**Physical Science Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Energy Skate Park – Lab Simulation**

Access the following website. <http://phet.colorado.edu/en/simulation/energy-skate-park>

The screen should look like this:

Choose the “Run Now” option.

When it opens it will look like this:

Observe the skater as he moves back and forth.

**FIRST:** drag the bottom the skate track down so that it touches the ground. You can drag the skater to the top of the hill to restart the process. Notice that you can adjust the speed of the motion and you can pause it.

1. At the top of the hill, before he starts to move down, he does not have any kinetic energy. At that point, he does have \_\_\_\_\_\_\_\_\_\_\_\_\_ energy because of his height.
2. As he moves down the hill, he loses potential because he loses height. Since he is gaining speed, he is also gaining \_\_\_\_\_\_\_\_\_\_\_\_\_ energy.

**Create a graph** of the different types of energy. Open the bar graph by selecting the button on the right side of the screen.

1. Observe the changes in the bar graph. Which quantities of energy are constantly changing? Why are these energies changing?

Notice that the total energy amount does not change. This total energy is the sum of the kinetic and potential energy.

5. Pause the motion of the skater when he is at the bottom of the curve. Make a sketch of the graph at this point

6. Pause the motion of the skater at some other point of the curve. Make a sketch of the graph at this point

1.  Pause the motion of the skater when he is at the top of the curve. Look at the bar graph. Make a sketch of the graph at this point.

7. What is the name of the rule that governs this transfer of energy?

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**Add friction to the track.**

You can change the amount of friction by adjusting the slider.

8. Add a medium amount of friction and observe the effects of the friction on the skater. Write your observation here:



9. Open a new bar graph. What new column has been added to the graph? Why?

10. Watch the motion of the skater until he comes to a stop. Draw the graph as it looks now. **Explain**.

**Reset**. Hit the reset button at the top.

**Explore gravity.**

11. Find the settings for Location and Gravity on the right side of the screen (above the friction button). What is the numerical value for gravity on earth?

12. Change the location to the moon. What is the numerical value of gravity on the moon?

13. How is the motion of the skater different on the moon than it was on the earth? Why?

14. Change the location to Jupiter. What is the numerical value of gravity on the moon?

15. How is the motion of the skater different on Jupiter than it was on the earth? Why?

16. Change the location to outer space. Since there is no gravity in space, how can you make the skater move?

**Reset.** Hit the reset button at the top.

Explore different tracks. You can change the track by clicking and dragging the circles on the track. At the top left corner of the screen there is a place to get more track.

 Try to create each of the following track arrangements. If it works, write YES. If it does not work, explain why.

17. 18. 19.



20. Design your own track. Draw it here: