

**MOSEM Low-Tech kit educational path**  
**Minds-on 40 simple experiments**

**1. Magnets and magnetic materials**

- 1.1. Magnetic beetles
- 1.2. Magnetic dog
- 1.3. Magnetic materials [[SC2 guide page 56](#)]
- 1.4. Magnets floating on the water

**2. Magnetic fields**

- 2.1. Study of magnetic field with filings [[SC2 guide page 54](#)]
- 2.2. Set of toy magnets + fluxdetector
- 2.3. Magnetic sticks and balls (Geomag) + magnetic micro-fillings table
- 2.4. Series of compasses hanging above a magnet

**3. Magnetic interactions**

- 3.1. Magnetic sticks and dipole magnets – attraction and repulsion
- 3.2. Tile of 5 magnetic rings around a stick
- 3.3. Tile of many magnetic rings in a tube
- 3.4. Attracting force: measurement with springs
- 3.5. Repelling force: measurement based on gravity
- 3.6. “Ski jumping” in a magnetic field

**4. The Earth’s magnetic field**

- 4.1. The unwilling magnet
- 4.2. Measurement of component of magnetic field with compass [[SC2 guide page 67](#)]

**5. Magnetic effect of a current**

- 5.1 Magnets and solenoids studied with compasses
- 5.2 Magnetic field around a wire
  - Oersted’s experiment – vertical version (Ampere's law)
- 5.3 Magnetic field around a wire
  - Oersted’s experiment – horizontal version
- 5.4 Magnetic force between parallel wires (Ampere’s experiment)
- 5.6 Magnetic fields from coils
  - a) Field in the centre of a single coil
  - b) Field in the centre of a solenoid
  - c) Interaction between a coil and a magnet
- 5.7. Iron core (big nail) vertically attracted inside a coil

**6. Magnetic force on a current - Lorentz force**

- 6.1. Pohl's experiment
- 6.2. Turning effect on a coil (turning coil between magnets)
- 6.3. Electric motors
  - a) Paperclip motor
  - b) One loop motor
  - c) Homopolar motor

## **7. Electromagnetic induction**

7.1. Induced EMF and current in a moving wire (inverted Pohl's experiment)

7.2. Induced EMF and current in a coil (magnet is pushed into a coil)

7.3. Eddy currents:

a) lazy pendulum

b) electromagnetic brake

c) the drunken magnet

d) the sliding magnet

e) falling magnet in tube of copper with/without slits

f) soft magnet landing

## **8. Generators – simple AC generator**

8.1. Handle version

8.2. Shaken version

## **9. Coils and transformers**

9.1. Core-free transformer

9.2. Different cores in a transformer