

ENERGY SKATE PARK Ver. 2 (Updated for IB-Phys 1)
(1pt each, 14 points total)

Energy Skate Park

1. Go to: <http://phet.colorado.edu/en/simulation/energy-skate-park>
2. Select “Run Now”.
3. Click on “Choose Skater” and, well, choose a skater.
4. Run the Simulation, *Keep all the default settings*, but click “Choose Skater” to manipulate the mass of the skater. **Does mass have an impact? Explain.**

5. Click the Potential Energy Reference check box, then move the blue PE reference to the lowest point in the Track. Click “Bar Graph” to see the Conservation of Energy. **Is this realistic? Explain.**

6. Move the bar graph to the left and alter the Gravity. **What effect does gravity have on the KE, PE, and Total Energy? Why?**

7. Reset the simulation, Adjust the PE level to the lowest point again, then click on “Energy vs Position” to view the Conservation of Energy. **Sketch or paste a screenshot of three cycles of this graph. (remember to crop the screenshot to just the graph and reduce it to minimize file size)**

8. Pause the simulation. Clear the graph. Return the Skater. Adjust the track friction so that it is about a quarter higher than zero. Hit the play button. **Explain what happens.**

9. **At what point(s) in the cycle is the increase in Internal (Thermal) Energy the greatest? Why?**

10. **At what point(s) is there no increase in Internal Energy? Why?**

11. Hit Reset. Keep all defaults (you may change the skater). Click and drag track segments and/or the skater in order to build a track that causes the skater to go over two hills where the first hill is at least 5 meters. (note: every time you hit “return skater” he will return to wherever you last dragged and dropped him). **Once you are successful, sketch or paste a screenshot of your track pattern here.**

12. Keep the track you had in 11. Repeat the prior objective, this time with a small amount of track friction. **What had to be altered on your track in order for the skater to complete the course? Why? Once more also create a sketch or paste a screenshot.**

13. Hit Reset. Keep all defaults (you may change the skater). Create a track that makes the skater do a loop upside down and *then* complete a jump to a new set of tracks. **Once you are successful, sketch or paste a screenshot of your track pattern here.**

14. Keep the track you had in 13. Repeat the prior objective, this time with a small amount of track friction. **What had to be altered on your track? Why? Once more also create a sketch or paste a screenshot.**

15. **Explain how the concepts of *internal energy* and *heat* can be seen in this skate park lab. (You may need to take a peek at chapter 3).**

COMMENTS / IMPROVEMENT: This lab can be improved by:

You may submit this lab electronically or by hardcopy. If submitted electronically, ensure your filename is "LastNameFirstInitialPerXLabName"