

## Lesson plan for [Capacitor Lab](http://phet.colorado.edu): Inquiry into Capacitor Design <http://phet.colorado.edu>

### **Learning Goals:**

Students will be able to:

- Identify the variables that affect the capacitance and how each affects the capacitance.
- Determine the relationships between charge, voltage, and stored energy for a capacitor.
- Relate the design of the capacitor system to its ability to store energy.

Learning Goals for Capacitor Lab Advanced Activity: (I have not written an activity for these goals yet, because they are not part of my course. These learning goals would be addressed using the third tab: *Multiple Capacitors* and perhaps the PhET [Circuit Construction Kit AC-DC](#))

- Determine the equivalent capacitance of a set of capacitors in series and in parallel in a circuit.
- Determine the energy stored in a set of capacitors in a circuit.
- Explore how varying the amount of dielectric material inserted between the conductors affects the function of the capacitor.
- Explain how a capacitor or set of capacitors would be used in a real world application.

### **Background:**

My students will have completed a unit on static electricity and magnetism:

[http://jeffcoweb.jeffco.k12.co.us/high/evergreen/science/loeblein/phys\\_syl/Sem2Unit3.html](http://jeffcoweb.jeffco.k12.co.us/high/evergreen/science/loeblein/phys_syl/Sem2Unit3.html).

Capacitance is a small learning goal for Electricity unit, so I plan to assign this activity as homework after an introductory lecture.

### [Capacitor Lab](#) **Introduction:**

This seems to be a very easy sim to allow students to explore without directions. There are no Tips for Teachers for this sim as of August 2011.

**Lesson:** Students will do this for homework.

**Post-Lesson:** At this time, I have not written clicker questions, but I think this is a good sim for probing students' concepts with clickers.

**Follow-up sims:** [Circuit Construction Kit AC-DC](#) has capacitors that students can use in circuits with other circuit components.