

Heat

Section Quiz: Temperature and Thermal Equilibrium

Write the letter of the correct answer in the space provided.

- _____ 1. Which of the following is proportional to the average kinetic energy of particles in matter?
- heat
 - temperature
 - thermal equilibrium
 - internal energy
- _____ 2. What is the energy due to both the random motions of a substance's particles and the potential energy due to the bonds between those particles called?
- vibrational energy
 - rotational energy
 - translational energy
 - internal energy
- _____ 3. What is the type of kinetic energy associated with a molecule spinning about its center of mass called? (Look in book. Ch. 9)
- vibrational energy
 - rotational energy
 - translational energy
 - internal energy
- _____ 4. Which of the following statements best describes a state of thermal equilibrium between two systems?
- Both systems have the same mass.
 - Both systems have the same volume.
 - Both systems have the same temperature.
 - Both systems contain the same amount of internal energy.
- _____ 5. Which of the following statements correctly describes what occurs to a substance that undergoes thermal expansion?
- As the temperature increases, the volume of the substance increases.
 - As the temperature increases, the volume of the substance decreases.
 - As the temperature increases, the density of the substance increases.
 - As the temperature increases, the mass of the substance decreases.

Heat *continued*

- _____ 6. The temperature of the air is measured as 235 K. What is this temperature equal to in degrees Celsius?
- a. 508°C
 - b. 203°C
 - c. -38°C
 - d. -68°C
- _____ 7. How are the Celsius and Kelvin temperature scales similar?
- a. Both scales are based on the freezing and boiling points of water.
 - b. Both scales are based on absolute zero.
 - c. Neither scale has negative temperature values.
 - d. The difference of one degree is the same for both scales.
- _____ 8. Which temperature scale is used widely in science, and is applied to non-scientific uses throughout most of the world?
- a. Celsius
 - b. Rankine
 - c. Fahrenheit
 - d. Kelvin

9. Explain how the kinetic energy of molecules in water accounts for its temperature.

10. The temperature on a warm day is 309.7 K. Calculate the equivalent to this temperature on the Fahrenheit temperature scale.