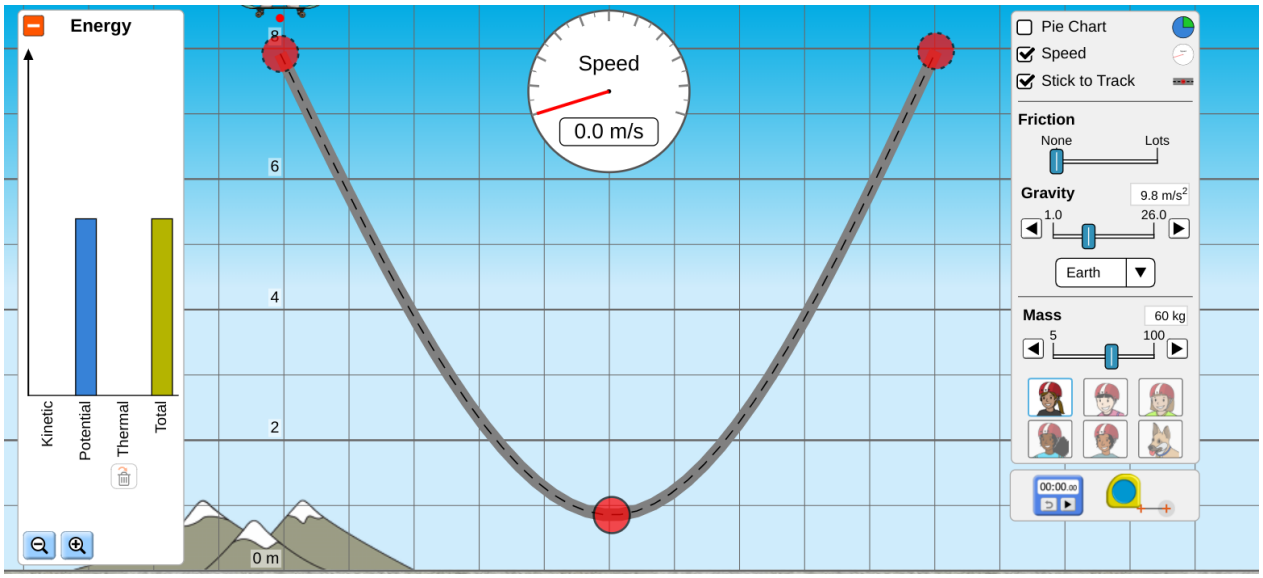
Dr. Duick

308 Energy Skate Park Tables

ACTIVITY 1:

Click the grid feature.
Create a ramp like the one shown that is 8 meter tall. Make sure the ramp is 1 meter above the ground (total drop 7 meters).



Insert the speedometer.

Drop the skater from the top of the ramp so that he reaches the top of the ramp on the other side and comes back again.

4pts) Using the equations PE=mgh and KE= $1/2mv^2$ solve for the following

	PhET Skater 100kg	PhET Skater 75kg	PhET Skater 50kg	DOG 25kg
Maximum potential energy				
Maximum kinetic energy				
Speed of Skater at the bottom				

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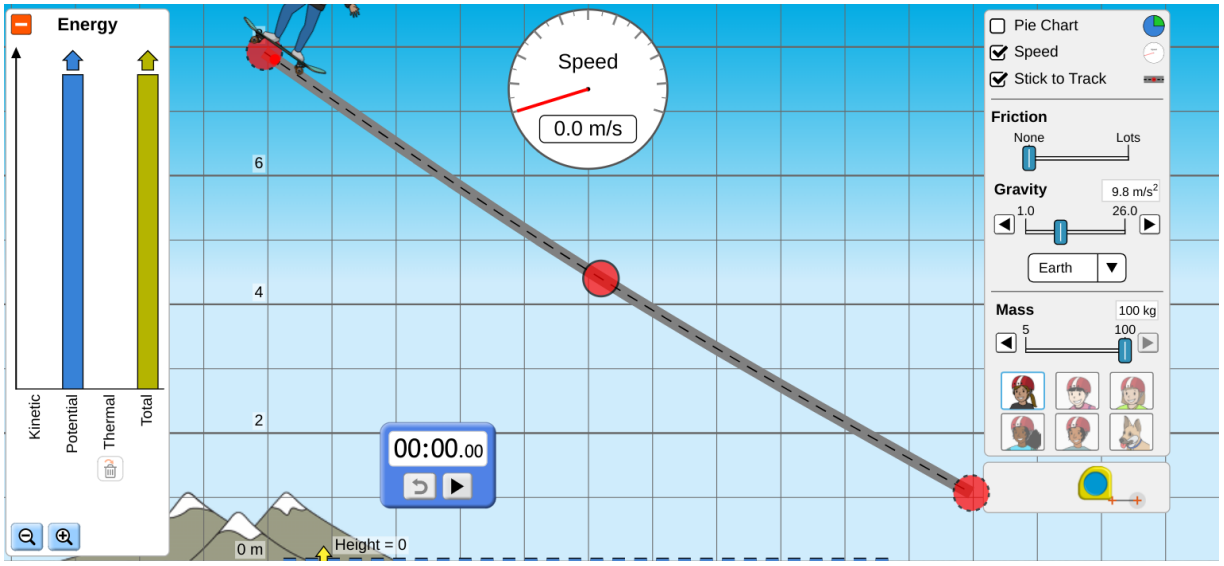
4pts) Solve mathematically for the speed of each skater at the bottom of the curve.

	PhET Skater 100kg	PhET Skater 75kg	PhET Skater 50kg	DOG 25kg
Math solving for Speed of Skater at the bottom				

4pts) Derive (show the steps) a new mathematical equation that indicates why the speed at the bottom of the curve is independent of mass.

ACTIVITY 2:

Set up your ramp so that it looks like the one shown. Skater is 100kg, speedometer is on , and place the timer on the scene.



Drop the skater from each of the dots on the ramp, starting from the top, and complete the table below.

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Dot	**8m**	**6m**	**4m**	**2m**	**1m**
potential energy					
kinetic energy*					
Time					
Speed measured					
Velocity[&] Calculated					

To determine the PE = mgh

*to determine the KE at any interval
subtract the PE (from the lower height) from the starting PE.
EXAMPLE
PE at 10m = mgh = 100kg*9.81m/s^2*10m = 9810j
PE at 7m = mgh = 100kg*9.81m/s^2*7m = 6867j
KE = 2943j

[&]Use KE=1/2mv^2 to solve for velocity at any interval

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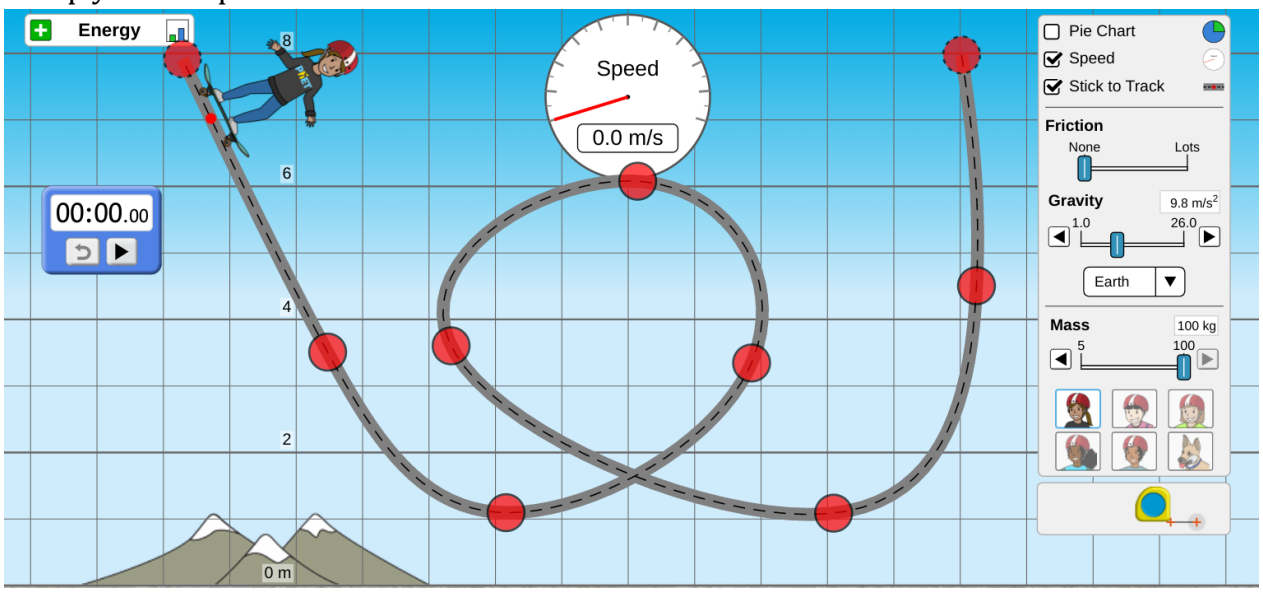
ACTIVITY 3:

Set up your ramp so that it looks like the one shown.



In the table below record the **maximum potential energy** for each of the skaters at the top of the loop. Repeat this on the Moon, and on Jupiter. You will need to place the skater at the top of the ramp each time you change location.

	PhET Skater 100kg	Maximum Velocity	Time to reach top of loop	total time to complete
Earth				
Moon				
Jupiter				