

## Charging a capacitor

Using the VELA as a digital voltmeter, the charge curve of a capacitor can be captured by creating a simple circuit with a handful of components and using the VELA to measure the voltage across the two legs of the capacitor.

When the switch is closed, the voltage increases slowly over time rather than suddenly as would be the case when measuring the voltage across the resistor.

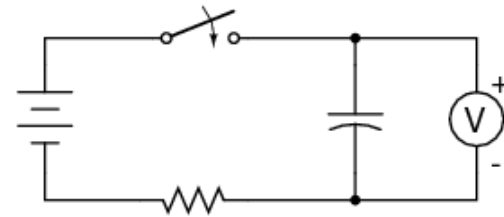
### **Using VELA for more advanced monitoring**

The circuit to the right is a simple resistor-capacitor circuit and as the capacitor charges, across the resistor reduces and the charge rate becomes progressively slower.

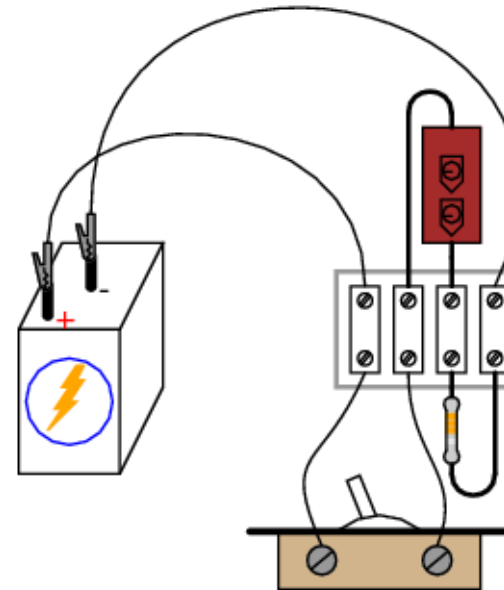
In addition to monitoring the charge across the capacitor, by using the VELA to monitor different points in the circuit, both the voltage drop across the resistor and the charge held by the capacitor can be logged simultaneously illustrating the electrical properties of the circuit as the capacitor charges.

### **For advanced capacitance experiments**

VELA can be used to monitor the charging properties of capacitors in both serial and parallel configurations giving students an interactive, graphical representation of the science at work.



Charging circuit



Charging circuit

## Discharging a capacitor

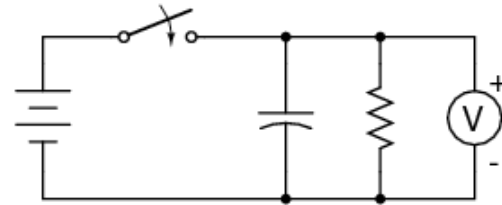
Using the VELA as a digital voltmeter, the discharge curve of a capacitor can be captured by creating a simple circuit with a handful of components and using the VELA to measure the voltage across the load resistor.

In the circuit to the right, when the switch is closed, the capacitor charges immediately and then when the switch is opened, it discharges slowly over time.

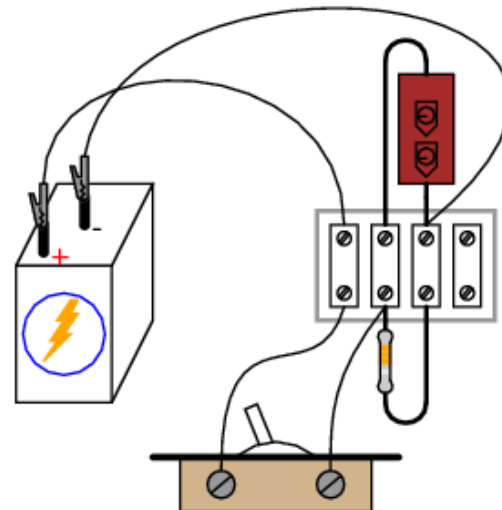
### **For advanced capacitance experiments**

To allow students to better understand the properties of a capacitor, they can modify the circuit by changing the combinations of resistors and capacitors, capturing different discharge curves and comparing them against one another.

Altering the components in this way allows students to explore the concept of the “time constant” of a circuit and how varying the ratings of the components in the circuit affects the time constant.



Discharging circuit



Discharging circuit