

In **John Travoltage** students explore concepts of static electricity including transfer of charge, repulsion, and grounding.

DRAG John's foot across the carpet to accumulate static electricity

MOVE John's finger closer to the door knob to discharge

ACCESS sim controls (sound on/off, keyboard shortcuts) or add features (extra sounds, voicing)

John Travoltage

Model Simplifications

- The electrons are represented in a macroscopic view, and each depicted electron represents billions of negative charges in the underlying model.
- John can get a shock from the door knob at a distance much larger than is typically possible. This demonstrates that a larger charge is needed to cause the dielectric breakdown of air at larger distances from the door knob.
- For visualization purposes, the discharge time has been made longer than in reality.
- Due to the long discharge time depicted in the simulation, a continuous discharge is possible if John's foot is continually rubbed against the carpet. This feature is useful for explaining devices such as a Van de Graaff generator.

Suggestions for Use

Sample Challenge Prompts

- Predict what will happen to John if he drags his foot on the carpet. What happens when his finger gets close to the door knob?
- Observe discharges with John's arm in several different positions. Explain how arm location and charge accumulation affect discharge.
- How do charging and discharging compare? How charging can go unnoticed, but discharging is often accompanied by a shock? Explain.
- Try building up charges while John's finger is touching the doorknob. Explain your observations.
- Compare John Travoltage to [Balloons and Static Electricity](#). How does bringing a charged a balloon close to the wall compare to rubbing John's foot on the carpet and bringing his finger close to the door knob? How do these situations differ?

Inclusive Features

Sound and Sonification

- Extra attention can be drawn to the charge transfer step by enabling Extra Sounds in the Audio tab of the Preferences menu. Electrons *pop* into John's foot with increasing pitch as charge builds up in his body and out of John's finger during discharge.
- Electrons *hum* with increasing volume as charge builds up in John's body.
- 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.

Interactive Description

- This simulation features interactive description to support non-visual access, delivered only while using screen reader software. See the [Introduction to Interactive Description video](#) for more info on how to use this feature.
- Teachers can [access the A11y View here](#) to decide if this sim's interactive description meets their instructional needs. *Reminder: A11y View is not intended for student use and will not provide a good experience for learners using screen reader software.*

See the simulation page for all supported inclusive features.

See all published activities for John Travoltage [here](#).

For more tips on using PhET sims with your students, see [Tips for Using PhET](#).