

Name: \_\_\_\_\_

Science 7

Date: \_\_\_\_\_

Thermal Energy and Heat

**Aim:** I can identify and describe the three methods of heat transfer.

**Do Now:** Convert the following temperatures.

1.  $83^{\circ}\text{C}$  to  $356\text{K}$

2.  $543\text{K}$  to  $27^{\circ}\text{C}$

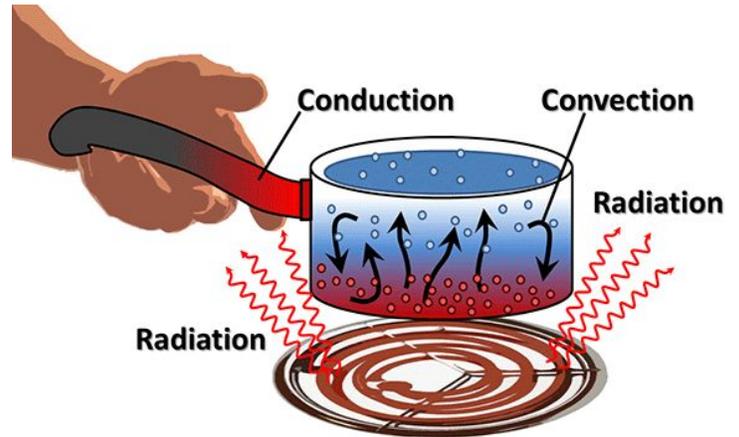
3.  $54^{\circ}\text{C}$  to  $327\text{K}$

4.  $400\text{K}$  to  $127^{\circ}\text{C}$

**Notes:**

### Conduction

- Heat is transferred by direct contact of molecules
- solid objects work best
- **Examples of Conduction:** your feet touching hot sand, your hand touching a hot pot handle, air warming up by touching hot water or sand



### Insulators

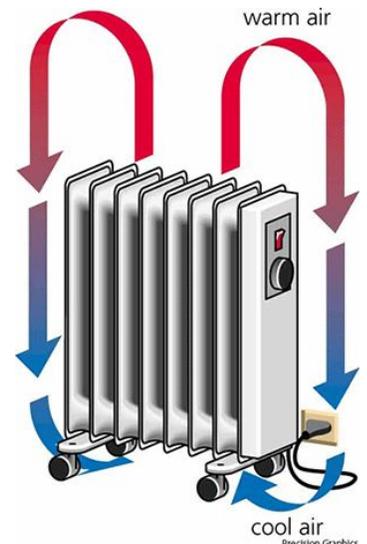
- Do not conduct heat easily
- Examples: wood, paper, wax, air, house insulation, plastic, oven mitts, cloth

### Conductor

- Materials that allow heat to move through it easily
- Examples: Metals (copper and silver) are the best

### Convection

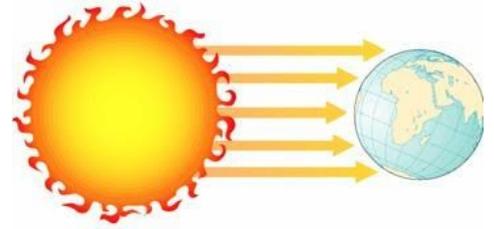
- Transfer of heat in liquids and gases (fluids) by density differences
- When fluids are heated their particles move faster and farther apart.
- Heated fluids become less dense and rise to the top, cooler fluids are more dense and sink.
- **Examples of Convection:** Warm air rises, cool air sinks by means of convection currents, convection currents in the earth, boiling water



cool air  
Precision Graphics

## Radiation

- Heat transfer through empty space
- Can travel when no matter is present (vacuum)
- **Examples of Radiation:** Heat energy from sun, stars, fire



## Examples:

*Identify the method of heat transfer taking place (**conduction, convection, radiation**). More than one process may be occurring.*

1. Hot coffee is stirred with a spoon; the spoon gets hot due to conduction.
2. A chair is placed several feet from a fire in a fireplace. The fireplace has a glass screen. The side of the chair facing the fireplace gets warm because of radiation.
3. A certain type of decorative lamp contains colored liquids. These liquids form globs that break off and rise to the top of the liquid. The globs rise due to convection.
4. Near the ceiling of a room the air is warmer. The warm air rises because of convection.

