

# Measuring Voltage and Current

## Apparatus

voltmeter, ammeter, simple circuit with resistor and power supply

## Action

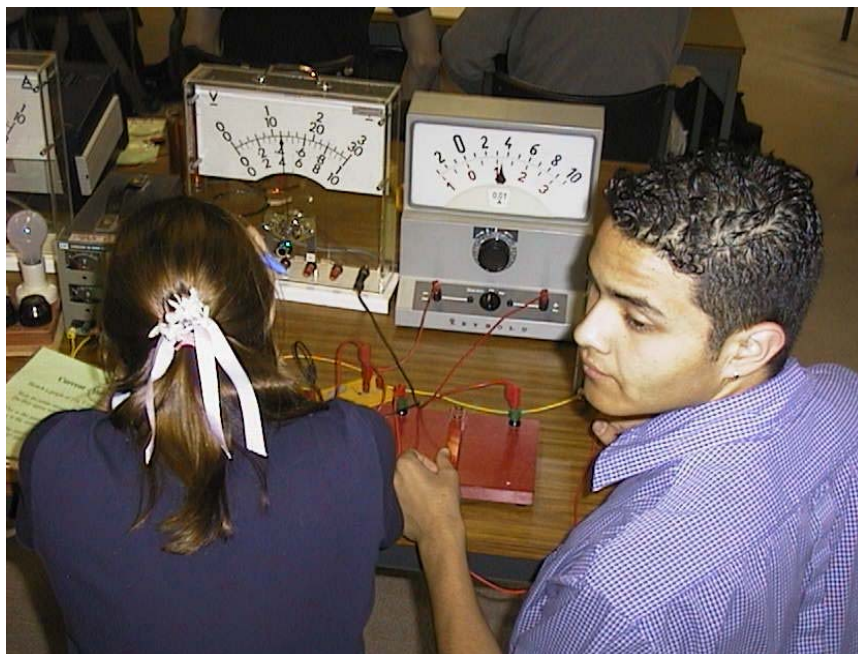
The students can either set up the circuit to measure current and voltage, or the circuit can be set up for them in advance. The students connect up the voltmeter and ammeter to measure the current through the circuit and the voltage across the resistor, or observe and explain why they are set up the way they are.

## The Physics

The ammeter measures the current, which is the number of charges per unit time passing through a given point on the circuit. To be able to count the charges, the ammeter must be part of the circuit hence it is connected in series. It must have a very low internal resistance so that it does not affect the current through the circuit.

The voltmeter is connected in parallel with the component, because it measures the difference in potential between two points i.e. the two sides of the component. It has a very high internal resistance so that very little current will flow through it, thus having little effect on the circuit.

Students at the University of Sydney attempting to measure voltage and current.



## Accompanying sheet

### Measuring Voltage and Current

Examine the simple circuit set up to measure current and voltage.

Why is the voltmeter connected in parallel with the resistor?

Why is the current meter connected up in series with the resistor.

Current meters have very low internal resistance.

Why do you think this is important?

Would you expect the voltmeter to have a high or low resistance? Why?