

Intro to Energy: Skate Park Basics

Name _____ Date _____ Block _____

Pre-Lab:

Kinetic Energy (KE , E_k) – The energy of a _____. No motion, no _____. Depends on _____.

Potential Energy due to gravity (PE_g , E_g , PE_{grav}) - The potential to move based on _____. More height, more _____ energy. No height, no potential _____ energy.

Elastic potential energy (E_{el} , E_{elas}) – The potential to move due to the _____ or compression of a _____ or rubber band. No _____ object, no E_{el} .

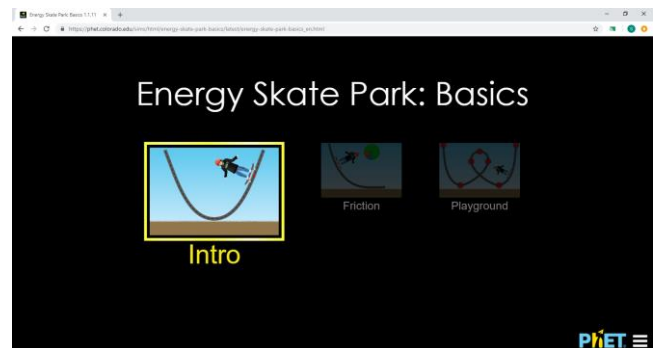
Thermal (heat) energy (E_{Therm} , E_{heat} , E_{int}) – The energy _____ ‘steals’ and turns into _____ or internalized thermal energy. This energy is not able to _____ to potential or kinetic in our models. _____ friction to occur.

PHET ENERGY SKATE PARK BASICS

Link on google classroom or

<http://www.colorado.edu/physics/phet/dev/html/energy-skate-park>

- **Select INTRO**
- Check on “bar graph” “pie graph” and “speed”

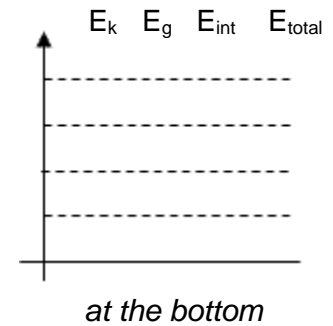
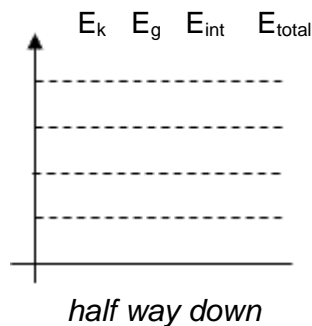
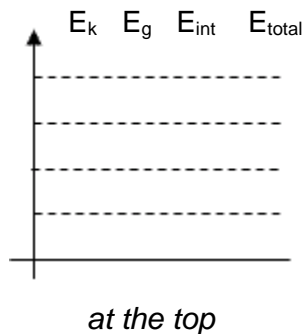


1. Click on the skateboarder and raise them up to the top of the ramp. When you let them go, do they make it to the top of the other side?
2. There is **no elastic energy** in this example. Why do you think it isn't required or included?
3. Originally the skater had no energy of any type at rest on the ground. You picked up the skater giving the skater potential energy and height to start. **What physics term describes what you did to transfer energy to the skater by doing this?**
Hint you pulled the skater up, causing an upward displacement.

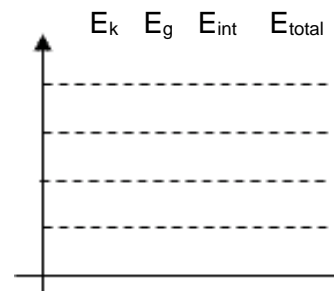
- Play around with the skateboarder or any of the dials or let them move around. WHAT CAN YOU DO TO THE SKATER TO GIVE THEM MORE POTENTIAL ENERGY (E_p)?
- Play around with the skateboarder or any of the dials or let them move around. WHAT CAN YOU DO TO THE SKATER TO GIVE THEM MORE KINETIC ENERGY (E_k)?

Reset, and place your skateboarder on the top of the ramp and let them move.

- Does your **total energy** ever change?
- Look at speed, when the speed dial is the fastest, what energy is the highest?
- Look at speed, when the speed dial is the fastest, what energy is the lowest?
- On the following pages, **DRAW the energy bars** at the different heights described.



- Add Friction.** What happens to your skater?
- What energy appears once friction is added?
- Does the **total energy** change now?
- Draw your bar graph once the skateboard has **stopped moving**.



Kinetic Energy (KE, E_k) – The energy of a moving mass. No motion, no kinetic. Dependent on speed.

Potential Energy due to gravity (PE_g, E_g, PE_{grav}) - The potential to move based on height. More height, more potential energy. No height, no potential gravitational energy.

Elastic potential energy (E_{el}, E_{elas}) – The potential to move due to the stretch or compression of a spring or rubber band. No elastic object, no E_{el} .

Thermal (internal) energy ($E_{Therm}, E_{heat}, E_{int}$) – The energy friction ‘steals’ and turns into heat or internalized thermal energy. This energy is not able to return to potential or kinetic in our models. Requires friction to occur.