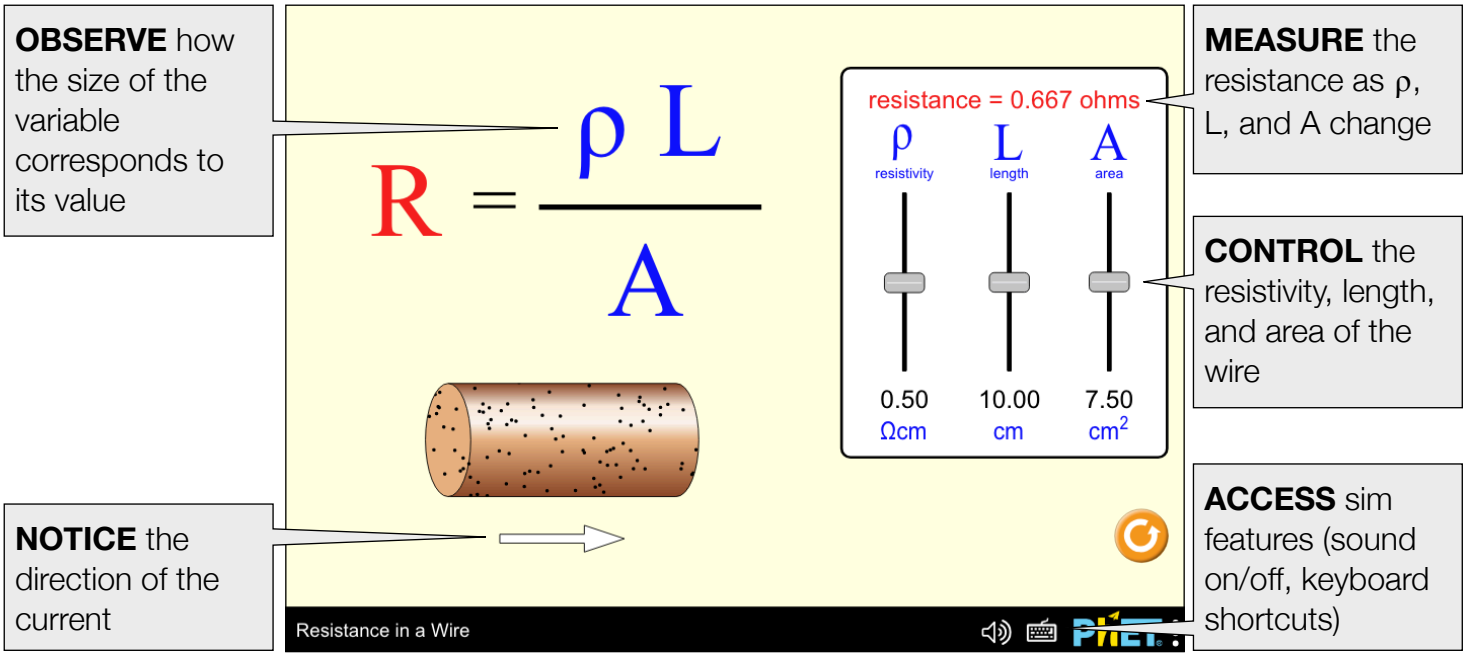
PhET Tips for Teachers

# Resistance in a Wire

In **Resistance in a Wire**, students explore how changing the resistivity (ρ), length (L), and area (A) of a wire affects its resistance (R).




## Accessibility Features

Description  Alternative Input  Sound

## 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 collision between the electrons and the cations in the lattice, which results in a larger resistivity.

## Sound Features

- The pitch of the slider notes is proportional to the size of the resistance in the wire and not on specific slider positions. As a challenge: try to achieve the same note (same resistance) with different slider positions.
- See the Sound Features Video for more useful tips on how concepts and sound are integrated in this sim. For additional details on all sounds used in this simulation, see the published Sound Design Documentation.

## Suggestions for Use

### Sample Challenge Prompts

- What variables affect the resistance in the wire? How can you maximize/minimize the resistance in the wire?
- If the area of a wire is doubled, how does its resistance change? Explain.
- How does the resistivity relate to the resistance? Can the resistivity of a material be changed?
- Describe what happens to the flow of electrons when the wire becomes (a) longer or (b) thinner.

See all published activities for Resistance in a Wire here.
For more tips on using PhET sims with your students, see Tips for Using PhET.