

You raise a ball to a higher position. The ball starts and ends at rest.

The net work done on the ball is:

☐ positive ☐ negative ☐ zero

The work done by you on the ball is:

☐ positive ☐ negative ☐ zero

The work done by gravity on the ball is:

☐ positive ☐ negative ☐ zero

Write down an expression for gravitational potential energy _____

A ball of mass m is thrown straight up into the air with some initial speed v_0 . It reaches some maximum height h above the launch point and then falls back down. You define the zero level for gravitational potential energy to be the launch point, which is the lowest point on the trajectory. I define the maximum height point to be the zero level for gravitational potential energy.

What we agree on must be far more fundamental than what we disagree on. Which of the following do we agree on?

	Your value	My value
☐ the ball's kinetic energy at launch		
☐ the ball's gravitational potential energy at launch		
☐ the total mechanical energy at launch		
☐ the ball's kinetic energy at maximum height		
☐ the ball's gravitational potential energy at maximum height		
☐ the total mechanical energy at maximum height		
☐ the ball's change in kinetic energy		
☐ the ball's change in gravitational potential energy		
☐ the total change in mechanical energy		

Phet simulation – Energy Skate Park

Go to the Phet site and run the Energy Skate Park simulation. There's a link to the simulation from the NS540 site, too.

From the “Tracks” menu at the top left, select the “Double Well” track and try it out. Note that you can click-and-drag the skateboarder back to the top of the track, or press the “return Skater” button to start again.

What happens to most of the skateboarder's energy?

Check the box beside “Energy Pie Chart.” As time goes by, you should see three different colors. What kind of energy does each color represent?

Check the box beside “Potential Energy Reference” and note that you can drag the reference line up or down. Where does it make most sense to you to put the reference line, which defines the zero level of potential energy?

Make a very smooth track by dragging the middle blue point on the track down, and start the skateboarder off from a high point on the track. Then try switching locations from “Earth” to “Moon” when the skateboarder is at different points on the track. Can you make the skateboarder fly off the track? If so, how can you make that happen?

Now try switching locations from “Earth” to “Space” when the skateboarder is at different points on the track. What do you observe?