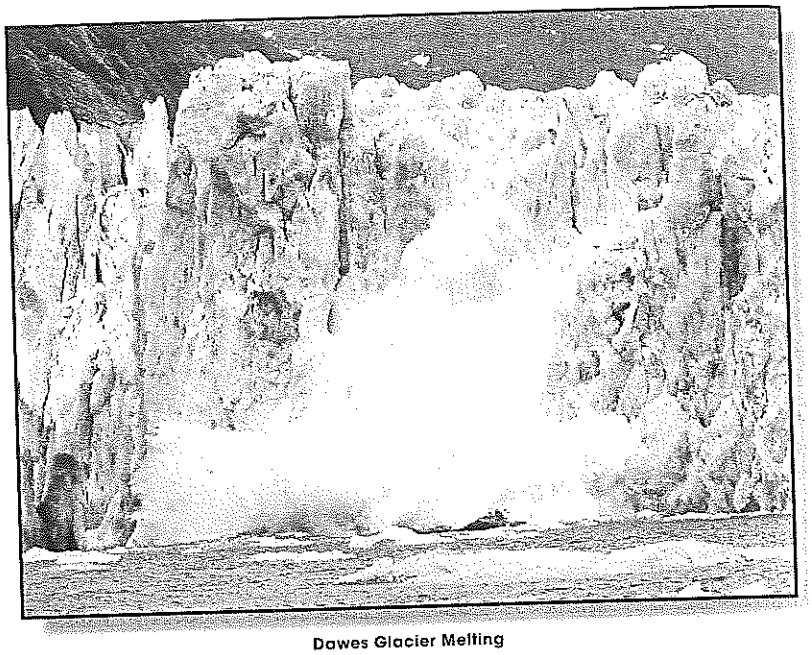
b) Where is most of Earth's salt water?

- ○ **A** in lakes
- ○ **B** underground
- ○ **C** in the oceans
- ○ **D** in polar ice caps

NAME: _____

Climate Change and Salt Water

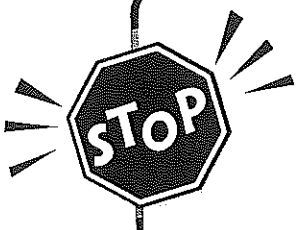
Twenty thousand years ago, The level of the ocean was 120 meters (400 feet) lower than it is today! Sea level depends on global climate, and Earth's climate is changing. One of the most important factors affecting climate is the **greenhouse effect**.



Dawes Glacier Melting

A greenhouse effect occurs wherever there is a layer of material that transmits light more readily than it transmits heat. In a greenhouse where plants are grown, the layer is glass. Sunlight passes through the glass, which warms the inside. Much of the heat produced is trapped because it cannot pass out through the glass.

For Earth the layer that **transmits** light and traps heat is a layer of gases in the atmosphere. These gases are called **greenhouse gases.** One of the most important greenhouse gases is **carbon dioxide** which is released whenever we burn **fossil fuels**, such as **coal**, **oil**, and **natural gas**. Because people have been burning a lot more fossil fuels over the past 100 years, the greenhouse effect has gotten stronger, more heat has been trapped, and Earth has gotten warmer.



Identify *three* fuels that release carbon dioxide when they are burned.

_____

_____

NAME: _____

Reading Passage

Climate Change and Salt Water

Temperature increase is the part of climate change responsible for rising sea levels. The Earth's average temperature increased by almost one degree Celsius (34 degrees Fahrenheit) during the 100 years ending in 2005. As temperature rises, more and more of the ice and snow at the North and South Poles melts and runs into the ocean, causing sea level to rise.

Over the past 3,000 years, sea level rose an average of only 0.15 millimeters (mm) per year as Earth gradually warmed from its last ice age. A distance of 0.15 mm is only about the thickness of a sheet of paper, but it does add up. During the last century, the average sea level rise was 1.5 mm per year, which is ten times the rate of earlier centuries. From 1870 to 2005, sea level rose 195 mm (7.7 in.).

It is hard to predict sea level rise over a long period of time. Many factors help determine sea level, such as tectonic plate movement, thermal expansion, and water absorption by land. Scientists have tried to estimate what sea level will be in the year 2100, and the results vary quite a bit. The average prediction is a rise of several feet. This is not so important in places like the United States, where only a small amount of the total land would become flooded. It would be a *big* problem on the low-lying islands in the tropics where whole countries are only a few feet above sea level.

Global warming will have the opposite effect on the level of most inland salt lakes. Higher temperature will not add to the water coming in because very few of these lakes are fed by melting snow and ice. Warming will increase the rate at which water is lost from salt lakes because the rate of evaporation increases with temperature. Increased water loss will cause the levels of salt lakes to drop.

Climate change will also change the pattern of ocean currents. This will change the way heat is moved around the globe. The result will be different patterns of wind and rainfall in many places on land. Fish populations will also move to new locations to find the water conditions in which they survive best.

To sum it up: Climate change, including rising temperature, is definitely happening. This will cause a rise in ocean level, a drop in the levels of most salt lakes, and changes in ocean currents. What is not known is how great these changes will be.

After You Read

NAME: _____

Climate Change and Salt Water

1. Put a check mark (✓) next to the answer that is most correct.

a) As temperature rises, the level of inland salt lakes can drop because of increased

- ○ **A** condensation
- ○ **B** evaporation
- ○ **C** precipitation
- ○ **D** runoff

b) Which of these is a greenhouse gas?

- ○ **A** oxygen
- ○ **B** nitrogen
- ○ **C** hydrogen
- ○ **D** carbon dioxide

c) About how much has ocean level changed in the last 100 years?

- ○ **A** dropped 195 millimeters (7.7 inches)
- ○ **B** dropped 1.5 millimeters (.06 inches)
- ○ **C** rose 1.5 millimeters (.06 inches)
- ○ **D** rose 195 millimeters (7.7 inches)

2. Earth's climate is changing and will probably continue to change for several decades Show how climate change will affect each characteristic of Earth by writing "Increase "Decrease" in the blank spaces after each characteristic.

a) Average temperature _____

b) Sea level _____

c) Amount of ice at the North and South Poles _____

d) Level of inland salt lakes _____

e) Amount of liquid salt water _____

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Climate Change and Salt Water

3. Answer the questions in complete sentences.

a) Explain Earth's greenhouse effect in terms of how easily sunlight and heat pass through the atmosphere.

_____

_____

b) Describe the type of countries that will have the biggest problems due to global warming and explain why.

_____

_____

Extensions & Applications

a) If sea level continues to rise at a rate of 1.5 millimeters per year, how many inches higher will sea level be 100 years from now?

_____

b) Twenty Thousand years ago, Earth's average temperature was much colder than it is today. Describe *two* ways in which Earth's surface was different 20,000 years ago, compared to today.

_____

_____

_____

_____