

MiniLab – Homemade Capacitor!

1. Use two pieces of aluminum foil separated by a piece of paper to form a capacitor on top of a table. A board or books can be helpful to hold the layers tight together. The two layers of foil **MUST** be insulated from one another by the paper (cannot touch!)
2. Attach the multimeter and measure the capacitance – plug into COM and CxF and switch to nF (see pictures). NOTE: There **must be nothing else attached** to the multimeter when it is in this mode of operation. Calculate the expected capacitance based on measurements and compare to the value indicated by the multimeter.
3. Now change the meter to measure the voltage of the capacitor – plug into COM and V and switch to V (see pictures). NOTE: you **must change where the wire is plugged in!**
4. Connect the 3 V battery with a switch to allow you to charge up the capacitor and then disconnect the battery. When you disconnect the battery the capacitor is still connected to the voltmeter and it will discharge through the resistance of the meter. The resistance of the multimeter acting as a voltmeter is approximately 11 M Ω . Note: with the battery connected press the Range button on the meter once – this will cause it to hold on the present range of voltages, which is helpful for monitoring the changes in voltage.
5. Use a stopwatch to time the discharge of your homemade capacitor. The time to completely discharge is approximately 5RC. Or the half-life time is about 2/3 RC. Use the time you measure and the resistance of the voltmeter to estimate the capacitance. How close is this to the previously determined values?

bottom layer
of foil

paper layer

top layer
of foil





