Adventures in Energy Skate Park

Name: _____

Energy can be *transformed* between forms. The primary forms of energy that skaters experience in the half pipe are potential energy and kinetic energy. **Potential energy** is stored energy that is related to height. When skaters are at the tops of the ramps, they have the *highest amount* of *potential energy*.
Kinetic energy is energy of motion. The *faster* skaters move, the more *kinetic energy* they have.
In a half pipe, energy is constantly transformed between potential (at the top) and kinetic energy (as they travel down the sides) as the skater goes back and forth between the ramps. However, they cannot continue this movement forever, due to the force of **friction** which acts against skaters, causing them to slow down unless they apply more force to their movements.

Read the text above to answer questions 1-3.

1. Define potential energy._____

   _____

2. Define kinetic energy. _____

   _____

3. What force acts against the skaters and slows skaters down? _____

   _____

THE LAB ACTIVITY

Purpose *– The purpose of the energy skate park simulation is to see how energy gets transferred in a real world application. In this simulation, you will manipulate the skater and track to determine how it affects the energy of the system..*

START THE SIMULATION: ***Intro*** In this skate park there is no friction.
Put the skateboarder on the ramp and observe the movements of the skater in the half pipe.

1. Does the skater hit the same height on the opposite sides of the track? Use the "pause" button to help you determine this. _____

Now, click on the Pie Chart and the Bar Graph.

2. On the visual aids, what color represents potential energy **and** which is kinetic energy? _____

   _____

3. When does the skater have the highest amount of kinetic energy?

   _____

   _____

4. When does the skater have the highest amount of potential energy?

   _____

_____

5. When does the skater have the lowest amount of kinetic energy? _____

_____

6. When does the skater have the lowest amount of potential energy? _____

_____

***Click on friction at the bottom* Click on the pie chart and bar graph.**

7. What happens to the thermal energy (red) on the bar graph as the skater goes up and down on the ramp? _____

_____

8. How does friction affect the skater and their speed in this simulation (compared to the one without friction)? *Include friction in your answer_____

_____

Click on playground at the bottom ***PART B: CREATING A SKATE PARK***

Experiment with the different tracks that are available and build your idea of the perfect track.

9. Sketch your track below. If your first track did not work (skater got stuck or fell off), design another track. How can you use what you know about kinetic and potential energy to help you with your designs?

CONCLUSION

10. What factor/factors affect the relationship between potential and kinetic energy?

_____

_____

_____

<u>* Just for fun (IF YOU FINISH EARLY!!)</u>

1. See if you can have the skater do two loops. Draw your track.
2. See if you can have the skater go airborne, but land on another track.
3. See if you can have the skater say cow-a-bunga.