ENERGY

WHAT IS ENERGY?

- The ability to do work.
 Work is defined as being able to move something over a distance.
- Measured in Joules (J).

TYPES OF MECHANICAL ENERGY

- Gravitational Potential Energy
- Kinetic Energy
- Spring Potential Energy

GRAVITATIONAL POTENTIAL ENERGY (PEg)

- The energy stored in an object when it can be pulled downwards by gravity.
- If you are above ground, you have PEg.
- Formula:

 $PE_q = mgh$

KINETIC ENERGY

- •The energy of a moving object.
- If you're moving, you have KE.
- Formula:

$$KE = \frac{1}{2}mv^2$$

CONSERVATION OF ENERGY

- Energy cannot be created or destroyed, it is simply transformed from one form to another.
 - -Pendulum Demo
 - -http://i.imgur.com/WNOBlv2.gifv
 - -https://www.youtube.com/watch?v=09pEcJg9bKs

CONSERVATION OF ENERGY LAB



WORK

• Work is whenever a force causes a displacement. Work is also measured in Joules.

$$W = Fdcos\theta$$

 θ is defined as the angle between the force and the displacement of the object.

ANGLE PRACTICE

 $\boldsymbol{\theta}$ is defined as the angle between the force and the displacement of the object.

- -An elevator lifts an object upwards.
- -An elevator brings an object downwards.
- -An elevator brings an object upwards, but the person wants to go sideways.

PROBLEM



• How much work is done by an elevator lifting a mass of 84 kg up 30 meters?

PROBLEM

Erik Gaytan pushes on a box with a force of 40 N at an angle of 25 degrees downwards. If he pushes the box for 20 meters, how much work did Erik do?

WORK-ENERGY THEOREM

Work can add or take away energy from a system. When work is +, energy is added to the system. When work is -, energy is taken away from the system.

 $W = \Delta F$

PROBLEM

If a 5 kg ball is dropped from a height of 25 meters, how fast is the ball going right before it hits the ground if we neglect friction and air resistance?

If the ball only hits the ground with a speed of 19.6 m/s, how much work did air resistance do on the ball?





POWER

 Power is defined by how much work is done is a certain time frame. The faster you do the work, the more power you generate. Power is measured in Watts.

$$P = \frac{W}{t}$$

