Honors Physical Science 2018
Ch 16.1-2 Temperature, Heat, Thermal Energy

Name: Key
Period:

1. Define heat. Describe the heat flow based on the picture (hand holding ice).

- Transfer of thermal E from one obj to another because of a temp. differential
- Heat flows from ↑ temps to ↓ temps, so from hand to ice cube

2. We used to think of temperature as how hot or cold something is, but now we are focusing on temperature as related to something else. Explain and include the acronym discussed in class.

Temp is related to to avg KE of the particles in an object.
"When you are sick, you T.A.K.E. your temp (temp avg K.E.)

3. Describe the three temperature scales making sure to include their units.

Farenheit: Freezing of water 32°, boiling of water 212°
Celsius: Freezing of water 0°, boiling of water 100°
Kelvin: SI Units 0K is absolute zero where all matter stops moving. Same size degrees as Celsius.

4. What is thermal energy? How is this different than mechanical energy?

Thermal E = PE + KE ... related to the motion of all the particles in an object.
ME = PE + KE of an object

5. Give an example that illustrates how thermal energy depends on mass.

cup of tea teapot

same temp but more particles so more thermal E.

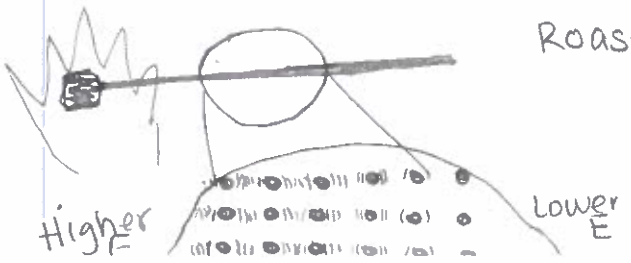
6. Give an example that illustrates how thermal energy depends on temperature.

cup of hot tea cup of cold tea

same mass but avg KE in hot tea is higher, so it has more thermal E.

7. Draw an example of conduction and explain on a molecular level.

- Transfer of thermal E w/no overall transfer of matter.
- Occurs when matter is touching - direct contact of particles



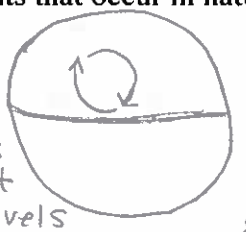
Roast marshmallow w/metal roasting fork

8. Why is conduction in gases slower than in liquids and solids?

particles in gases are more spread out which means they collide much less

9. Convection, which occurs in fluids, is very important! Sketch and describe three examples of convection currents that occur in natural cycles.

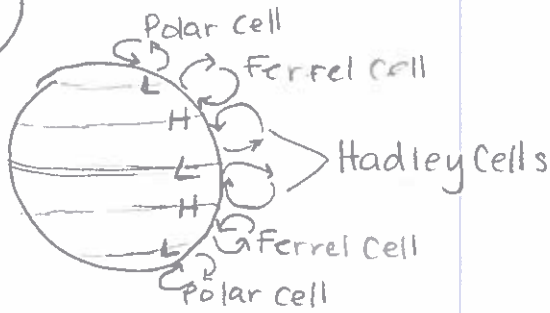
a. ocean currents



Thermohaline Conveyer Belt

warm water from the equator travels toward the poles, it cools, sinks, and travels back toward equator

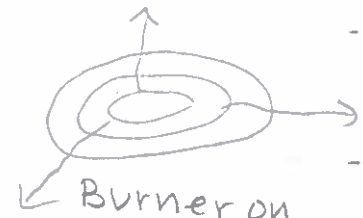
b. weather systems



warm air at the equator rises, cools, sinks forming Hadley cells

c. asthenosphere

10. Describe an example of radiation. Why is radiation unique?



- transfer of thermal E by EM waves through space
- Radiation does not require a medium - it can travel through empty space

Burner on stove radiates thermal E in all directions