

PHYSICS

CHEMISTRY
BIOLOGY

ENGINEERING



LD DIDACTIC

STUDENT EXPERIMENTS



PHYSICS, CHEMISTRY & BIOLOGY

LEYBOLD®

ADVANCED SCIENCE KITS

PHYSICS

OVERVIEW OF THE RANGE OF TOPICS

With about 450 experiments, both basic and advanced aspects of physics can be treated in the areas of mechanics, thermodynamics, electricity and optics, as well as electronics, wave optics and radioactivity.

In particular, advanced topics such as linear motions, mechanical vibrations and waves, electrical fields, motors and generators or also chromatics are covered.

450
EXPERIMENTS

OPTICS

Topics	Experiments
Geometrical optics with the raybox	
Introductory experiments	4
Reflections at mirrors	4
Refraction	9
Lenses	7
Geometrical optics on the precision metal rail	
Introductory experiments on light	6
Light and shadow in nature	4
Reflection at mirrors	9
Refraction of light	8
Dispersing and recombining colors	2
Lenses / Lens aberrations	9
Combinations of lenses	1
Optical Instruments for enlarging the field of view	6
Optical instruments and the eye	6
Color mixing	
Analysis of path of light through a prism	4
Spectrum colors	6
Color mixing	5

Number of Experiments **90**

HEAT - LIQUIDS

Topics	Experiments
Liquids	
Pressure in liquids	3
Forces acting on bodies in liquids	6
Density of liquids	2
Forces at the surfaces of liquids	2
Heat	
Thermal expansion	6
Heat transfer	4
Thermal insulation	1
Heat capacities	6
States of aggregation and transition	5

Number of Experiments **35**

ATOMIC- AND NUCLEAR PHYSICS

Topics	Experiments
Radioactivity	
Investigation the Geiger-Müller counter tube	8
Investigation of the preparation	4
Statistics of radioactive decay	4
Investigation of various radioactive sources	2
Investigation of the different radiation types	3
Investigation of beta-radiation	4
Screening of gamma-radiation	2
Technical applications of radioactive radiation	5

Number of Experiments **32**

ELECTRONICS

Topics	Experiments
Basic electronic circuits	
Special Resistors	3
Diodes	9
Transistors	9
Transistor applications	
Diode circuits	7
Flip-flop and multivibrator	6
Amplifying circuits	9
Feedback and oscillators	6
Opto electronics	
Experiments with light waveguides	2
Light emitting diodes	2
Photodiodes	1
Solar cells	8
Phototransistors	3
Forked light barrier	1
Light transmitters and receivers	2

Number of Experiments **68**

MECHANICS

Topics	Experiments
Properties of bodies	
Measuring lengths and time	6
Measuring mass and density	5
Forces, Simple machines	
Mechanics of solid bodies	4
Deformations due to force	3
Combining and breaking down forces	3
Oscillations	4
Levers	6
Pulley and inclines plane	8
Mechanical oscillations and waves	
Harmonic oscillations	5
Time dependance of pendulum oscillations	2
Forced oscillations	2
Superposition of oscillations	3
Standing waves	4
Superposition of cord waves	2
Linear motion (with the time recorder)	
Regular motion	4
Accelerated motion	9
Linear motion (with counter or Pocket-CASSY)	
Regular motion	3
Accelerated motion	8
Newton's laws	6

Number of Experiments **87**

WAVE OPTICS

Topics	Experiments
Diffraction	
Diffraction at diffraction objects	6
Diffraction at complementary diaphragms (Babinet principle)	3
Resolution capability	1
Two-beam interference	4
Polarization	
Polarization filters	2
Strain optical double refraction (optical anisotropy)	3
Polarization resulting from reflection and refraction	3
Polarization resulting from scattering	1
Optical activity	1

Number of Experiments **24**

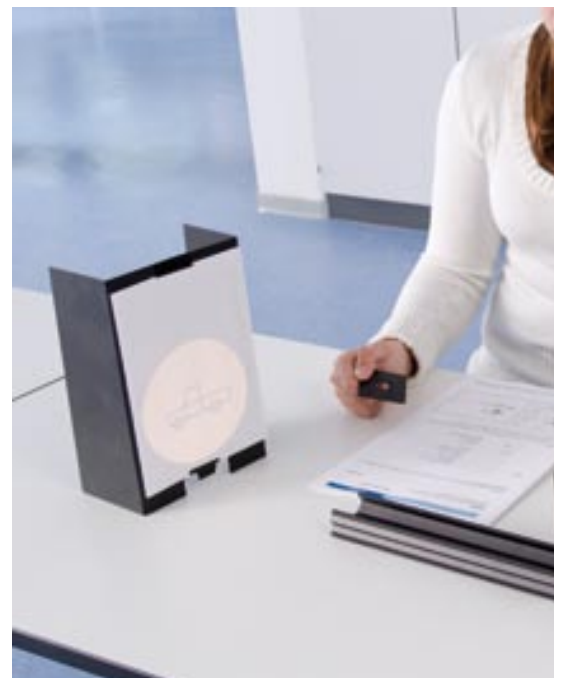
ELECTRICITY

Topics	Experiments
Electrostatics	
Contact electricity	4
Forces between charges	4
Electric induction - effect of charges on neutral bodies	6
Electric induction - effect of charges on a close electroscopes	3
Charge stores, Faraday cup	4
Electrostatic interaction	2
Insulator and conductors	6
Electric Fields	
Electrical charges	2
Electric fields	4
Capacitors	4
Magnetic Forces and Fields	
Effects of magnetic forces	3
Magnetic induction	3
Magnetic fields	6
Basic Electric Circuits	
Circuit and Switches	5
Electrical measuring methods	2
Ohmic resistor	5
Voltages sources	2
Electrical application circuits	5
Electromagnetism and Induction	
Electromagnetism	3
Electromagnetic applications	6
Induction	2
Transformation	2
Technical applications of the induction	3
Coil and capacitor	4
Generators and Motors	
Basic experiments	4
Generators	5
Electric motors	8
Electrochemistry	
Basic experiments	7

Number of Experiments **114**

ADVANCED SCIENCE KITS PHYSICS

OVERVIEW OF THE
RANGE OF TOPICS



- Ideal for the student's hand: great stability and functionality
- Fitting interface solutions for computer-assisted measurements (see also page 22)
- Experimental instructions have enough space for the students' answers. The modular setup allows for different possibilities to further studies and accounts for varying working speeds

Solid and variable mechanical assemblies with special stands and sockets. The basic structure is also used in many experiments for the study of vibrations and waves and of heat, so that students can set up the experiments without wasting time.

Pictured experiment: Pulley block



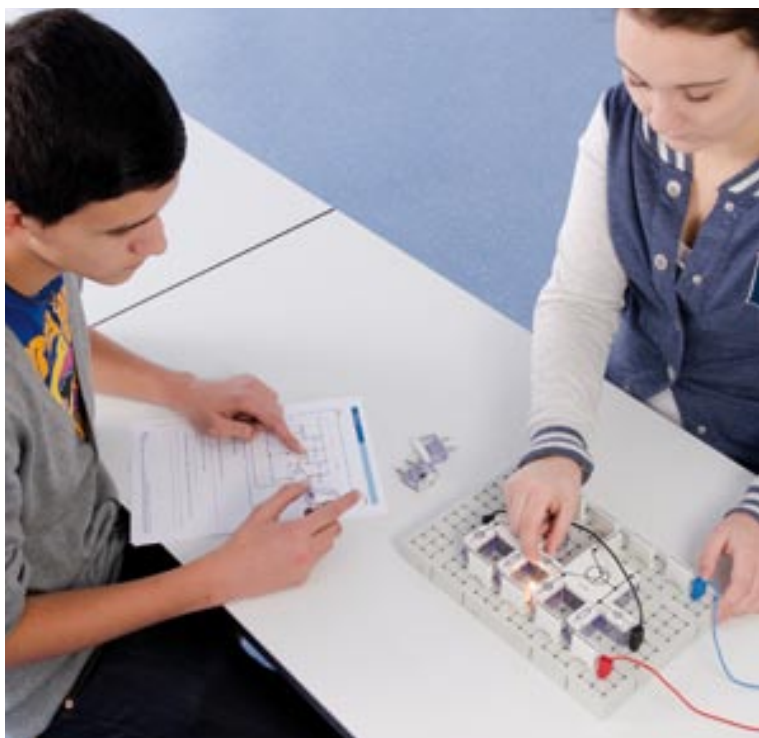
Clear optics assemblies using a solid metal rail as an optical bench. The optical elements are easily held with easy-to-move sliders, and the distance between them can be precisely read on the optical bench's scale.

Wave optic experiments can also be conducted with the same items.

Pictured experiment: Slide projector

For many experiments within all areas, instead of using the traditional measuring instruments, a computer can measure values with Pocket-CASSY. Students can easily record and evaluate measured values with the CASSY Lab 2 software's user-friendly interface.

*Pictured experiment:
Track, accelerated motion between holding magnet and light barrier*



Clearly laid out electric and electronic assemblies with a plug-in board. Completely safe contacting with 4-mm plugs for items and the plug-in board's connectors. The board's front side was designed for many simple circuits; the back side enables complex electronic wiring.

Pictured experiment: Astable multivibrator