

# Adventures in Energy Skate Park

Skateboarding has seen an immense growth in popularity over the last several years. What started as a way for surfers to kill time when the waves were not high enough for surfing has turned into an organized, competitive sport that boasts internationally known athletes and a million dollar industry.



## START THE SIMULATION

- Link in on google classroom: <https://phet.colorado.edu/en/simulation/energy-skate-park-basics>
- Or go to class website: [bbcrawfo.weebly.com](http://bbcrawfo.weebly.com) → Classes → Intro to Physics → Jan

Click the play arrow. Click Intro.

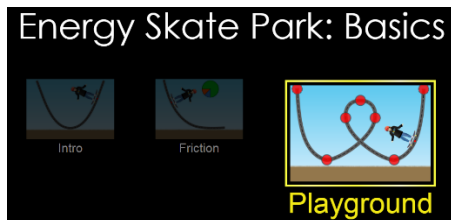
As the skate park opens on your screen, observe the movements of the skater in the half pipe.

1) Click on “**Bar Graph**”. Watch as the skater moves across the track and how it changes the levels of Potential and Kinetic Energy. (You can slow or pause the skater down at the bottom of the simulator window to help you observe).



- When is the **gravitational potential energy** the highest? \_\_\_\_\_ The lowest? \_\_\_\_\_
- When is the **kinetic energy** the highest? \_\_\_\_\_ The lowest? \_\_\_\_\_
- When are the kinetic and gravitational potential energy levels the **same**? \_\_\_\_\_
- What happens to potential energy (PE) as kinetic energy (KE) goes up?
- What happens to **total energy** (yellow)? Why do you think this happens?
- Can you think of a scenario when the kinetic and gravitational potential energy could both be **zero**?  
**Describe** or **draw** how this could be possible below:

For the next questions you will need to use the "Playground" link. It should be at the bottom. Looks like this:



Create a small coaster by clicking and dragging the tracks (on the left with red dots on it) into the middle. Click on the bar graph.

1. Why is there thermal energy? EXPLAIN.
2. What happens to thermal energy as he keeps skating? EXPLAIN.

### **PART B: CREATING A SKATE PARK**

1. Thanks to your great skateboarding skills, city officials have asked you to add your expertise with designing a new skate park. Experiment with the different tracks that are available under the tracks icon at the top of the page and build your idea of the perfect track. Draw your track below. If your first track did not work (skater got stuck or fell off), design another track and explain why your first idea didn't work.

**How can you use what you know about kinetic and potential energy to help you with your designs?**

2. What affects the relationship between potential and kinetic energy?

Can you get a skater do two loops?

Can you get the skater go airborne, but land on another track?