Honors Physical Science 2018 Name:

Energy Transfer in Earth’s Atmosphere and Oceans Period:

Read Chapter 11.1-2, 12.1-2 & 15.2-3 (Geo book)

*Ch. 11.1*

1. Why would snowfall decrease the percentage of solar radiation absorbed by the Earth’s surface?

2. Why are cloudy days generally cooler than clear days?

3. Why does the conduction of heat in the atmosphere only occur close to the earth’s surface?

4. Describe the airflow when the sun warms the land next to cooler lake or ocean surface.

*Ch. 11.2*

5. Describe heat flow and relate this to the atmosphere.

6. Describe the relationships between temperature, density, and air pressure in the atmosphere.

7. How does the atmosphere work much like an air-conditioned building? What causes wind?

*Ch. 12.1*

8. What happens to the area illuminated by sunlight as the rays strike the ground at a lower angle?

9. What happens to the relative intensity of the sunlight as it strikes at a lower angle?

10. Give the type of air mass (Continental tropical, maritime tropical, continental polar, maritime polar, arctic) associated with each set of conditions.

Warm and dry Cold and humid

Very cold and dry Warm and humid

Cold and dry

11. What type of air mass brings very cold winter air to Nebraska?

12. What type of air mass brings warm humid air from the Gulf of Mexico in the summer?

13. Thunderstorms occur when a warm humid air mass is forced over a cold dry air mass. Where would each type of air mass probably come from in the Midwest US?

*Ch. 12.2*

14. What is the Coriolis effect? Would the wind’s path be curved or a straight line if we could observe it from space?

15. Describe Hadley cells.

16. What is the intertropical convergence zone? (ITCZ)

17. Describe the four fronts from the text and the weather associated with each.

*Ch. 15.2*

18. Explain how water temperature and amount of dissolved salt affects water density.

*Ch. 15.3*

19. Discuss the horizontal movement of energy within the oceans. (gyres, surface currents, density currents)

20. Discuss the vertical movement of energy within the oceans. (upwelling, water masses)

21. One of the predicted effects of global warming is a smaller temperature and salt content difference between the southern and northern ends of the Gulf Stream that runs from the Gulf of Mexico to Northern Canada. So that the warm, saline surface waters of the Gulf Stream can continue to push northwards, there must be a comparable, deep return current of cold, dense water from the Nordic seas.

a. What happens to the rate of circulation of the current as the density difference becomes smaller?

b. What happens to the average temperature of northern Europe if the Gulf Stream current slows down?

Summarize the following Unit 2 Objectives: Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per \_\_\_\_\_

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| 1. Differentiate between kinetic and potential energies and describe the ways that energy can be stored. |
| 2. Examine the conservation and transformation of energy within systems. |
| 3. Compare and contrast the relationships between temperature, thermal energy, and heat. |
| 4. Describe how thermal energy is transferred by conduction, convection and radiation. |

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| 5. Identify internal and external sources of heat energy in Earth’s systems. |
| 6. Explain how ocean water circulation affects energy distribution in the earth’s systems. |
| 7. Apply how differential heating of the earth’s surface & atmosphere drives convection within earth’s system. |
| 8. Summarize how heat energy transfer relates to the formation of winds & air masses. |
| 9. Explain and analyze how air mass types affect weather and fronts. |