Name: Date: Period:

Practice: Energy and Heat Transfer

1. The total of the potential and kinetic energies is called the mechanical energy. The potential and kinetic energies in a reaction are shown below:

|  |  |
| --- | --- |
| **Energy** | **Value (in kJ)** |
| PEinitial | 100 |
| KEinitial | 76 |
| PEfinal | 55 |

Based on the following reaction, what is the value of KEfinal?

PEinitial + KEinitial 🡪 PEfinal + KEfinal

1. At the top of a mountain, a skier has a potential energy of 100 kJ. When the skier is halfway down the mountain, he has a kinetic energy of 50 kJ. What is the potential energy at this point?
2. A 100g serving of Takis has 65 kJ of energy. The digestion of the Takis results in 35 kJ of potential energy and an unknown amount of heat. How much heat (in kJ) was generated during digestion?
3. Many old clocks have a swinging pendulum. At the top of the arc, the pendulum has a potential energy of 75 kJ and a kinetic energy of 0 kJ. At the bottom of the swing, the pendulum has a kinetic energy of 73 kJ and a potential energy of 1 kJ. What do you think happened to the remaining 1 kJ of energy? Explain your answer.

*Directions: In each of the following situations, identify the method of heat transfer taking place (conduction, convection, radiation).*

1. When hot coffee is stirred with a spoon, the spoon gets hot due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. A certain type of decorative lamp contains colored liquids. These liquids form globs that break and rise to the top of the liquid. The globs rise due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. The air in a room is warmer towards the ceiling. The warm air rise because of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. A high school student holds his hands above the fire to feel warm. Heat is transferred to his hand by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. A heater is placed under one corner of a water bed. Warm water moves throughout the mattress due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. A certain type of stainless steel pan has a layer of copper applied to the bottom. The copper transfers heat to the pan by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. Warm air rises while cooler air from the ocean rushes in. This is due to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
8. A huge rock at the park gets warm during the day from the sun’s rays. This is due to

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. At the same park, it gets very cold at night. You lay on the rock at night so that you can keep warm. Heat is transferred to you from the rock by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Draw your own example for each of the three types of heat transfer below. Label your drawings.

Conduction Convection Radiation

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_