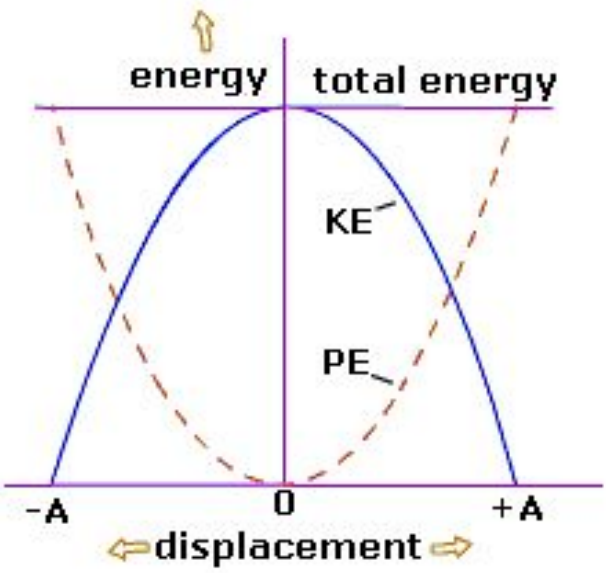
Day 15: **Energy Skate Park Simulation**

Do Now: Describe what you see. What does the graph reveal about potential and kinetic energy? What object do you think is represented?



Objective:

Students will be able to demonstrate an understanding of Conservation of Energy by…

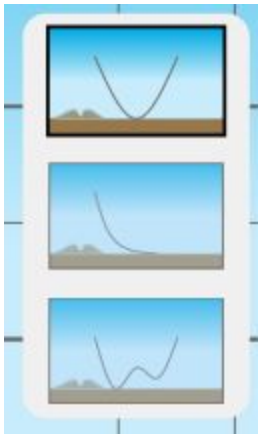
- *Identifying energy present and energy transferred in the case of an object rolling up and down a curved ramp*
- *Drawing LOL Energy Diagrams to represent those energy forms and transfers*

Instructions:

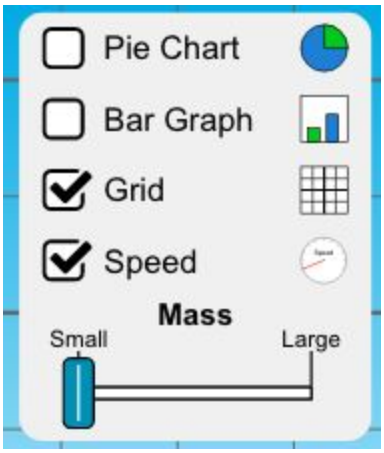
1. Google “Energy Skate Park” and click on this result:

Energy Skate Park: Basics 1.1.5 - PhET
https://phet.colorado.edu/.../energy-skate-park-basics/.../energy-skate-park-basics_en....
Energy Skate Park: **Basics** Intro Friction Playground . **Energy Skate Park**: **Basics** Intro Friction Playground . m.

2. Play with the “intro” section of the simulation several times and observe how the skater moves when you release him from different points along the different ramps. Remember to…
    a. Play with all 3 different ramp shapes:



    b. Check only the following:

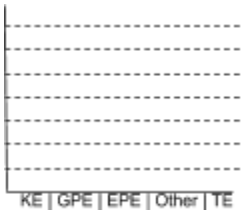
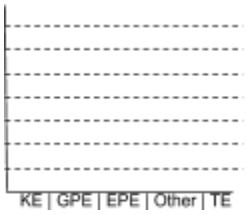


    b. Turn the “Slow Motion” On:

3. Write a general description of how the skater moves on each of the ramp shapes

4. Using what you know about the “Law of Conservation of Energy”, explain why the skater moves in the ways you described in #2

5. Energy tables can be helpful in keeping track of the values for GPE, KE, and all the variables that go into calculating those different types of energy. Return to the first shape:  and release the skater from the very top edge of the ramp. For each point described below…
    a. measure all values you can using the video and add them to the table in BLACK
        i. hint: each tick mark on the speedometer is 1 m/s, but you will have to round for your numbers to make sense.
    b. calculate all energies you can using the values you measured and what you know about GPE, KE, and Total Energy. Add these energy values to the table in BLUE

	Point 1 (Initial max height)	Point 2 (Midway down ramp)	Point 3 (Bottom of ramp)
Height (h)			
Mass (m)	100 kg	100 kg	100 kg
GPE			
Velocity (v)			
KE			
Total/Mechanical Energy			
Energy Bar Graph			

6. What do you notice about the total Mechanical Energy all 3 points? What do these values reveal about energy in the system?

7. Draw a bar representing how much PE, KE and Total Energy is present for each point specified in the table on the previous page.

8. Check the “Bar Graph” and “Pie Chart” options and use them to check your bar graphs in the table above. Make any corrections in a different color.
9. What does the Bar Graph and Pie Chart show about energy in the system?

10. What objects are included in the system that you analyzed above? How do you know?

11. Explore the skater’s motion and energy again, this time selecting the “friction” option. How are your results different? Is energy in the system still conserved? Explain.