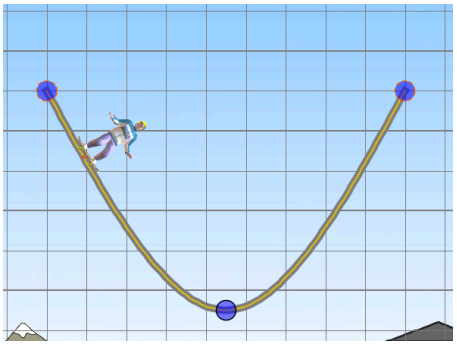
Corona Week 3

1. PhET Energy Skate Park Sim

Part 1: Intro No Heat Losses

Go to PhET Energy Skate Park.
Click on “Intro” Sim
Turn on the Bar Graph and the speed.



1. If he starts from rest at a certain height on one side, how high does he go on the other?

2. Where does he have the most Gravitational PE? Where is he momentarily stopped?

3. Where does he have the most Kinetic Energy? Where is he moving the fastest?

4. What is true of his total energy over time?

5. Increase his mass. Does it change his speed at the bottom?

Part 2: Friction: Heat Losses

Click on the “Friction” Sim at the bottom
Turn on the Bar Graph and the speed.

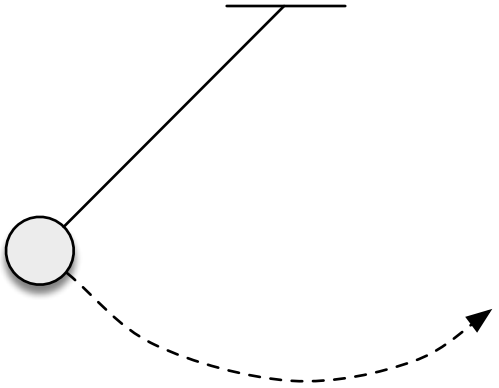
6. Is his total energy still the same over time?

7. Where is his energy ending up over time? Why?

8. GPE and KE trade energy back and forth nicely, nicely. Who doesn’t trade energy back nicely? Explain.

9. There is another way to convert energy to thermal - what is it? (The intro video I posted had a hint in it.)

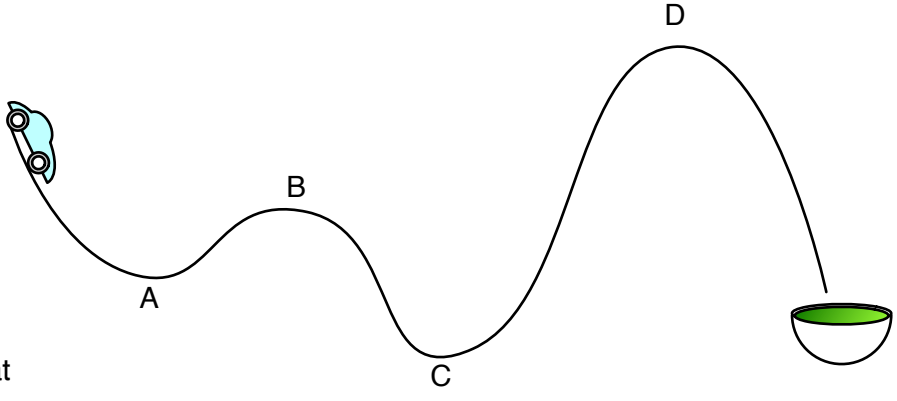
Part 3: Follow-up Questions



1. The pendulum bob is released from rest. Label or state the spots where it has:
   a) The most GPE.
   b) The most KE.
   c) About half GPE and half KE.
   d) The most speed.

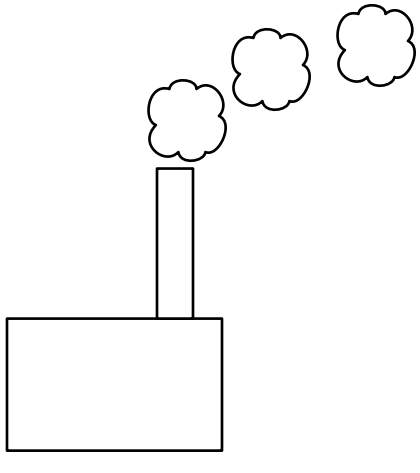
2. Assuming minimal heat losses, about how high would you expect the pendulum to rise on the other side? Why?

3. In reality, the pendulum won't quite make it back up to its original height. Does that mean that energy is not conserved? Explain.



4. If you were to release the Hot Wheel from rest at the position shown on the track (assuming no heat losses)…
   a) At the beginning, what kind of energy does the car have?
   b) What kind(s) of energy will it have at the top of hill B?
   c) At which spot will the Hot Wheel will have the most KE?
   c) Will it land in the bowl of pea soup at the end of the track? Explain.

5. Does the mass of the Hot Wheel affect its speed at the bottom? Two hints: 1) Has mass ever affected the speed of something falling if drag is not an issue? 2) If $mgh = 1/2mv^2$, then the m's cancel out - can m matter if it cancels out?



6. When I turn on lights at my house, where does the energy come from to do that? If you answered, "from the electricity", then how did the electricity get the energy?
Don't worry about details here, just think in general terms of energy conservation. Think about what must be happening back at the power plant.