

Non-obvious controls:

- Use the **Save** feature in the **File** menu to save a track and Skater position for lecture or homework. Use **Open** in the **File** menu, to open the track.
- You can resize the windows when you open the graphs and charts to make them fit.
- **Return Character** or **Bring Back the Skater** (*name changes with the character*) buttons do the same thing. The Skater is returned to the place where the user last placed it.
- You can **Pause** the sim and then put the Skater wherever you like easily. Then the **Return Character** (or **Bring Back the ..**) will let you rerun the scenario.
- The **Energy Position Graph** has a few subtle features. It erases as the sim Plays, but you can **Pause** the simulation and the graph will not change. The **Copy** button will let you freeze the graph to compare different scenarios, but it cannot be saved as a file. If you **Zoom**, the graph clears; you can make a new graph by rerunning your scenario using **Return Character**.
- If you use the **Show Path** feature, you can click on the purple dots and show quantitative information. Height refers to height from Potential Energy Reference line. Click again to hide.
- **Step** is a good way to incrementally analyze. It is very useful to have the students make predictions. The button next to **Play** in the large window moves the character forward in time. The button in the **Energy Time** window moves the vertical cursor on the graph (Steps through the Playback).
- If you are doing a lecture demonstration, you should set your screen resolution to 1024x768 so the simulation will fill the screen and be seen easily.

Important modeling notes / simplifications:

- When the Skater lands on the track, the vertical component of his kinetic energy is converted to thermal energy. You can do experiments where there is no energy loss to thermal (only PE and KE conversions) by making sure he doesn't leave the track. (No jumps or use the roller coaster mode).

Insights into student use / thinking:

- If the students open too many windows, they have a difficult time focusing on learning and tend to just play with the Skater.

Suggestions for sim use:

- For tips on using PhET sims with your students see: [Guidelines for Inquiry Contributions](#) and [Using PhET Sims](#)
- The simulations have been used successfully with homework, lectures, in-class activities, or lab activities. Use them for introduction to concepts, learning new concepts, reinforcement of concepts, as visual aids for interactive demonstrations, or with in-class clicker questions. To read more, see [Teaching Physics using PhET Simulations](#)
- For activities and lesson plans written by the PhET team and other teachers, see: [Teacher Ideas & Activities](#)

