Assignment: 2

Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hour:\_\_\_

**Potential and Kinetic Energy Equations and Questions**

1. What is the difference between potential and kinetic energy?
2. An elephant and a mouse are sitting on the edge of a cliff, who has more potential energy? Who has more kinetic energy?

1. Describe an example where potential energy would turn into kinetic energy.

**Equations and Units:**

1. What is the potential energy of a roller coaster at the top of a hill that has a mass of 250 kg and is at the peak 100 m above the ground?

1. What is the potential energy of a diver on the edge of a diving board 10 m above the water who is 50 kg?
2. What is the kinetic energy of a 2 kg basketball shot with a velocity of 10 m/s?
3. A roller coaster cart that is 250 kg is traveling down a hill at a rate of 100 meters per second, what is its kinetic energy?
4. What is the kinetic energy of Cooper who is 10 kg running after a ball travelling 10 m/s?
5. What is the kinetic energy of a 75 kg roller skater who is skating 5 m/s?
6. What is the potential energy of a rock on the edge of a cliff 100 m high that is 2 kg?

**Work Notes**

**What is the physical science definition of work?**

* A \_\_\_\_\_\_\_\_ must be applied
* The \_\_\_\_\_\_\_\_ is applied over a distance
* So the equation is

Work = \_\_\_\_\_\_\_\_\_ X \_\_\_\_\_\_\_\_\_\_\_\_ **Units:** Work =

Force =

W = Fd Distance =

**So does that mean…**

* If a guy pushed on the car and it didn’t move, he did not do any work????
* \_\_\_\_\_\_\_. According to the definition, unless the car \_\_\_\_\_\_\_\_\_, no work was done by the man.

**What are Joules?**

* In order to simplify the units for work, it was decided that

**1 Joule** = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

SO: As long as Force is in \_\_\_\_\_\_\_\_\_\_\_\_ and distance is in \_\_\_\_\_\_\_\_\_\_\_\_, the unit of work is \_\_\_\_\_\_\_\_\_\_\_\_\_\_ (J)

**Work Equations and Questions**

1. Determine whether work was done on the underlined item:
   1. A bottle of ketchup is picked up off the counter. Yes or No. Explain why?
   2. A student leans against the brick wall of the school. Yes or No. Explain why?
   3. A rock sits on the porch. Yes or No. Explain why?
   4. A softball player hits a ball to the outfield. Yes or No. Explain why?

Equation Problems (show work and include units):

1. A crane uses an average force of 5200 N to lift a girder 25 m. How much work does the crane do on the girder?
2. An apple weighing 1 N falls a distance of 1 m. How much work is done on the apple by the force of gravity?
3. A bicycle’s brakes apply 125 N of frictional force to the wheels as the bikes moves 14.0 m. How much work do the brakes do?
4. A mechanic uses a hydraulic lift to raise an 11,760 N car 0.50 m off the ground. How much work does the lift do on the car?

Compare Workloads (show work and include units):

1. Which would be more work, lifting a 20N object 2 meters, or lifting a 25 N object 1.5 meters?
2. Which would be more work, pushing a 2000 N object 50 m, or pushing a 2500 N object 40 m?