

# Electricity

## Compact System

### **Basic circuits, conductors & non-conductors**

ELC 01.01	The electrical circuit
ELC 01.02 *	Double-throw switch
ELC 01.03 *	Two-way switch
ELC 01.04	Voltage
ELC 01.05	Serial connection of voltage sources
ELC 01.06	Parallel connection of voltage sources
ELC 01.07	Terminal voltage – Idle voltage
ELC 01.11	Amperage
ELC 01.12	Conductors and non-conductors - solids
ELC 01.13	Conductors and non-conductors - liquids
ELC 01.14	Is the human body an electrical conductor?
ELC 01.15	Is the human body an electrical conductor in contact with water?
ELC 01.16	Closing a circuit by grounding

### **Electrical Resistance**

ELC 02.01	Ohm's law
ELC 02.02	Application of Ohm's law
ELC 02.03 *	Measuring resistance with an Ohmmeter
ELC 02.04	Is the resistance of a wire depending on its length and its diameter?
ELC 02.05 *	Is the resistance of a wire depending on its material and temperature?
ELC 02.06	Is an incandescent lamp an ohmic resistor?
ELC 02.07	Serial connection of incandescent lamps
ELC 02.08	Serial connection of ohmic resistors
ELC 02.09	Parallel connection of incandescent lamps
ELC 02.10	Parallel connection of ohmic resistors
ELC 02.11 *	Ohmic resistors in parallel and series circuits
ELC 02.12	Voltage division
ELC 02.13	Model of potentiometer
ELC 02.14 *	Dimming by means of a potentiometer

### **Thermal energy derived from electrical energy**

ELC 03.01	Electrical energy is converted into thermal energy
ELC 03.02	The incandescent effect of a filament
ELC 03.03	Conducting wires and resistance wires
ELC 03.04	Safety fuse

### **Work and power**

ELC 04.01	Work and power of electrical current
ELC 04.02 *	Work and power of an electric motor

The experiments marked with \* require additional material outside from the MBC Electricity set.

## **Electromagnetic Induction**

- ELC 05.01 Induction voltages in conductor loops
- ELC 05.02 Creation of induced voltage in a coil
- ELC 05.03 Dependence of induced voltage on the number of turns of a coil
- ELC 05.04 Dependence of induced voltage on the speed of movement

## **Electromagnetism**

- ELC 06.01 \* A current-carrying conductor creates a magnetic field
- ELC 06.02 Magnetic field lines around a current-carrying conductor
- ELC 06.03 Magnetic field lines around a current-carrying conductor loop
- ELC 06.04 Magnetic field lines around a coil
  
- ELC 07.01 A current-carrying coil creates a magnetic field
- ELC 07.02 The magnetic field of a current-carrying coil
- ELC 07.03 Magnetic force of a current-carrying coil
- ELC 07.04 Dependence of the magnetic force on the number of turns from a current-carrying coil
- ELC 07.05 The principle of the electromagnet
- ELC 07.06 Opening and closing a circuit with the aid of a magnet
- ELC 07.07 Model of a relay with make contact
- ELC 07.08 Model of a relay with make and break contact
- ELC 07.09 A self-interrupting circuit
- ELC 07.10 The electric bell
- ELC 07.11 Effect of force on a current-carrying conductor in a magnetic field - conductor swing

## **Transformer**

- ELC 08.01 Voltage transmission on a non-loaded transformer
- ELC 08.02 Current is also transformed
- ELC 08.03 Model of an induction melting furnace
- ELC 08.04 Thomson cannon