Name: Key Date: _____

Mechanisms of Energy Transfer

Thermal energy transfer can happen between two objects that are in contact with each other, by the flow of material from one place to another, and through electromagnetic waves.

Identify which types of energy transfer are occurring in each of the scenarios below, and predict what will happen in each case. Remember that more than one form of energy transfer can occur in a given situation.

1. Scenario: You place a spoonful of frozen ice cream on your tongue.

   (a) Type(s) of energy transfer:
   conduction convection

   (b) Where will each form of transfer occur?
   on tongue + roof of mouth breathing

   (c) What will happen and why?
   tongue gets colder ice cream melts
   ice cream headache brain freeze

2. Scenario: You place a mug of hot tea on the table in a cool room.

   (a) Type(s) of energy transfer:
   ① conduction ② radiation ③ convection

   (b) Where will each form of transfer occur?
   ① contact with the table
   ② all hot things radiate thermal energy
   ③ - hot cup warms air and creates upward convection
   - as outer tea cools close to the cooling mug, the tea sinks and creates a convection current in the tea

   (c) What will happen and why?
   The tea will cool and the air and the table will get a little warmer.

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Mechanisms of Energy Transfer *(continued)*

3. Scenario: You place a cold metal sphere in a container of hot water.

(a) Type(s) of energy transfer:

the spoon will heat up through conduction

(b) Where will each form of transfer occur?

through the spoon.

(c) What will happen and why?

the hot water will cool down and the heat energy will go to heating the spoon

4. Scenario: You place a piece of hot rock into a metal container, and then remove all the air from the container.

(a) Type(s) of energy transfer:

① radiation, ② conduction

(b) Where will each form of transfer occur?

① the hot rock will radiate heat to the metal container

② The contact between the rock and metal will allow direct conduction

(c) What will happen and why?

① The rock will cool down and the heat will travel to the container and eventually to the air and surface the container is on.