Earth Science Name

Introduction to Energy in the Earth System

Directions: Use your class notes, print and online resources to answer these important questions about energy flowing through the Earth System.

1. What is "energy"?

2. What is **radiant energy**?

3. Name five types of radiant energy. What makes them different?

4. Radiant energy can be **transferred** in three basic ways—explain each term and give one or two examples of how these occur in the Earth System:

   A. **transmission**

   B. **conduction**

   C. **convection**

5. Several processes can occur when radiant energy is transmitted. Explain each of these terms and give examples of how they apply in the Earth System:

   a. **reflection**

   b. **refraction**

   c. **absorption**

   d. **opaque**

   e. **transparent**

   f. **translucent**

6. What is **chemical bond energy**?

7. How does the Sun produce its energy?

8. By what process is radiant energy converted into chemical bond energy in plants? What the plants have that allows this to occur?

9. Trace the path of energy from the Sun to a plant to you to the atmosphere, using appropriate terms.

10. Trace the path of energy from the Sun to the ocean to form a cloud, then the energy as rain falls to the surface.

11. What is **sound energy**?

12. Explain the steps by which you are able to hear sounds.

13. What is **seismic energy**?

14. Describe three types of seismic waves measured by **seismologists**. Which causes most damage?

15. What is the difference between **kinetic energy** and **potential energy**? Give examples of each in your everyday life and also in the Earth System.

16. When water or other substances change their **state** or **phase of matter**, they absorb or release **latent energy**. Explain what this term means.

    a. How much latent energy is absorbed or released when 1 g of ice **melts** into liquid water or 1 g of liquid water **freezes** into ice?

    b. How much latent energy is absorbed or released when 1 g of liquid water **evaporates** into water vapor or 1 g of water vapor condenses into liquid water?

    c. What are **sublimation** and **deposition** in the context of phase changes? Give some examples in the world around you.

17. What is **radioactive energy?** Explain how it can be created.

18. Where does radioactive energy occur in the Earth System? What are two materials produced?

19. Satellites can detect different wavelengths of energy to monitor weather systems. Briefly explain the differences among ‘visible,’ ‘infrared,’ and ‘water vapor’ images.

20. Radar is commonly used by both police to measure speed and meteorologists to detect weather systems. Briefly explain how a radar system works.