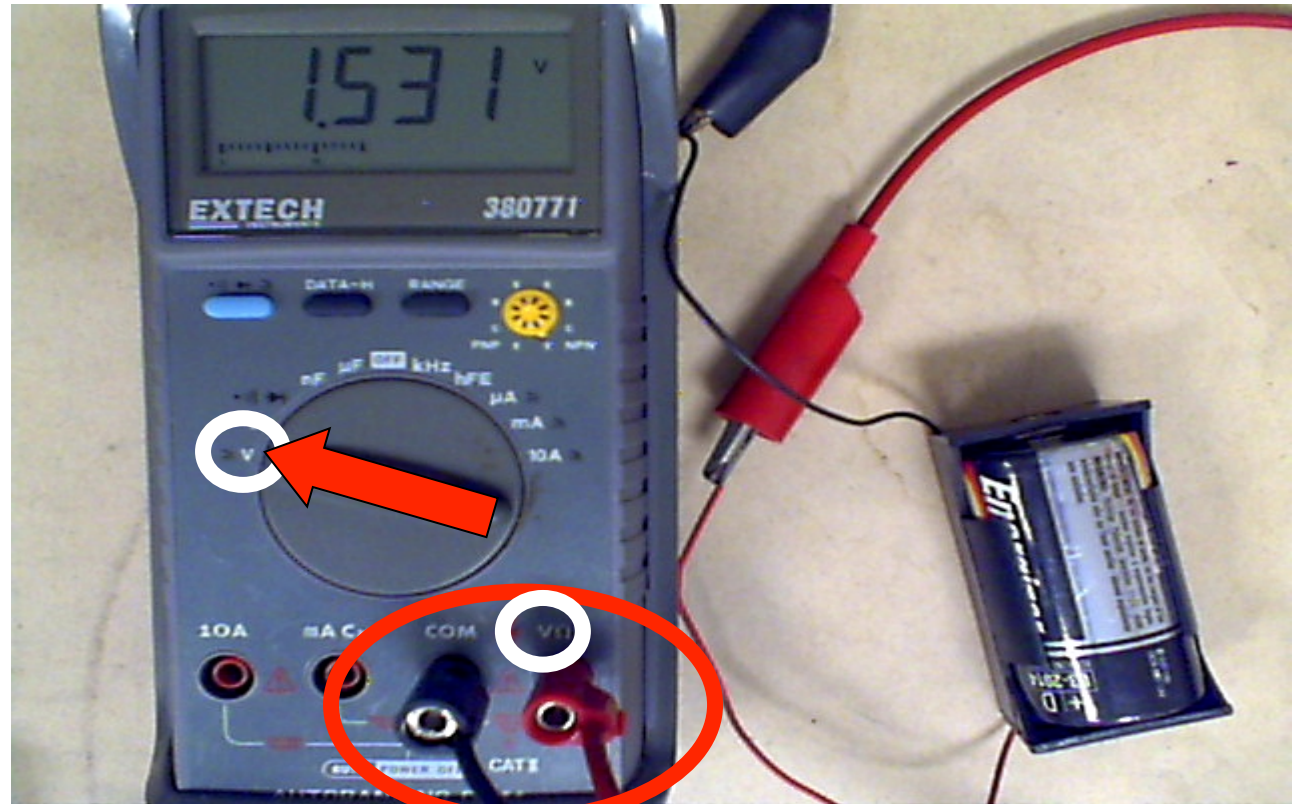


Mini-Lab: EMF and Internal Resistance

1. Goal: Determine the emf and internal resistance of the battery using only voltmeter and circuit board.
2. Adjust the multimeter so that it is measuring voltage (acting as a voltmeter).
3. Connect the voltmeter to the terminals of the 3 V battery – binding posts 1 and 35.
4. Connect an external resistance of some amount and record the resulting measured voltage at the terminals.
5. Use external resistances of the following amounts:
 $R = 22 \text{ k}\Omega, 119 \text{ }\Omega, 68 \text{ }\Omega, 51 \text{ }\Omega, 35.5 \text{ }\Omega, 20 \text{ }\Omega, 10 \text{ }\Omega.$
6. Use *all* of your data to find best values for *emf* and *r*.
7. Challenge: How can a linear graph be created and used?

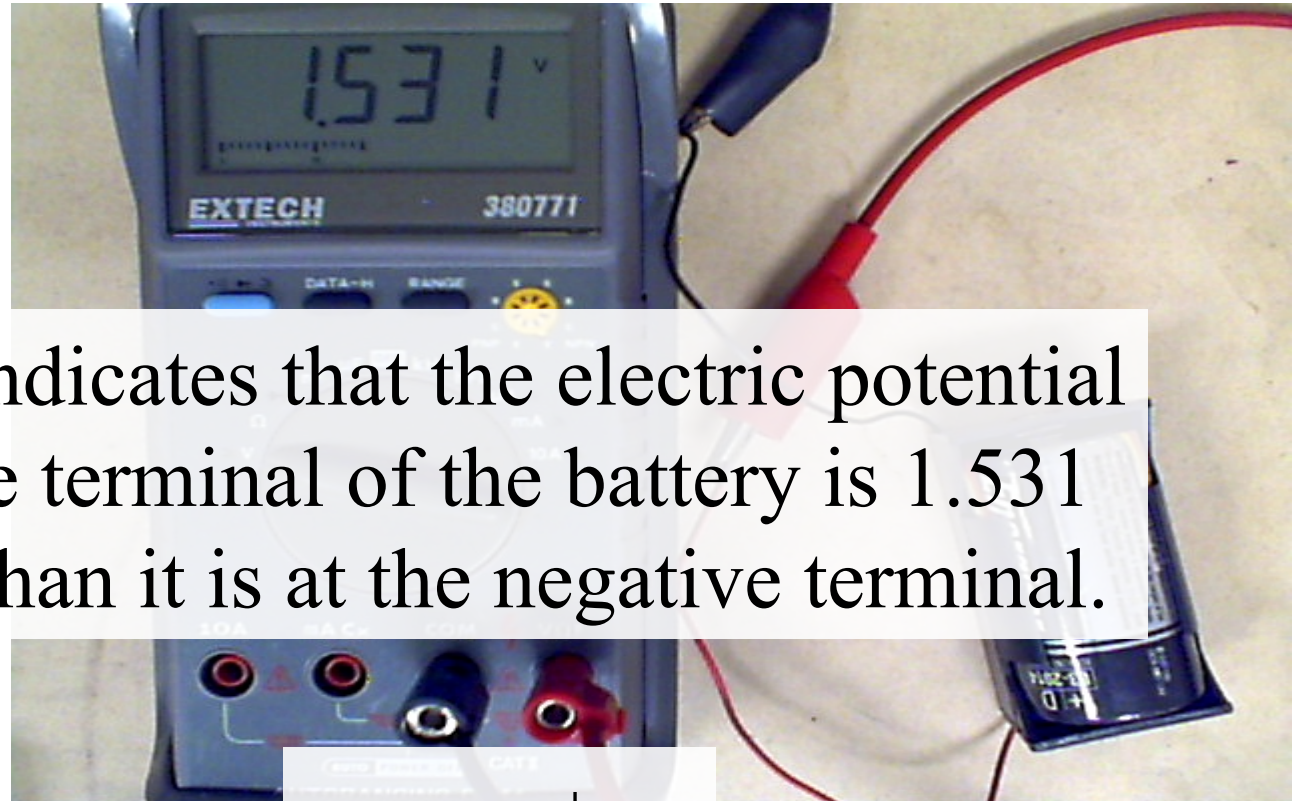
Using the multimeter as a voltmeter:

Selector dial must be set for voltage



Leads must connect to these two terminals
(COM is common to all measurements made)

Using the multimeter as a voltmeter:

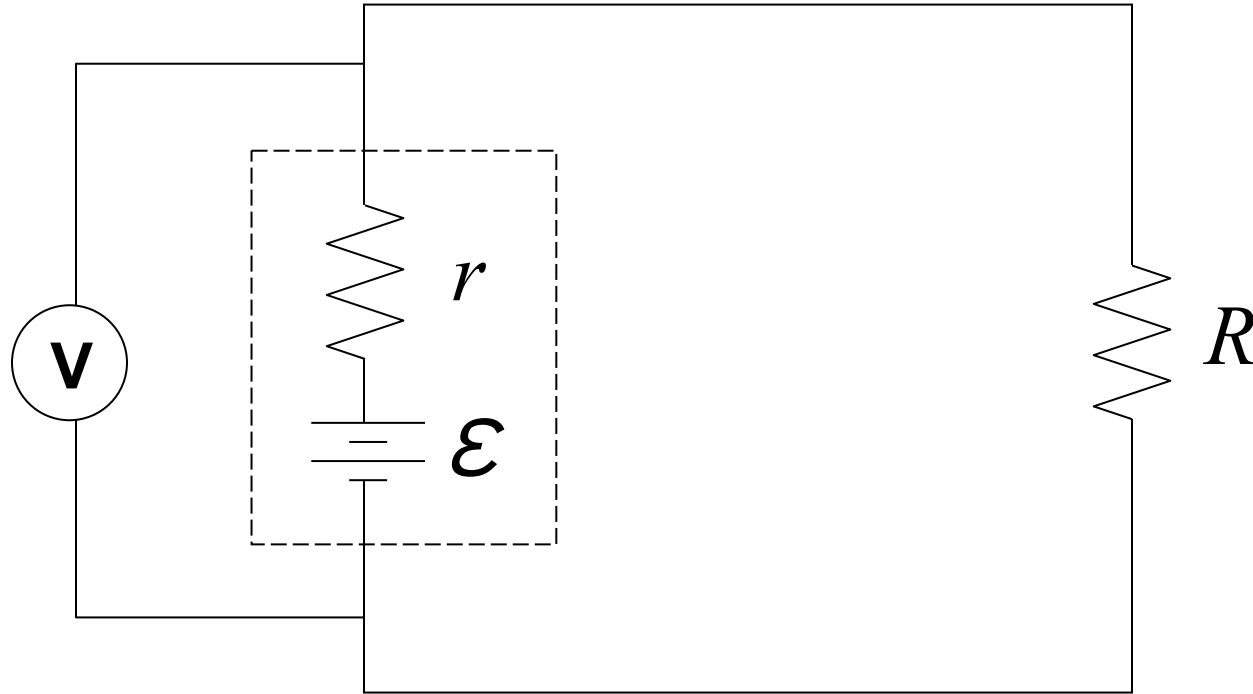


This reading indicates that the electric potential at the positive terminal of the battery is 1.531 volts greater than it is at the negative terminal.

— +

1.531 V

Measure the terminal voltage of the battery.



Vary the external resistance R and note the resulting voltage V ; record both values.

