**Non-obvious controls:**

* You can type in a value for the **battery voltage** or use the arrows to change it.
* If you are doing a lecture demonstration, set your screen resolution to 1024x768 so the simulation will fill the screen and be seen easily.

**Insights into student use / thinking:**

* Students may think that electrons in a circuit are created by the voltage. This sim helps them see that electrons are always in the circuit and the voltage just makes them move.
* Some students may think that the energy diagram represents a physical object rather than a graph, so you may need to explicitly point out that this is not the case.

**Suggestions for sim use:**

* For tips on using PhET sims with your students see: [**Guidelines for Inquiry Contributions**](http://phet.colorado.edu/teacher_ideas/contribution-guidelines.php)and [**Using PhET Sims**](http://phet.colorado.edu/teacher_ideas/classroom-use.php)
* 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**](http://phet.colorado.edu/phet-dist/publications/Teaching_physics_using_PhET_TPT.pdf)
* For activities and lesson plans written by the PhET team and other teachers, see: [**Teacher Ideas & Activities**](http://phet.colorado.edu/teacher_ideas/index.php)
* Use this sim to illustrate how distribution of energy levels in a material cause it to conduct or not.