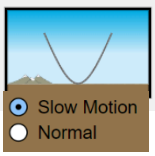
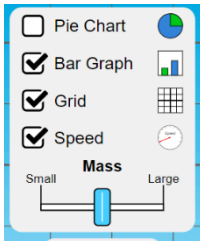
Name: _____ Period: _____ Assigned on Wednesday, November 06, 2024

13.2 Lab: Conservation of Energy Inquiry **Due Wednesday, November 06, 2024**

Instructions: For this lab you will use a simulation provided by Phet. Afterwards, you will play around and answer the inquiry-based questions.
Go to: http://phet.colorado.edu/en/simulation/energy-skate-park-basics





Sim #1: Intro [Check Off Each of the Boxes and Bullets on the Right]
For each scenario, write down your hypothesis about how the energy will change for the skater. Then, play the simulation and write a conclusion based on the simulation.

1. Play around with the simulation and discover what factor increases the Potential and Kinetic Energy of the skater. *(4 pts)*

Potential Energy:

Kinetic Energy:

(Verify your answer by googling the formula for Potential and Kinetic Energy)

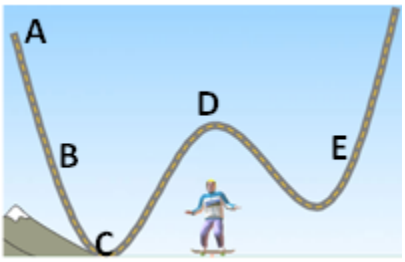
2. Place the skater by the 6-meter mark on the left side of the ramp. How high will the skater reach on the other side? *(2 pts)*
Hypothesis:
Conclusion:

3. How does the skater's Potential and Kinetic Energy change as he/she goes up and down the ramp? Explain. *(2 pts)*
Going Down the Ramp:

Going Up the Ramp:

4. If you drop the skater at the 8-meter mark on the left side of the ramp, what will happen to him on the right side of the ramp? *(2 pts)*

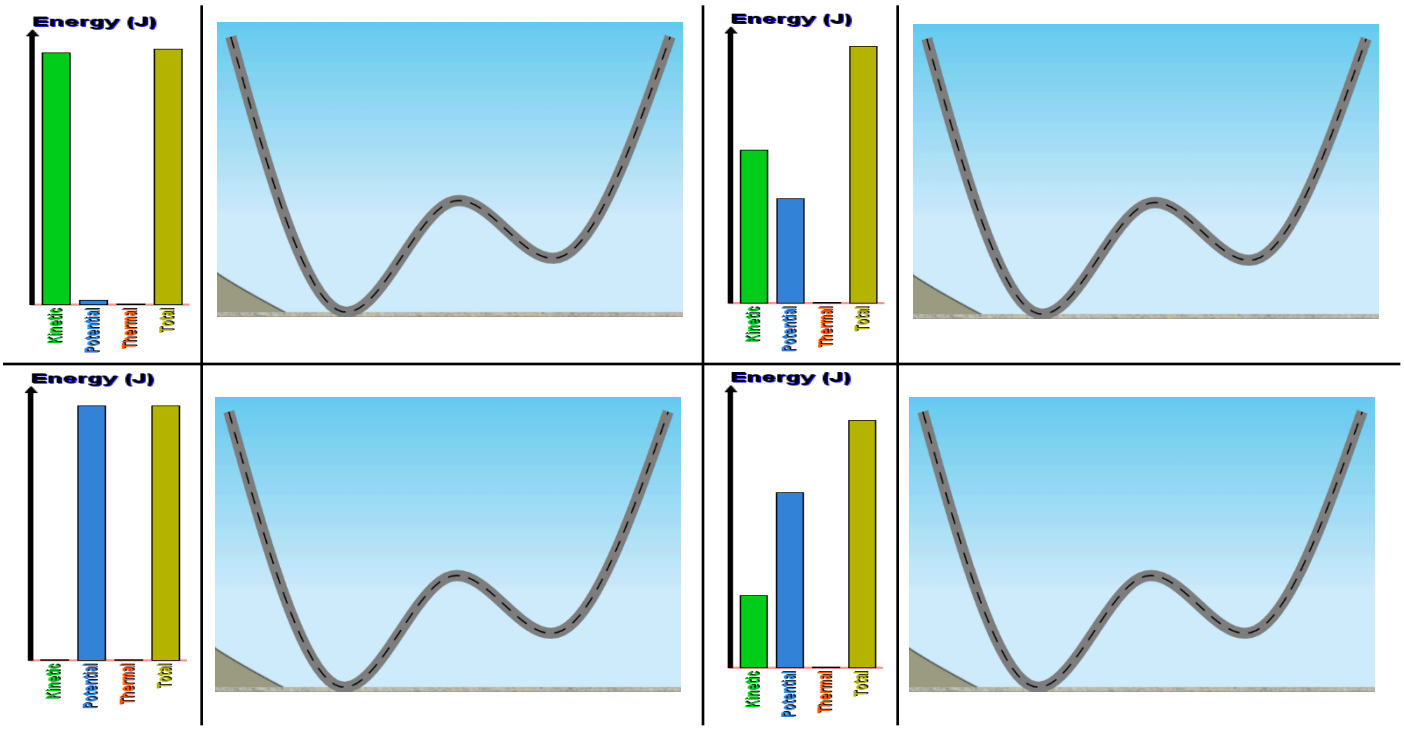
Hypothesis:
Conclusion:



5. Look at this track. At what point or points on this track would the skater have: *(4 pts)*

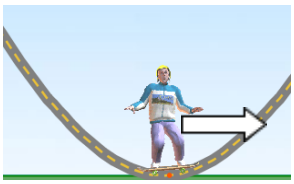
	Hypothesis	Conclusion
The ***most kinetic*** energy?	_____	_____
The ***most potential*** energy?	_____	_____
The ***same kinetic*** energy (two points)	____ & ____	____ & ____

6. Draw all the possible places where the skater might be based on the bar graphs shown. *(8 pts)*

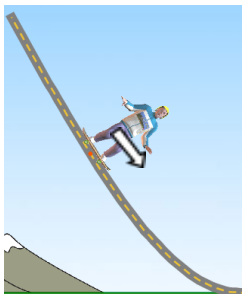


7. Observe the following situations. Draw the possible bar graphs for the situation shown. Compare your results with a nearby lab group, AFTER you have completed this section. *(8 pts)*

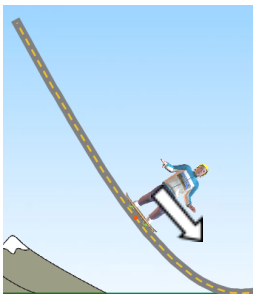
Top of the ramp, stopped for just an instance.



Bottom of the ramp, zooming past the middle.

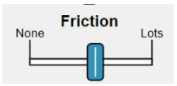


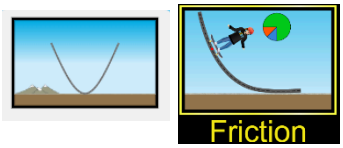
Mid-way down the ramp, moving about mid-speed.



3/4 of the way down the ramp, moving pretty fast.

Sim #2: Friction [Check Off Each of the Boxes]





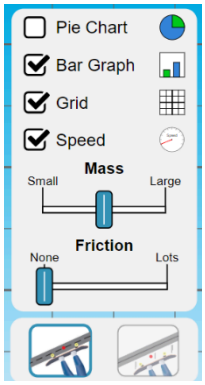
8. Place the skater by the 6-meter mark on the left side of the ramp. Will the skater go higher, shorter, or the same on the other side? *(2 pts)*
Hypothesis:

Conclusion:

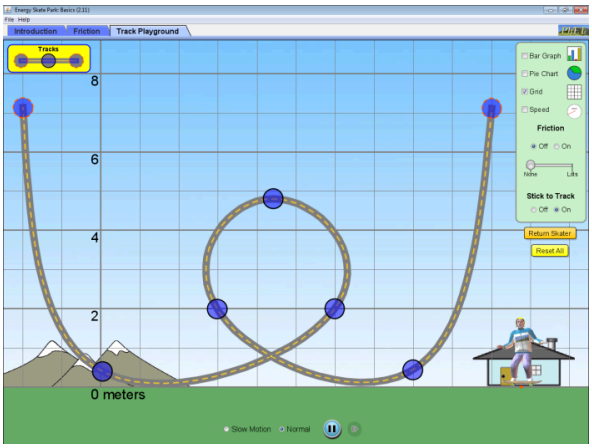
9. If you leave the skater on the tracks, what will eventually happen to the energy of the skater? *(2 pts)*
Hypothesis:

Conclusion:

Sim #3: Playground [Check Off Each of the Boxes & Turn Off Friction]



Using the track pieces in the upper right of the page, build a track with a ***single loop***, like the track shown in the picture below (does not need to be exact). Be sure that the far left and far right of the track are higher than the loop.



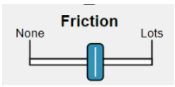
Using the grid, what is the height of the ***top*** of the loop? _____

7. What is the ***minimum height*** you can place the skater so that he makes it all the way around the loop? *(2 pts)*

Hypothesis:

Conclusion:

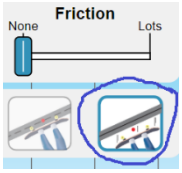
8. If Friction were added to the course, would the skater need to be placed higher or lower in order to make it through the loop? Explain. *(2 pts)*



Hypothesis:

Conclusion:

9. Turn Friction back off as well as the magnetic wheels. This time, will the minimum height that you found for #7 be enough, too little, or too much for the skater to make it around the loop? Explain. *(2 pts)*



Hypothesis:

Conclusion:

10. Create a track of your own. Draw in the diagram below. Label where on the diagram you have the greatest kinetic energy, the greatest potential energy, and two places that have the same potential and kinetic energy. *(4 pts)*