ICP—Work, Power, and Energy Study Guide

Name ____________________________

Directions: Use your online notes, worksheets, and lab papers to complete this review guide.

Part A. Complete this chart. One has been completed for you as an example of what you need to do!

Work	Power	Potential Energy	Kinetic Energy
Formula: Work = Force x distance	Formula:	Formula:	Formula:
Units: work = Joules (J) Force = Newtons (N) Distance = meters (m)	Units:	Units:	Units:

Part B. Complete each of the questions below. These questions do NOT have to be written in complete sentences.

1). What is the definition of work? How does it relate to energy?

2). What is the definition of power? How does it relate to energy?

3). Define and explain potential energy, then identify on a roller coaster where the greatest potential energy is located.

4). Define and explain kinetic energy, then identify on a roller coaster where the greatest kinetic energy is located.

5). Where on a roller coaster is kinetic energy converted to potential and vice versa?

6). Consider a swinging pendulum:
a). Where does the pendulum have the most potential energy?

b). Where does the pendulum have the most kinetic energy?

c). What causes the pendulum to “lose” energy (slow down and not go as high)?

d). Energy can’t be destroyed, so what happens to the energy “lost” by the pendulum?

7). Can you create or destroy energy? Answer yes or no, and defend your answer using an appropriate law we have discussed.

Part C. Solve these problems.

8). A conveyor belt exerts 150 Newtons of force over 15 meters. Calculate the work done by the belt.

9). A light bulb does 660 Joules of work in 11 seconds. Calculate the power of the light bulb.

10). The Bonneville Dam on the Columbia river separates Washington and Oregon. It is 60 meters high, and it holds back 2200-kilograms of water at any one time. Calculate the potential energy of the dam.

11). A 556-kilogram wrecking ball moves at a speed of 20 meters/second (m/s) just before it hits the side of a building. What is the kinetic energy of the wrecking ball?

Part D. Where Did the Energy Go? Read the scenario below and determine the flow of energy in each situation. Use **M**echanical, **T**hermal, **L**ight, **N**uclear, **E**lectrical, or **C**hemical under Type of Energy.

12. Scenario 1: A person eats lunch. Then, goes outside for a 5-mile jog and breaks a sweat.

Action	**Type of Energy**
Chewing	
Digestion	
Jogging	
Sweating	

13. Scenario 2: A wind powered plant provides the power for a family to use their electric stove. Someone boils water for mac and cheese.

Action	**Type of Energy**
Wind power	
Electricity for stove	
Boiling water	
Cooking Mac and Cheese	

Part E. Identify if the example is an example of potential energy or kinetic energy.

14.) Potential versus Kinetic Energy. Write **P** for examples of potential energy, and write **K** for examples of kinetic energy. You can use both **P** and **K** to answer the same question.

____________ A person sitting in a moving car.

____________ The yoyo as it spins.

____________ A person sitting at the top of a picnic table.

____________ A student who was just “frozen” playing tag.

Part F. Find your vocabulary. Study every word on the page. Staple it to this review guide.