Name: _____ **Energy Study Guide**

1. What is energy? Ability to cause change

2. List and define the two classifications of energy? Identify the formula for each
   - Potential → Stored → Mass × Ht. / Kinetic → Motion → $\frac{Mass \cdot Velocity^2}{2}$
3. Which has more energy, a 6kg ball at 6m or a 7kg rock at 5m?
   $6 \times 6 = 36J$ $7 \times 5 = 35J$
4. Which has more energy, a 2kg mass at 10m/s or a 20kg mass at 3m/s? → $\frac{20 \times 3^2}{2} = 90J$
   $\frac{2 \times 10^2}{2} = 100J$

Identify each of the following as Kinetic (K) or Potential (P)

P A battery
K Electricity
P The sugars and starches in food
K An airplane taking off
P The peak of a jump on a trampoline

P Spring Loaded Nerf Gun
P Diver standing on top of a tower
K Thermal Energy
K Water in a waterfall
P A bent ruler

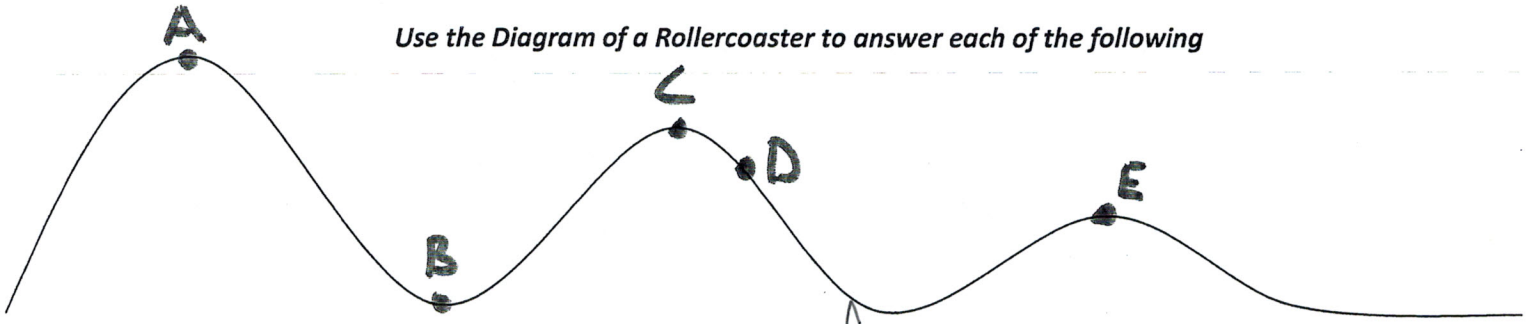
5. What does the Law of Energy Conservation state?
   Energy Cannot Be Created or Destroyed
6. List and explain the **7** forms of energy (Identify their classification and what is in motion if it applies)
   1) Mechanical (K)
   2) Thermal (K)
   3) Sound (K)
   4) Electrical (K)
   5) Chemical (P)
   6) Electromagnetic (K)
   7) Nuclear (P)

Identify the Energy Transfer

Lamp	*The Sun*	*Car on Highway*	*Microwave*	*Music from a Speaker*
E (T) Em	N (T) Em	C (T) M	E (T) Em	E (T) S

7. During all energy transformations, Thermal energy is present.

Use the Diagram of a Rollercoaster to answer each of the following



Which point of the rollercoaster has the most potential energy? A

Which point of the rollercoaster has the most kinetic energy? B

Which points of the rollercoaster have the least potential energy? B and E

Does C or E have the most potential energy? C

Identify each form of energy that is present on a rollercoaster?

Thermal, Electrical, Mechanical, Sound, Electromagnetic

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8. What is heat? Flow of thermal energy

9. List and explain the three types of Heat Transfer
   a. Conduction - Direct Contact
   b. Radiation - Empty Space
   c. Convection - Movement of a Fluid

Identify the type of Heat Transfer that is being described

10. 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.

11. 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.

12. Near the ceiling of a room the air is warmer. The warm air rises because of Convection

13. A college student holds the back of his hand near an iron to see if it is hot. Heat is transferred to his hand by Radiation

14. A heater is placed under one corner of a water bed mattress. Warm water moves throughout the mattress because of Convection

15. A certain type of stainless steel cookware has a layer of copper applied to the bottom to help it heat evenly. The copper transfers heat to the pan by Conduction

16. In a swimming pool, the water near the surface is slightly warmer. The warm water rises because of Convection

17. One end of a copper rod is placed in a flame of a Bunsen burner. Small pieces of wax placed along the rod melt at progressively larger distance from the flame. Heat is transferred through the rod by Conduction

18. A house burns down. On the house across the street, all of the vinyl siding is twisted and warped by the heat. The heat was transferred across the street by Radiation.

19. Warm air over the beach rises while cooler dense air from the ocean rushes in due to Convection.

20. The metal skewer gets so hot that you drop your marshmallow in the campfire because of Conduction

21. You lay on that same rock at night so that you can keep warm by Conduction.

22. A fireman feels a door and it is hot from the fire on the other side due to Radiation

23. The cause of weather systems on earth is Convection.

24. You are in the top bunk of a bunk bed and you want to turn the air conditioner on while your friend on the bottom bunk is fine is caused by Convection