

## Types of batteries used in measuring devices

I use batteries to supply the electrical energy needed by measuring devices.

### Types of batteries in terms of design and internal construction:

- Disposable batteries (non-rechargeable)



(non-rechargeable)

- Rechargeable batteries



(rechargeable)

### Types of non-rechargeable batteries:



Alkaline batteries



Lithium batteries

Zinc carbon batteries

### Sizing batteries



## Types of rechargeable batteries



## Energy capacity of batteries

The capacity of a battery refers to the amount of electrical energy stored in the battery and is often expressed in terms of ampere-hours (Ah) or m-ampere hours (mAh).

The capacity of a battery = Current through the battery  $\times$  Flow time in hours

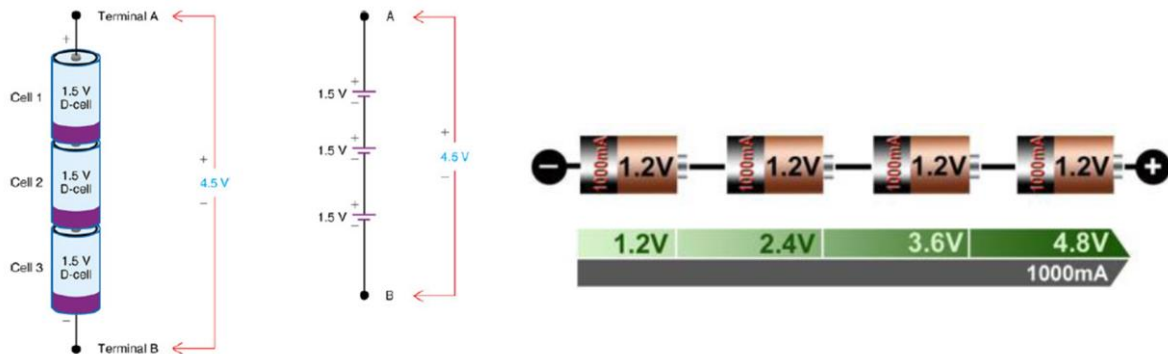
$$C = I \times t$$

A yellow Ni-Cd battery is shown on the left. A green arrow points from the battery to the following calculation:

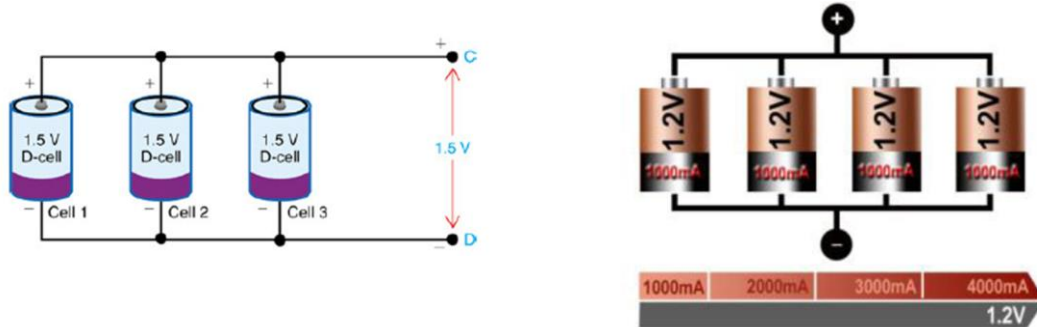
$$t = \frac{C}{I} = \frac{1200mAh}{100mA} = 12h$$

## Battery connections:

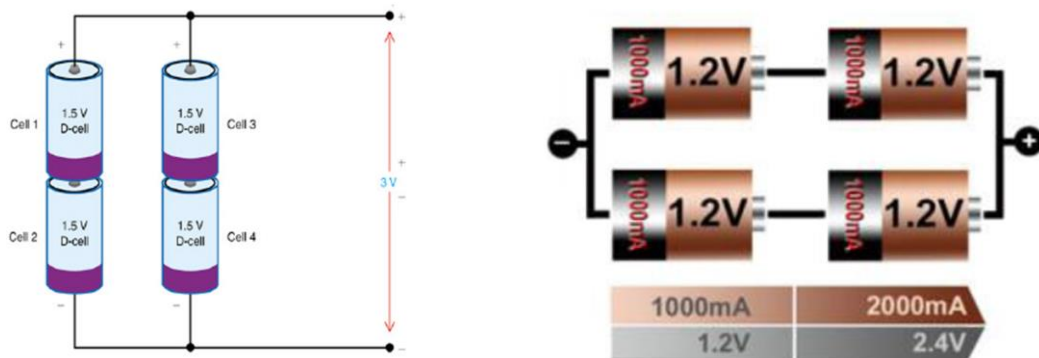
- Series connection: in order to increase the voltage of the batteries, they are connected in series. (In this connection, the capacity of electric energy is constant)



- Parallel connection: in order to increase the current capacity and electric energy of the batteries, we connect them in parallel with each other. (In this connection, the voltage is constant)



- Series-parallel connection: In order to increase the voltage, current capacity and electrical energy of the batteries, we connect them together in series-parallel.



Always be careful when connecting the batteries

- Battery voltage and electric energy capacity should be equal to each other

Important points regarding the battery of measuring devices that cause errors

- Decreasing battery voltage

- Failure to choose the correct size, voltage, and capacity of the electric energy of the battery