Heat and Energy Study Guide

Words to know:

- Heat: a type (or force) of energy
- Contract: to get smaller
- Expand: to get bigger
- Conductor: an object that lets heat pass through easily (examples: metal, copper, steel)
- Insulator: an object that does NOT let heat pass through easily (examples: wool, cotton, fur, plastic)
- Conduction: when heat moves from one thing to another (through solids): **such as when heat moves through a pot to the water in the pot**
- Convection: when heat moves from one place to another (through liquids or gases): **such as the heat at the bottom of a hot air balloon, which warms the air inside the balloon and causes the balloon to rise.**
- Radiation: when heat moves through space: **such as heat waves from the sun**

Facts to Know:

- When matter loses heat it contracts & when matter gains heat it expands.
- The cracks in sidewalks are caused by the sidewalk expanding and contracting when it gets hot and cold.
- When heated enough: solids become liquids and liquids become gases.
- When you drop ice into hot water, the heat will move from the water to the ice until they are both the same temperature. (The ice will melt and go from a solid to a liquid.)
- Dark objects absorb more of the suns energy than light objects.
- Scientists measure heat (how fast molecules move) with a thermometer.
- Scientists describe heat using degrees Celsius (^{O}C).
- Heat always moves from warmer objects to colder objects
- Most metals are good conductors. Glass and ceramic materials also conduct heat, but not as easily as most metals do.
- Wood, paper, rubber, styrofoam, and plastic are good insulators.
- We use insulators like fiberglass to help keep buildings warm. Blankets and jackets also act as insulators keeping our body heat trapped and keeping us warm.
- Animals have fur and body fat (blubber), which are natural insulators

Be Able to Explain:

- Why would it be a good idea to bring your hot lunch to school in a lunch box instead of a paper bag?
- Your mom is making macaroni-and cheese for dinner. She accidentally leaves the metal spoon in the pot of boiling water while she goes to get the noodles. When she returns with the noodles, she picks up the spoon out of the pot and burns her hand. Why was it not a good idea to leave the spoon in the pot?
- The three ways that heat travels: conduction, convection, and radiation.