

Playing with Energy: Skate Park Simulation

- 1.) Type "Phet skate park simulation" into Google. Click on the link.
- 2.) Click on "INTRO". Play around with the simulation to become familiar with how it works.
- 3.) Click on "**Bar Graph**". Watch as the skater moves across the track and how it changes the levels of Potential and Kinetic Energy. (You can slow or pause the skater down at the bottom of the simulator window to help you observe).

a.) When is the gravitational potential energy the highest?

The lowest?

b.) When is the kinetic energy the highest?

The lowest?

c.) When are the kinetic and gravitational potential energy levels the **same**?

d.) Describe a scenario when the kinetic and gravitational potential energy could both be **zero**.

4.) Click on "FRICTION".

5.) Before changing any settings, send your skater down the ramp. Compare the movement of the skater to the INTRO and explain any differences you note.

6.) Predict what will happen to the following variables if you decrease the mass of the skater:

- a.) Speed
- b.) Potential energy
- c.) Thermal energy
- d.) Kinetic energy

7.) Predict what will happen to the following variables if you increase friction:

- a.) Speed
- b.) Potential energy
- c.) Thermal energy
- d.) Kinetic energy

8.) Check all of your above predictions using a check or an "x".

9.) Click on "PLAYGROUND".

10.) Now you are going to create your own skate park! Your mission is to create a track complete with hills, drops and multiple loops that your skater can complete from start to finish without getting stuck OR flying off! Carefully consider the **relationship between potential and kinetic energy**. Once you have a track that works, sketch it below:

