

## OBJECTIVES ELECTRIC CIRCUITS

Topic	Objectives
Circuit diagrams	<p>Recognise and draw symbols for voltage supply, switch, light bulb, resistor, meter, capacitor and diode</p> <p>Draw schematic diagram including series and parallel wiring</p>
Current	<p>Define electric current in words</p> <p>Units ampere and Ah.</p>
Power	<p>Calculate the power dissipated in an electric circuit or in a single resistor</p> <p>Know examples for the effects of electric current (especially heat and light) and their inversion</p> <p>A consumer load does not consume the current, but it transforms electric energy into another energy form!</p>
Resistance	<p>Resistance of a general consumer load is not constant</p> <p>Read values from a current vs. voltage characteristic</p> <p>Graphically determine the current in a circuit with the characteristic and a load line</p>
Resistance of wires	<p>Calculate the resistance of a wire from length, diameter and resistivity (FoTa T 177)</p> <p>Calculate the temperature of a wire from its resistance and temperature coefficient (FoTa T 177)</p>
Resistors	<p>The resistance of a linear resistor is independent of the current</p> <p>Describe two different types of resistors</p> <p>Calculations with Ohm's law (valid only for linear resistors)</p> <p>Calculate the equivalent resistance for a combination of resistors (series and parallel wiring)</p> <p>Calculate partial voltages and partial currents in a circuit</p> <p>Describe how the range of a voltmeter or ammeter can be changed</p> <p>Connect voltmeter and ammeter correctly to a circuit</p> <p>Describe how a meter influences the current in a circuit and what the conditions for an ideal meter are</p> <p>Draw the equivalent circuit for a battery</p> <p>Calculate the terminal voltage from the battery's emf, its internal resistance and the load resistance</p>
Constant	Value
Household voltage (Europe/USA)	$V = 230 \text{ V}/110 \text{ V}, f = 50 \text{ Hz}/60 \text{ Hz}$
Resistance of a 100 m long copper wire with cross section $1 \text{ mm}^2$	$R = 1.7 \Omega$
Property	Table
Properties of conductors (resistivity, temperature coefficient)	FoTa T 177