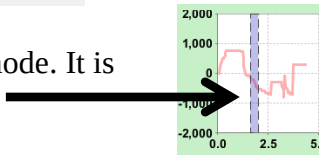
PhET Tips for Teachers **The Ramp Simulation**

There is a revised version based on our research called Ramp-Force and Motion

Tips for controls:

- Use the controls on the bottom to **Pause, Step**, or **Playback** the motion.

- The vertical grey line in the graphs is grabbable in **Playback** mode. It is useful to relate the object's motion to the graphs.



Important modeling notes / simplifications:

- Thermal Energy - the surface will heat up due to work done by friction. The friction coefficients *do not change* when the surface heats up.
- Using the "Clear Heat" button will remove the thermal energy. While the surface is wet (blue) the coefficients of friction are lowered until the surface is dry again (brown).
- If you want to explore how friction coefficient and mass effect friction forces, use the Friction Tab in the sim Force and Motion

Insights into student use / thinking:

- **This sim had many problems, so we revised it; the new sim is** Ramp-Force and Motion.

Suggestions for sim use:

- We designed the motion sims to be used in the following order: Moving Man, Forces & Motion, then Ramp-Force and Motion. (The sim called "The Ramp" is an older version, but contains energy graphs. We plan to write an energy sim to reach the learning goals)
- Two related sims are Ladybug Revolution and Ladybug Motion 2D
- 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**

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