

# CONSERVATION OF ENERGY

Conservation of Energy: \_\_\_\_\_ It is simply converted from \_\_\_\_\_

$$ME = PE + KE$$

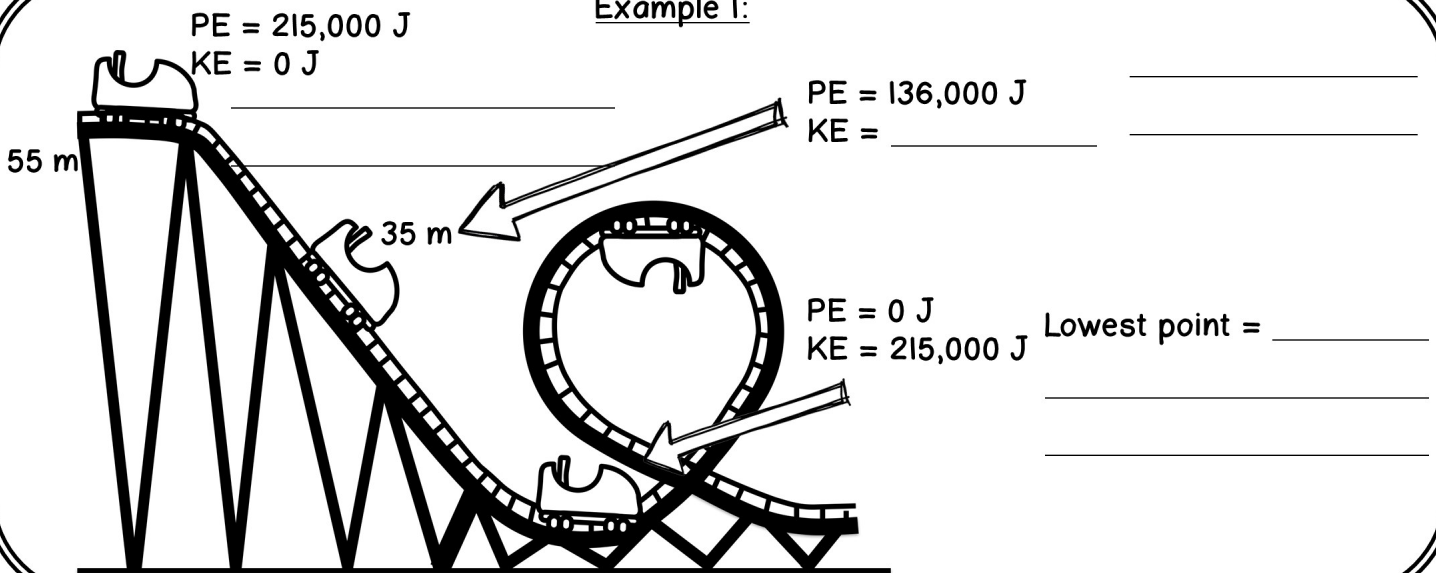
**Mechanical Energy:** The sum of \_\_\_\_\_

**Potential energy:** \_\_\_\_\_

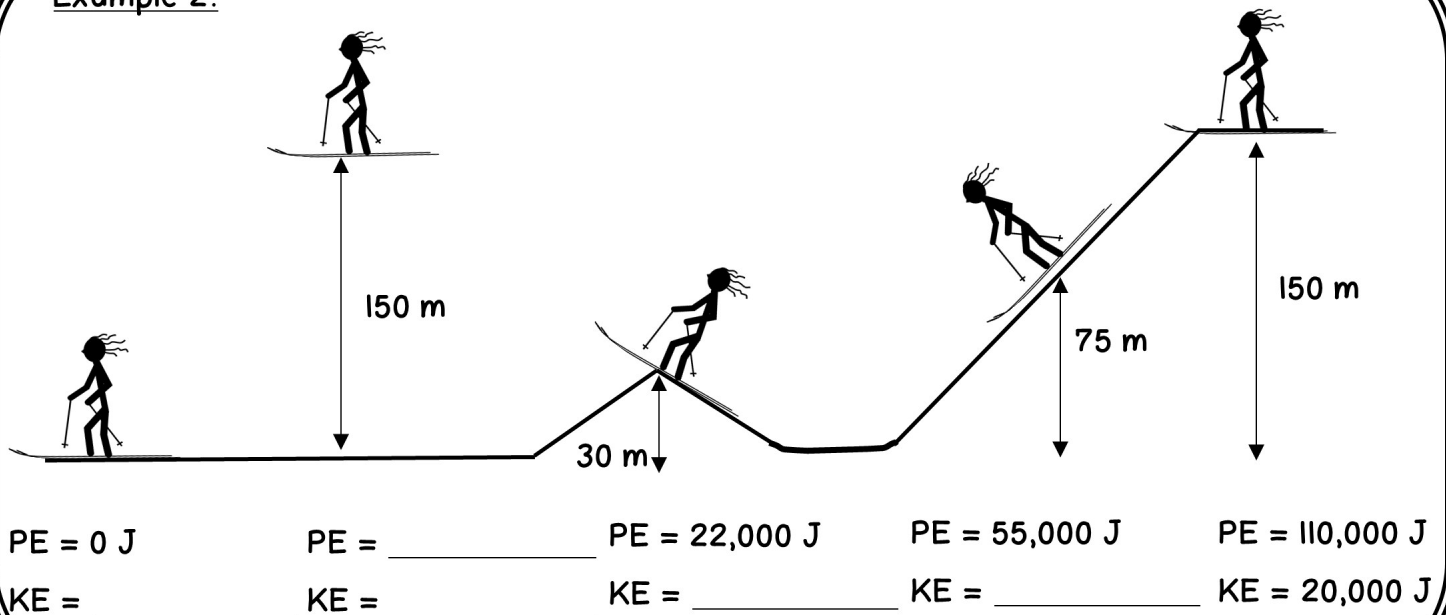
**Kinetic energy:** \_\_\_\_\_

\_\_\_\_\_. Is conserved in frictionless systems.

## Example 1:



## Example 2:



# SOLVING PROBLEMS

You can combine the total mechanical energy, conservation of energy, and the kinetic and potential energy equations in order to solve problems.

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

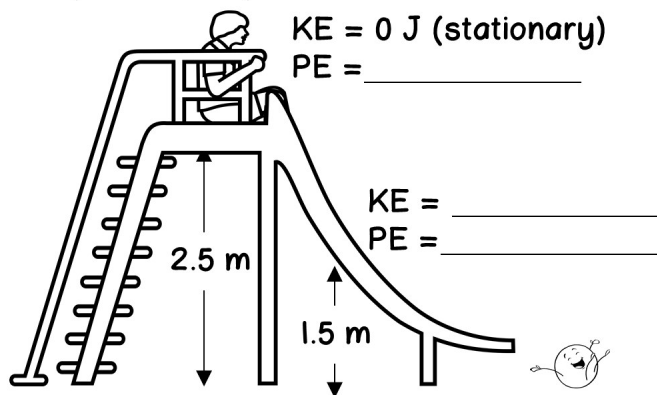
$$KE = 0.5(\underline{\hspace{2cm}})(\underline{\hspace{2cm}})^2$$

$$PE = mgh$$

$$PE = (\underline{\hspace{2cm}})(\underline{\hspace{2cm}})(\underline{\hspace{2cm}})$$

$9.8 \text{ m/s}^2$

1) Consider the picture of the 55 kg kid sliding down the slide. Use the tables as scaffolding to help solve the problems.



- Find the original PE
- Find the PE at the midpoint and the KE.
- Find the KE at the end
- What is the velocity of the kid at the end?

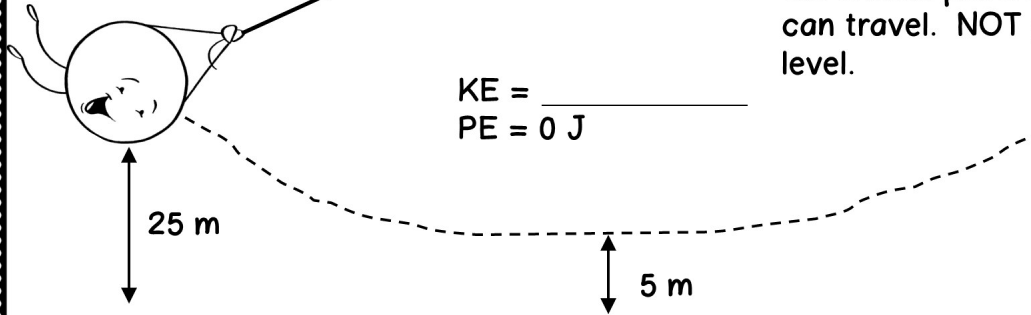
Define Variables	Write equation and show work	Answer w/ units
PE = m = g = h =	$PE = mgh$ $PE = (\text{mass})(\text{gravity})(\text{height})$	

Define Variables	Write equation and show work	Answer w/ units
PE = m = g = h =	$PE = mgh$	

Define Variables	Write equation and show work	Answer w/ units
KE = m = v =		

KE = 0 J (stationary)  
PE = \_\_\_\_\_

NOTE: PE is measured based on the height from the lowest point the object can travel. NOT ground level.



KE = \_\_\_\_\_  
PE = 0 J

Find:

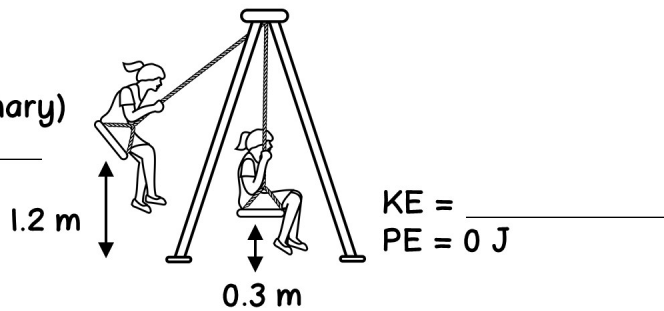
- A) The initial potential energy
- B) Find the KE (SEE NOTE)
- C) The speed at the bottom of the swing.

2) Consider the picture of Dot Dude. Dot Dude has a mass of 4.5 kg and is swinging in the path shown.

Define Variables	Write equation and show work	Answer w/ units
PE = m = g = h =		

Define Variables	Write equation and show work	Answer w/ units
KE = m = v =		

KE = 0 J (stationary)  
PE = \_\_\_\_\_



KE = \_\_\_\_\_  
PE = 0 J

Find:

- A) The initial potential energy
- B) Find the KE (SEE NOTE)
- C) The speed at the bottom of the swing.

3) Examine the kid swinging on the swing. Remind the "note" made up above. The kid's mass is 45 kg.

Define Variables	Write equation and show work	Answer w/ units
PE = m = g = h =		

Define Variables	Write equation and show work	Answer w/ units
KE = m = v =		