Heat Transfer

Question 1 .

What causes liquid water to freeze?

- **A.** when heat from the water is transferred to something else
- **B.** when heat from something else is transferred to the water
- **C.** when cold from the water is transferred to something else
- **D.** when cold from something else is transferred to the water

Question 2 .

On a summer afternoon, the sand on the beach can get very hot. When you step on the sand in bare feet, you can burn yourself.

Which of the following sentences best describes how this happens?

- **A.** Heat from the Sun is transferred to the sand by direct contact. This heat is then transferred to your feet without direct contact.
- **B.** Heat from the Sun is transferred to the sand without direct contact. This heat is then transferred to your feet without direct contact.
- **C.** Heat from the Sun is transferred to the sand by direct contact. This heat is then transferred to your feet by direct contact.
- **D.** Heat from the Sun is transferred to the sand without direct contact. This heat is then transferred to your feet by direct contact.

Question 3 .

Jasmine has toast for breakfast every day. As soon as the toast pops out of the toaster, she puts butter on it. If she does it quickly, she can spread the butter over the toast with her knife, and it melts into the toast.

Why does the butter melt?

- **A.** because heat from the hot toast moves into the cool butter
- **B.** because heat from the hot knife moves into the cool butter
- **C.** because heat from Jasmine's hand moves into the cool butter
- **D.** because the pressure of her knife softens the butter

Question 4 .

Jeremy's soup is too hot to eat. He gets a cold spoon and stirs the soup.

What change in energy happens to the soup and the spoon?

- **A.** The soup and spoon both gain heat.
- **B.** The soup loses heat and the spoon gains heat.
- **C.** The soup gains heat and the spoon loses heat.
- **D.** The soup and spoon both lose heat.

Question 5 .

Josiah is going to have a cup of hot cocoa. If he wants the cocoa to stay warm as long as possible, which type of cup should he put his hot cocoa in?

- **A.** a glass cup
- **B.** an aluminum cup
- **C.** an iron cup
- **D.** a foam cup

Question 6 .

Mr. Polifka does a demonstration in science class. He holds an unlit match six inches above a candle flame. After a while, the match bursts into flame.

What most likely caused the match to catch fire?

- **A.** Matches are flammable—they catch fire when exposed to air.
- **B.** A spark from the flame leapt up to the match and caught it on fire.
- **C.** The match absorbed heat from the air until it was hotter than its environment.
- **D.** Heat from the candle flame was transferred to the match.

Question 7 .

Lewis has some play dough. He puts a thermometer in the play dough and then holds the dough in his hand, being careful not to touch the thermometer

If heat flows from his hands to the play dough, what will happen to the thermometer reading?

- **A.** The temperature will go up.
- **B.** The temperature will go down.
- **C.** The temperature will not change.
- **D.** The temperature will go up first and then down.

Question 8 .

Directions: Select the correct entry in the table.

Frying pans are good conductors of heat. A scientist developed four new materials to be used for making frying pans. He made rods of equal mass and length from each material. He tested their heat conductivity by exposing one end of each rod to the same amount of heat over the same duration of time. He measured the temperature change at the other end of the rod. The data he collected is shown in the table below.

Based on the data collected, select the name of the substance that would make the best frying pan.

	Original Temperature	Final Temperature
Material A	20°C	27°C
Material B	20°C	37°C
Material C	20°C	21°C
Material D	20°C	35°C

Question 9 .

A cook places a pan of food on a hot stove and leaves it there. When the food is just about done cooking, which of the following will most likely be true?

- **A.** The pan will be the same temperature as the stove.
- **B.** The pan will not have changed in temperature.
- **C.** The pan will be cooler than the stove.
- **D.** The pan will be hotter than the stove.

Question 10 .

Tony wants to figure out which materials conduct heat better than others. To do this, he fills cups that are made out of different materials with equal amounts of ice water. He then keeps track of how much time it takes the ice to completely melt in each cup. His results are below.

Time for Ice to Melt

Cup Material	Time to Melt
plastic	32 minutes
glass	21 minutes
aluminum	15 minutes
foam	38 minutes

Which material was the best conductor of heat?

- **A.** plastic
- **B.** foam
- **C.** glass
- **D.** aluminum