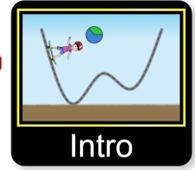
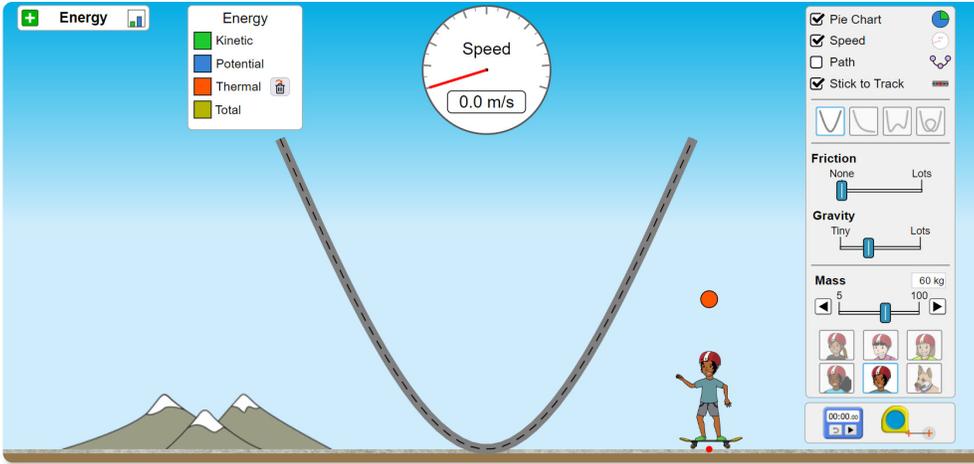


Student Worksheet

Go to PhET Interactive Simulations *Energy Skate Park* and begin with the "Intro"  https://phet.colorado.edu/sims/html/energy-skate-park/latest/energy-skate-park_en.html



- 1) Start with this screen and check the pie chart and the speed as shown below. Choose the skateboarder that you want and then pull them up to a starting position on the ramp.



Press play and watch the skateboarder go back and forth. The kinetic energy of the skateboard is shown in green and the potential energy is shown in blue on the pie graph.

Experiment for awhile.

Work through the following exercises and jot down your observations and answer the questions:

- 2) Increase and decrease the mass of the skater. How does this change the pie-chart diagram? Explain.



- A) What affects the potential energy and what causes it to increase or decrease?

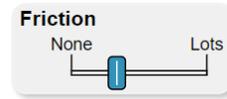
- B) What affects the kinetic energy and what causes it to increase or decrease?

- C) How are potential energy and kinetic energy connected? Explain.

Lesson Credit: PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu>.

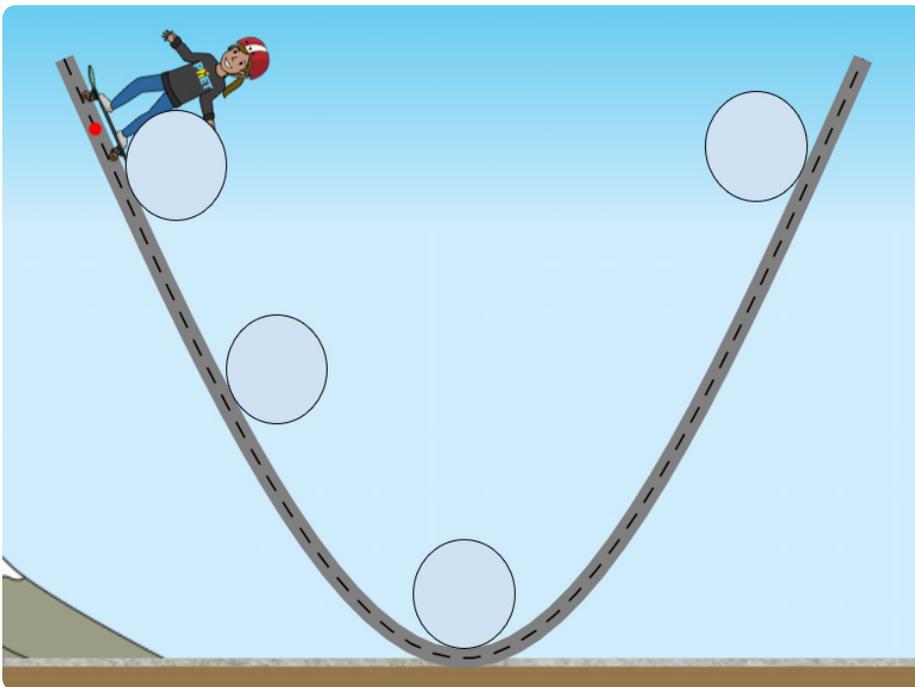
Student Worksheet

3) Now move the friction slider about $\frac{1}{3}$ of the way like this: Drag the skater to the top again and release the skateboarder. Observe the skater moving back and forth.



A) How have things changed now that friction is turned on?

4) Fill in the pie chart for each of the positions shown below:



A) How many times does the skater go back and forth until they stop? Where does the energy go?

B) Where does the initial potential energy eventually go?

C) Where does the kinetic energy eventually go?

D) Does thermal energy ever turn back into potential or kinetic energy?

Lesson Credit: PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu>.

Lesson 1

Student Worksheet

5) Based upon your observations, answer the following questions and prepare to share your answers to the class.

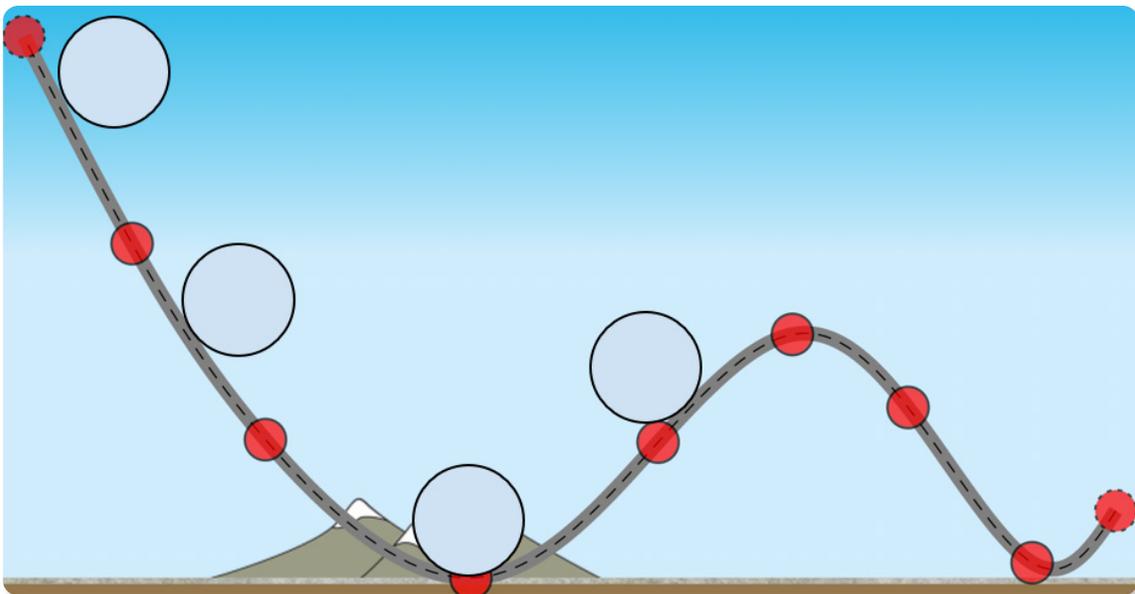
A) What is potential energy? What does it depend upon? Explain.

B) What is kinetic energy? What does it depend upon? Explain.

C) How are potential and kinetic energy related?

D) What is thermal energy? How does it affect the motion of the skater?

E) Using what you've learned so far, fill in the following pie charts for the roller coaster. The roller coaster starts from rest at the top and there is friction.



Lesson Credit: PhET Interactive Simulations, University of Colorado Boulder, <https://phet.colorado.edu>.