

Current- Voltage Characteristics

Apparatus

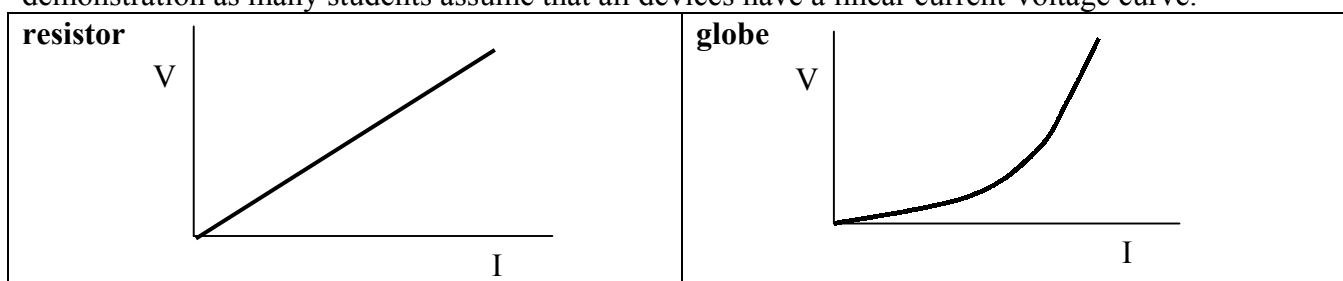
low voltage variable power supply, voltmeter, ammeter, resistor, low voltage globe

Action

The students measure current through and voltage across the resistor and then the globe for several voltages of the power supply. They should sketch the current as a function of voltage for both the globe and the resistor.

The Physics

The temperature of the filament in the globe increases very quickly as the current increases. The resistance increases with temperature, hence the I-V plot for the globe is curved. This is a useful demonstration as many students assume that all devices have a linear current-voltage curve.



Students at the University of Sydney measuring the current voltage characteristics of a resistor and a light globe.



Accompanying sheet

Current – Voltage Characteristics

Measure current through and voltage across the resistor for different voltages.

Repeat these measurements for the globe.

Sketch a graph of I vs V for a resistor and a globe.

What do you notice about the I-V characteristics of the resistor and the globe?
How are they different?