CALCULATING GRAVITATIONAL POTENTIAL ENERGY

Calculating Gravitational Potential Energy

$$Gravitational\ PE = mass \times gravity\ \times height$$

The mass of an object is it's resistance to gravity. Mass is measured in grams (g) or fractions/multiples of a gram (centigrams, kilograms, etc.). For this formula, if the mass is given in a different unit, it must be converted to kilograms.

Gravity refers to acceleration due to gravity. On earth, this is a constant rate of 9.8 meters per second^2 (m/s^2)

Height refers to how high above sea level an object is positioned. Height is measured in meters (m) or fractions/multiples of a meter (centimeters, decameters, etc.). For this formula, if the height is given in a different unit, it must be converted to meters.

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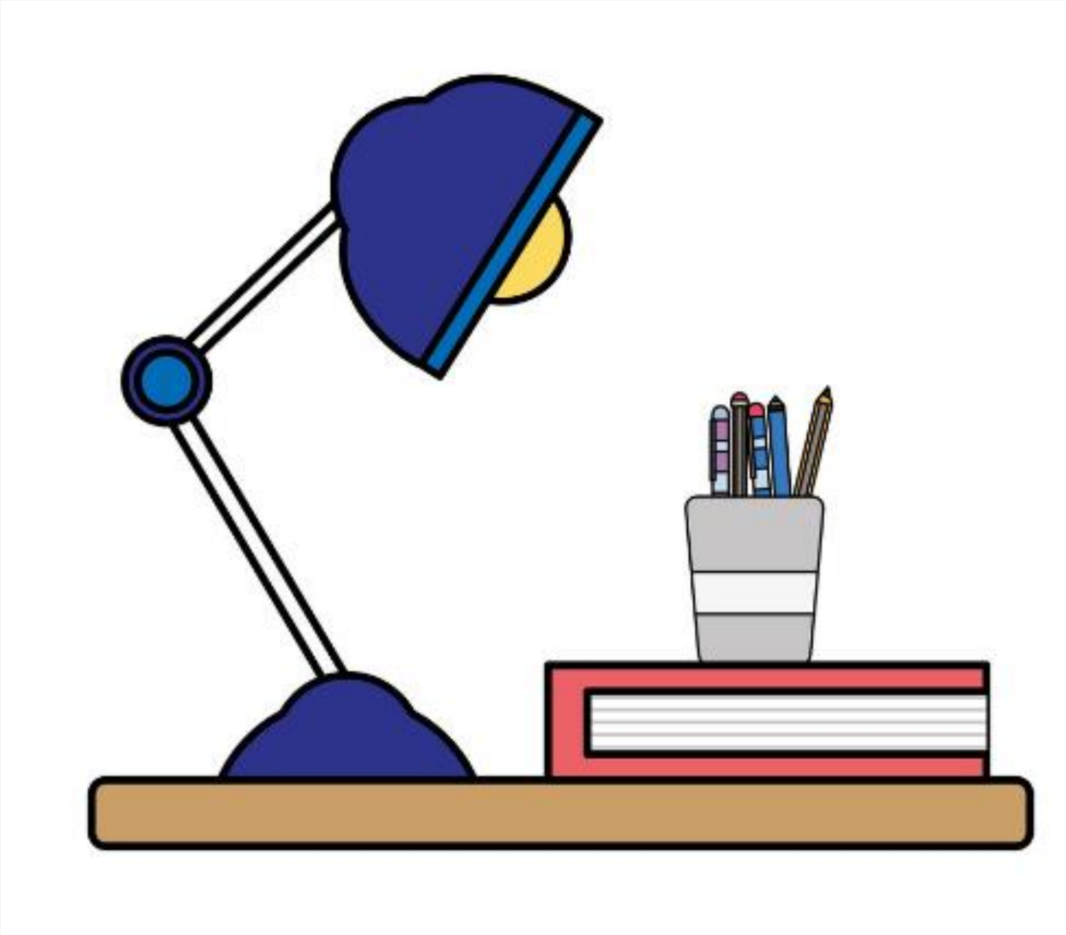

We often shorten the equation to $PE_{grav} = mgh$

Let's assume the lamp has a mass of 9 kg and the shelf is 3 m high. Given these numbers, we can easily find the amount of Gravitational PE the lamp has.

$PE_{grav} = mgh$

Substitute the numbers given for the variables in the formula.

m= 9 kg

g= 9.8 m/s^2 (Remember, gravity on Earth is a constant!)

h= 3 m

$\therefore PE_{grav} = (9)(9.8)(3)$

m * g * h

$$PE_{grav} = mgh$$

Now Multiply!

$$PE_{grav} = (9)(9.8)(3)$$

$$\therefore PE_{grav} = 264.6 \text{ J}$$

Remember to use the correct units!

$$PE_{grav} = mgh$$

The lamp has 264.6 J of Gravitational Potential Energy.

You did it!

$PE_{grav} = mgh$

Things to Remember:

- *Mass must be in KILOGRAMS*
- *Gravity on Earth has a constant rate of acceleration (9.8 m/s^2 ----It never changes!)*
- *Height must be in METERS*