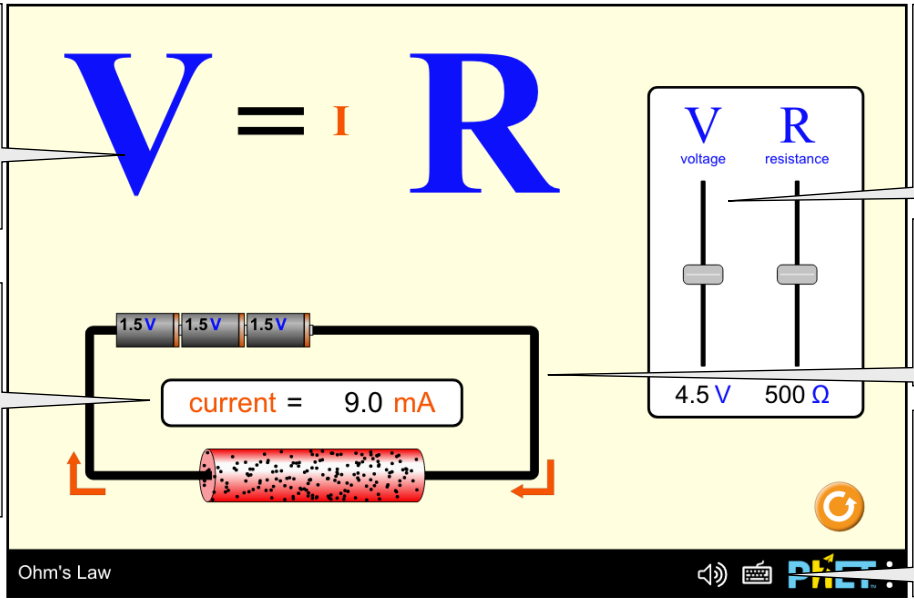
PhET Tips for Teachers

Ohm's Law

In **Ohm's Law**, students explore how changing the voltage (V) or resistance (R) influences current (I) in a circuit.

OBSERVE how the size of the variable changes when the value changes.

MEASURE the current in the circuit for a given voltage and resistance.



CHANGE the voltage or resistance of the circuit.

TRACK changes in the circuit as V and R are varied.

ACCESS sim features (sound on/off, keyboard shortcuts)

Model Simplifications

- The black dots in the wire represent impurities in the metal lattice. Materials with a high density of impurities have a higher probability of collisions between the electrons and the cations in the lattice, which results in a higher resistivity.
- Because the length and area of the resistor is unchanged, the resistance slider controls the resistivity of the material.

Additional Features

- The pitch of the slider notes is proportional to the size of the current in the circuit and not dependent on specific slider positions. Try to achieve the same note (same current) with different slider positions.
- See the Sound Features Video for more useful tips on how concepts and sound are integrated in this sim. See the published Sound Design Documentation for more details on all sounds in this simulation.

Suggestions for Use

Sample Challenge Prompts

- Describe what happens to the current in a circuit when the voltage is increased. What happens when the resistance is decreased?
- Does changing the voltage of the circuit cause a change in the resistance? Why or why not?
- Explain why current and resistance are inversely proportional.

See all published activities for Ohm's Law here.
For more tips on using PhET sims with your students, see Tips for Using PhET.

Hanson, Rouinfar, and Fiedler, April 2021