Energy Notes

What is Energy?

 Nobody Knows! We know only what it does.

 It’s the Stuff of the universe that allows us to do work.

 It makes stuff happen

 Any force working over a distance is using energy

 Examples:

Law of Conservation of energy

 Energy cannot be created or destroyed, only transformed.

 Energy “types” actually don’t exist either. It’s just about locations.

 What is the energy transformation for a bouncing ball that is dropped?

High up in the air🡪falling down 🡪 hitting the ground🡪 bouncing up 🡪 in the air

Gravitational PE🡪Kinetic Energy🡪elastic PE and sound🡪Kinetic🡪Gravitational PE

Why can’t a ball bounce as high as it started again? Where does the energy go?

Kinetic Energy

 Energy of motion

 Affected by the mass of the object and its velocity

 Doubling mass double the energy. Doubling velocity quadruples energy!

 KE= ½ mv2

Kinetic energy includes thermal energy, sound energy, light energy, electrical

Potential Energy

 Energy that is “stored” due to position. Affected by distance and mass (or charge)

 Gravitational PE= mgh

m=mass g=acceleration from gravity=10 m/s2 h=height

Gravitational, elastic, chemical, and nuclear are all types of potential energy

1. A man with mass of 100 kg is going to jump from an 8 m platform into a pool. What amount of gravitational Potential energy will he have?

2. A 60 kg man is running at 5 m/s. How much kinetic energy does he have?

3. Challenge\*: The man from problem 1 would have all kinetic energy right before he hits the water. How fast would he be moving at this point?

4. Write the transformation of energy for a roller coaster at points A, B, and C. Why doesn’t the second hill go as high as the first?

 

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 It’s the Stuff of the universe that allows us \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

 It makes stuff \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Any \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ working across a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is using energy

 Examples:

Law of Conservation of energy

 Energy cannot be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, only transformed.

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Why can’t a ball bounce as high as it started again? Where does the energy go?

Kinetic Energy

 Energy of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Affected by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the object and its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Doubling mass \_\_\_\_\_\_\_\_\_\_\_\_ the energy. Doubling velocity \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy!

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Kinetic energy includes \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_ energy

Potential Energy

 Energy that is “stored” due to \_\_\_\_\_\_\_\_\_\_. Affected by \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_ (or charge)

 Gravitational PE= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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