

**\*\*The study guides are intended to be a tool to guide the direction of study, and narrow the focus, but are not intended to be memorized or taken as the only possible questions about the related material.**

## **Chapter 12 Lessons 1 study guide**

### **Heat,** **Answers**

1. What is Thermal Energy?

The energy of the moving particles of matter. Particles are moving constantly!

2. What is heat?

The flow of thermal energy from one object to another. It always moves from the warmer object to the cooler one

3. What is temperature? How is it measured?

The measurement of the thermal energy of the particles of a substance. It is measured with a thermometer in degrees- Celsius in the metric system, Fahrenheit in the standard units

4. What are the three primary ways heat can be transferred?

Conduction, Convection; Radiation

5. What are the characteristics of conduction?

Heat transfer between two objects that are directly touching, usually solids. Thermal energy moves through the particles in order from one end of the substance to the other.

6. What are the characteristics of convection?

Heat transfer through liquids or gasses. Because particles of liquids and gasses can move freely, a current is created in convection. Hot liquid or gas is less dense, and so rises to the top, colder liquid or gas is more dense and sinks to the bottom, creating a constant movement of the particles if the heating source is uneven.

7. What are the characteristics of radiation?

Heat transferred in the form of wave energy. This type of heat transfer does not need to pass through matter. It travels outwards from the source of heat in all directions at once. Dark colored objects tend to absorb more than light colored objects. The sun and microwaves both warm through radiation

8. What are conductors and insulators?

Conductors are things that transfer heat or sound easily, the particles are very close together (metals are good conductors)

Insulators are things that do not transfer heat or sound easily, the particles are more spread out. (Styrofoam is an insulator,)

9. What are some substances that are good conductors?

Substances with tightly packed particles are good conductors, like metal

10. What are some substances that are good insulators?

Substances with more spread out particles do not pass thermal energy as easily, and so are good insulators. Examples are styrofoam, wood, and cotton

11. How does heat change matter?

Heat can cause matter to change state (as the particles gain more energy), it can cause physical changes (like expanding and shrinking) and it can cause some matter to have a chemical reaction, like burning, which releases the energy stored in the material and fundamentally changes the matter. A change in state can be reversed, a chemical change and burning, cannot.