

Name \_\_\_\_\_

Period \_\_\_\_\_

## Kinetic and Potential Energy Relationships

### Learning Goals:

- Predict the kinetic and potential energy of objects.
- Examine how kinetic and potential energy interact with each other.

In the space provided, define the following words:


Kinetic energy-

Potential energy-

Open Internet Explorer. From the FMS Jump Page. Click the Potential and Kinetic Energy Skate Park link. Or type in <http://phet.colorado.edu/en/simulation/energy-skate-park>

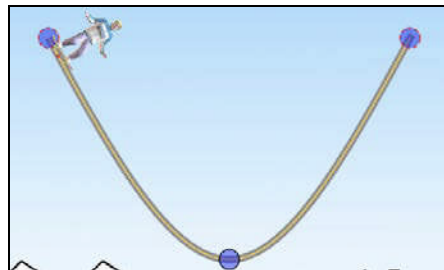
### Observations of KE and PE

Start your skater at the top of the track. Draw or write what happens to the skater.

Position of Skater	Result	Possible reasons why it happened.
		

Bar Graph

Click on **Bar Graph** and run your skater through the track again. Use this tool to help you label the spots on the ramp where there is the greatest **KE** and **PE**. Label your results below:



Watch what happens to the **PE** as the skater is higher on the track.

What is the relationship between the **PE** and the height of the skater on the track?

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## Kinetic and Potential Energy Relationships

Watch what happens to the **KE** as the skater moves faster and slower on the track. He is slowest at the top of the track just before he reverses direction and fastest at the bottom of the bend.

What is the relationship between the **KE** and the speed of the skater on the track?


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Watching the bar graph...what general statement can you make about the relationship between **KE** and **PE**?

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### Effect of Starting Height on PE and KE

Drag and drop your skater half way up the track. Draw or write what happened to the skater.


Position of Skater	Result
	

What do you notice about the bar graph, now, compared to when the skater started higher up on the track?


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### Effect of Length of the Track

Make the right side of the track longer. Start your skater on the right side and draw or write what happens to the skater.

Right side longer	Result	Possible reasons why it happened
		

Make the left side of the track longer with a short right side. Start the skater on the right side again, and draw or write what happens to the skater.

Left side longer	Result	Possible reasons why it happened
		

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### Loops

Under the "tracks" menu at the top of the page, add a loop to the track. Draw or write what happens to your skater when you start it from the top of the track.

Picture of track with loop	Result

Click Show grid.

Show Grid

Start your skater at different positions on the ramp. What happens if you start the skater on the ramp at or below the highest height of the loop?

### Pendulum PE and KE

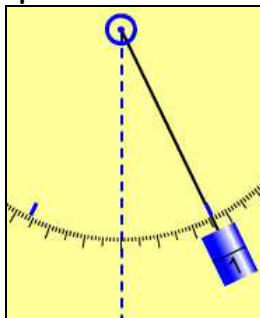
Open Internet Explorer. From the FMS Jump Page. Click the Pendulum link. Or type in <http://phet.colorado.edu/en/simulation/pendulum-lab>

Show energy of:  
 1    2    none

real time  
 1/4 time  
 1/16 time

Click Show energy of 1 ... and 1/16 time

Drag and release the pendulum to set it in motion. Watch the graph of PE and KE. Label the points on the pendulum's path where PE and KE are at their maximum.



How does the PE and KE of the Pendulum compare to the Skate Park?

You may now design your own skate park. Make sure it all works!

You need...

A loop and 2 hills