# Lesson Element

# Experiment: Internal Resistance of Cells

The idea that cells are no longer useful as soon as they cannot supply enough energy for a specific device can be explained by investigating the change in internal resistance of cells.

To investigate the internal resistance of cells, a wide range of cells can be used: standard cells and lithium ion cells, also different makes can be compared. You will also need a voltmeter (or multimeter); connecting wires; cell holder; bulb or other simple device to act as a load. Include an ammeter if you wish to calculate the internal resistance.

### Experiment:

* Measure the voltage across the cell with nothing else connected (e.m.f.)
* Measure the voltage connected to a load (p.d.)
* A second load can be used with a different resistance
* Write down the difference in the two values.

### Task

1. Compare new and old cells of the same type.  *The difference will increase as the cell is used for longer.*
2. Compare different composition of the cells. *The ones called ‘rechargeable cells’ will usually have a lower e.m.f.; also they have a different composition depending on need.*
3. Measuring the current and using the equation shown in standard text books, the internal resistance can be calculated for each type of cell.
4. As an extension, a solar cell could be tested or a wind up cell used as emergency sources for phones.