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Thermodynamics Review

Vocabulary:

1. ____The 0th Law
2. ____The 1st Law
3. ____Kelvin
4. ____Joule
5. ____BTU
6. ____Radiation
7. ____Calorimetry
8. ____The 3rd Law
9. ____Potential Energy
10. ____Entropy
11. ____Specific Heat Capacity
12. ____Calorie
13. ____Conduction
14. ____Endothermic
15. ____Convection
16. ____Energy
17. ____Heat
18. ____The 2nd Law
19. ____Kinetic Energy
20. ____Exothermic

A. The capacity to do work or produce heat
B. Energy due to position
C. Energy due to motion
D. Thermal equilibrium, temperature exists, Ralph Fowler discovered it in 1935
E. If it can't be changed or transferred, engines don't/can't do work, transfer or thermal energy
F. Defines entropy, always increasing, only when it has reached thermal equilibrium
G. Transfer from touching objects, feel the heat when you touch a hot object
H. Electromagnetic waves, heat at a distance
I. Measure of energy dispersal in a system, chaos, disorder
J. Would feel cool, energy into a system
K. Not a variant of temperature, no degree symbol, can't be negative, only true form of heat energy
L. Increasing the energy of a closed system is equal to the heat minus work, energy conserved
M. Heat needed to raise temperature of 1 pound of water 1*F, British Thermal Unit
N. Feels warm, energy out of a system
O. Heat released or absorbed during a physical or chemical change
P. Energy transfer from density variations that cause currents, why upstairs is hotter
Q. Heat needed to raise the temperature of 1 gram water 1*C
R. The International System for measuring heat
S. Developed by Walter Nernst in the early 1900's, absolute zero exists but can't be found
T. How easily heat can transfer through an object

Problems:

1. What is the specific heat of water expressed in J/Kg*C

a) 1 J/Kg*C b) 2.3 J/Kg*C c) 4.81 J/Kg*C d) 4.18 J/Kg*C

2. What is the specific heat of water expressed in Kcal/Kg*C

a) 1 Kcal/Kg*C b) 2.3 Kcal/Kg*C c) 4.81 Kcal/Kg*C d) 4.18 Kcal/Kg*C

3. What is the lowest possible temperature, but is impossible to reach?

4. What is 318K in Celsius?

5. What is 35*C in Kelvin?

6. How many calories in 13 dietary Calories (kcal)?

7. An elephant has a specific heat of 0.983 kcal/kg*C. The elephant's mass is 815 kg. How much would a 726kcal bowl of peanuts raise the elephant's temperature? $q = mc\Delta T$

8. A 2kg basketball can transfer all of its energy into heat energy. If it falls from a height of 13m into a 5kg cup of water, how much will the temperature be raised? (c=4180kgJ/*C) (Hint: use gPE=mgh first)

Tips and Tricks:

1. Underline the important numbers and words in what you are given.
2. Double check the units.
3. Make sure to convert if conversions are needed.
4. Remember K is 1,000 (kg, kcal, km).
5. A tip to remembering the 4 laws of thermodynamics is to think 0 equilibriums, 1 energy, and 2 entropy makes 3 temperates.