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DATE: Mon Oct 25, 2021

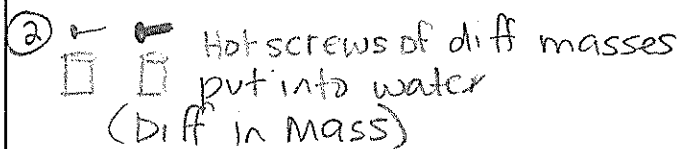
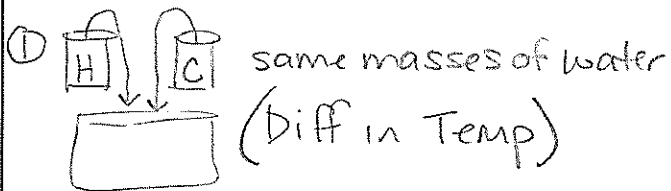
TOPIC: Temperature, Thermal E, and Heat

ESSENTIAL QUESTION: Compare & contrast the relationships between temp, Thermal E, and heat (Obj 3). Describe how thermal E is transferred by conduction, convection & radiation (Obj 4).

QUESTIONS AND CONNECTIONS:

QOD: What is the relationship between temp, T.E. & heat?  
Temp units...  
Describe the movement of part. w/  $\uparrow T \dots \downarrow T \dots$

Describe conditions needed for heat transfer.



③ Metal seatbelt & cloth seat in sun all day long...

\* Which heats up & cools down faster, land or water?

NOTES:

\* When you're sick, TAKE your temp! same size degrees

Temp: Avg KE of particles (F, C, K)  
- K is absolute scale, no neg #'s, Abs. zero  
-  $K = C + 273$

Thermal E: KE + PE of particles (Joules)

- contrast w/ M.E.
- depends on mass, temp, phase

Heat: transfer of Thermal E from  $\uparrow T \rightarrow \downarrow T$

- EX: ice in hand (heat flows from hand to ice)
- (Joules)

\* In order to have a transfer of Thermal E (heat), you must have a diff. in temp.

Using your prior knowledge, predict or explain...

→ Resulting water will be in between H & C. Heat will be lost by H. & gained by C.

→ Lg. screw has  $\uparrow T.E.$  which results in more E being transferred to the water.  $\uparrow \Delta T$

- Sm screw has  $\downarrow T.E.$  which results in less E being transferred to the water  $\downarrow \Delta T$

→ metal seatbelt is hotter because it has a lower specific heat.

- cloth seat is not as hot because it has a higher specific heat

\* Specific Heat - E required to change the Temp of a 1 kg sample by 1°C or K.

EX: 4,184 J/kg·C or 4.184 J/g·C

**QUESTIONS AND CONNECTIONS:**

**NOTES:**

What are the three types of heat transfer?

Conduction - Direct contact of particles

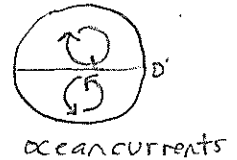
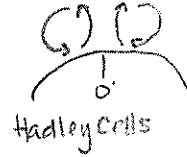
- no transfer of matter
- Between 2 obj or within 1 obj



Convection - Transfer in fluids (g or l)

- matter moves from 1 place to another
- part near heat source gain E, move faster, become less dense & rise. They are farther from heat source, cool down, condense & sink.

- EX:



3 EX: of convection in Earth's spheres?

Radiation - Transfer via EM waves

- no need for medium
- all obj emit
- $\uparrow T$  emit  $\uparrow$  Radiation

**SUMMARY:**