

Name: _____ Date: _____

Your Thermal Energy Quest: Mastering the Great Heat Flow

Visualize energy movement across systems to predict how molecules react during thermal shifts and phase transitions.

1. A deep-sea diver notices that their thick neoprene suit keeps them warm because it prevents heat from moving directly through the solid fabric to the cold water. This specific method of heat transfer is called:

- A. Radiation
- B. Conduction
- C. Convection
- D. Evaporation

2. When a blacksmith cools a glowing iron horseshoe in a bucket of water, the energy travels from the ___ object to the ___ object until they reach thermal equilibrium.

- A. Colder / Warmer
- B. Smaller / Larger
- C. Warmer / Colder
- D. Liquid / Solid

3. True or False: If you hold your hand near a hot lightbulb without touching it, the 'waves' of heat you feel are an example of radiation.

- A. True
- B. False

4. In a hot air balloon, the air inside is heated, causing it to become less dense and rise. This circular movement of a fluid (gas or liquid) is known as:

- A. Molecular friction
- B. Radiation
- C. Thermal expansion
- D. Convection

5. True or False: The First Law of Thermodynamics states that energy can be created if a machine is efficient enough.

- A. True
- B. False

6. Imagine a 'perfect' crystal at the theoretical temperature of ____, where all molecular motion completely stops and entropy is at its minimum.

- A. Freezing point
- B. Boltzman's Point

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- C. Absolute Zero
- D. Latent Heat

7. If you stir a cup of hot cocoa with a silver spoon and a wooden spoon, the silver spoon becomes hot much faster. This is because silver is a better ___ than wood.

- A. Thermal Insulator
- B. Convection Current
- C. Radiator
- D. Thermal Conductor

8. True or False: Adding thermal energy to a substance always causes its temperature to increase, even during a phase change like melting.

- A. True
- B. False

9. A steam engine takes in heat to move a piston. Not all the heat is turned into movement; some is 'lost' to the air as waste heat. This increase in disorder is called ___.

- A. Entropy
- B. Enthalpy
- C. Inertia
- D. Compression

10. Which of these scenarios best demonstrates the Second Law of Thermodynamics in a kitchen?

- A. An oven stays hot even after it is turned off.
- B. An ice cube tray freezes in the freezer because work is used to move heat out.
- C. A cup of hot tea sitting on a counter eventually cools down to room temperature.
- D. A microwave uses radiation to vibrate water molecules.