

Rules for Circuits

Current

- Series
- Current is the same everywhere.
- If an identical cell is placed in series with the original cell the current doubles because the total voltage of the circuit doubles.
- However, two cells together provide electricity for only the same amount of time as one cell before they both run out.
- Current in a Parallel Circuit.
- In a parallel circuit depends on the resistance of the branch.
- The total current flowing in to the branches is equal to the total current flowing out of the branches.

Voltage.

- Series
- The voltage for each component depends on its resistance.
- The voltage across all of the components adds up to the supply voltage from the cell.
- In energy terms, the work done by the cell on each coulomb of charge equals the work done on the components of the circuit.
- The supply voltage is shared between the components.
- If there is a change in the resistance of one component then the voltage across all of the components will change.
- Parallel
- The voltage is the same for all branches.
- The voltage for each branch is the same as the supply voltage.

Resistance.

- Series
- Calculate the total resistance of a series circuit by adding up the resistance of each component.
- Parallel
- The total resistance of a parallel circuit is calculated using the formula
- $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \dots$