

Annex 5: Training Programme

The Teacher Training Programme aims to ensure effective and safe use of the laboratory equipment supplied for Biology, Physics, and Chemistry lessons/lab experiments. The training should enable teachers to confidently integrate new equipment into their teaching practice, in line with Annex 5A. Learning Units for Physics, Biology, and Chemistry.

Training Objectives:

- Demonstrate the use and setup of the supplied devices and accessories.
- Present multiple hands-on experiments aligned with the school curriculum.
- Emphasize safety, maintenance, and troubleshooting procedures.

Training Format and Duration:

	Minimum number of online workshops per LOT	Number of follow-up Q&A online workshops per LOT	Total number of online workshops per LOT
LOT 1: Educational Science Measurement and Dynamics Equipment	3 (one per subject: Biology, Physics, Chemistry)	1 (one)	4
LOT 2: Educational Laboratory Sensors	9 (three per subject: Biology, Physics, Chemistry)	1 (one)	10
LOT 3: Document Scanner Cameras & Notebooks	n/a	n/a	n/a
LOT 4: Robotics Kits	4 (two per each kit)	1 (one)	5

- Duration of each workshop: 1.5 – 2 hours
- Delivery mode: Live online (Zoom, Teams, or similar platform)
- Language: Romanian (with interventions in Russian if clarifications are required by attendees).
- Trainer experience: performed minimum one training in the past 5 years specifically on the educational use of the equipment within the respective LOT.
- Expected number of attendees per workshop: 20 – 50 teachers.
- For the organization of the workshop logistics, such as informing the attendees, creating calendar invites, the UNDP team will provide the list of teachers and their contact details.
- Follow-up Q&A sessions: the objective of these online sessions is to provide troubleshooting support and answer any other enquiries for at least 2 months post-training.
- Note: All workshops will be recorded and saved as references for teachers.

Bidders must include in their proposal:

- Trainer Profiles: short CVs of proposed trainer(s).
- Statement of Exclusivity and Availability for the proposed trainer(s) as per Annex 5B.

Additional Information:

The selected company for LOTs 1, 2, and 4 shall organize the workshops in accordance with the proposed plan of experiments outlined below in Annex 5. The selected company may suggest modifications to the list of experiments if such adjustments are deemed more relevant or beneficial to the school curriculum.

Each selected company under LOTs 1, 2, and 4 shall complete an Excel document (Annex 5A. Learning Units for Physics, Biology, Chemistry) detailing all possible experiments that can be conducted using the equipment from the respective LOT. The document shall align the experiments with the learning units from grades VI/VII-XII for Physics, Chemistry, and Biology (in Romanian language).

The Bidder must provide a formal Statement of Exclusivity and Availability, signed by the proposed trainer. This document shall guarantee the trainer's dedicated commitment and availability to perform all contractual obligations upon the final selection and execution of the service contract.

Deliverables After Training:

- Excel file (5A. Learning Units for Physics, Biology, Chemistry) must be filled with all possible experiments that can be conducted using the equipment from the respective LOT aligned to the Learning Units and grades for Physics, Chemistry and Biology.
- Link to the workshops recordings on any Cloud platform.
- Digital resources package (manuals, guides, other resources)
- Attendance records per workshop.

Proposed Workshops' Plan

LOT 1: Educational Science Measurement and Dynamics Equipment

Workshop 1: BIOLOGY		
Equipment	Experiments according to the curriculum per grade and learning unit.	
	Grade	Learning Unit
Digital Microscope & Monocular Microscope	Grade VI	II. Diversity and Classification of Living Organisms
	Grade VII	I. The Cell – The Basic Unit of Life
	Grade VIII	III. Plants
	Grade X	III. The Cell – A Macro functional Unit of Organisms
	Grade XI	V. Circulation of Substances in the Human Body
	Grade XII	I. Basics of Genetics
Centrifuge	Grade VIII	IV. The Human Body and Health
	Grade IX	I. The Cell – The Basic Unit of Life
	Grade X	III. The Cell – A Macro functional Unit of Organisms
	Grade XII	I. Basics of Genetics
Digital Multimeter	Grade XI	VI. Human Respiration
Workshop 2: PHYSICS		
Equipment	Experiments according to the curriculum per grade and learning unit.	
	Grade	Learning Unit
Caliper	Grade VI	II. Physical Quantities. Measurements
Digital Timer	Grade VI	III. Mechanical Phenomena
	Grade IX	I. Optical Phenomena
Ball Track, Digital Stopwatch	Grade VII	I. Motion and Rest

Ball Track, Digital Stopwatch, Caliper	Grade VII	IV. Work, Power, and Mechanical Energy
Electronic Kit, Voltmeter, Ammeter	Grade VIII	IV. Electrical Phenomena. The Joule-Lenz Effect of Electric Current
Electronic Kit, Coated Neodymium Magnets	Grade IX	II. Field Interactions
Neodymium Magnets	Grade VI	V. Electrical and Magnetic Phenomena
Coated Neodymium Magnets, Voltmeter or Ammeter	Grade X	I. Electromagnetism
Workshop 3: CHEMISTRY		
Equipment	Experiments according to the curriculum per grade and learning unit.	
	Grade	Learning Unit
Digital & Monocular Microscope, Electric Hot Plate	Grade X	I. Organic Compounds. Isomerism and Structure
Electronic Balance, Electric Hot Plate	Grade VII	III. Chemical Reactions
Electric Hot Plate	Grade XI	II. Amines. Amino Acids. Proteins
Electronic Balance	Grade XII	II. Macromolecular Compounds
Digital pH Meter	Grade VII	VI. Acids and Bases
	Grade IX	VI. pH of Reaction Media
Digital pH Meter, Water Distillation Apparatus	Grade XII	IV. Systemic Issues of Chemistry in Life
Water Distillation Apparatus	Grade VIII	II. Dissolution. Solutions
Electrolytic Dissociation Apparatus	Grade IX	III. Aqueous Solutions of Electrolytes

LOT 2: Educational Laboratory Sensors

Sensor(s)	Grade and Learning Unit	Short Description of the Lab Activity
Workshop 1: Biology		
Wireless CO ₂ Sensor (Carbon Dioxide Gas)	Grade VI, Organisms in Their Living Environment	Students measure the CO ₂ level produced by plants during respiration and photosynthesis under different light conditions.
Wireless CO ₂ Sensor (Carbon Dioxide Gas)	Grade XI, Human Respiration	Gas exchange in human respiration is studied by comparing inhaled and exhaled CO ₂ levels.
Temperature Sensor	Grade XI, Humoral Regulation in Humans	Students analyze skin temperature variation depending on physical activity or exposure to different environments.
Temperature Sensor	Grade VIII, Organisms in Their Living Environment	The influence of temperature on the activity of living organisms (e.g. seed germination) is determined.
Wireless CO ₂ Sensor + Wireless Optical Dissolved Oxygen Sensor	Grade XII, Ecology and Environmental Protection	Integrated experiment on the carbon and oxygen cycles in ecosystems.
Workshop 2: Biology		
Wireless Light Sensor	Grade VI, Plants	Students measure light intensity to demonstrate how it influences photosynthesis.
Wireless Light Sensor + Wireless CO ₂ Sensor	Grade IX, Plants	Comparison of oxygen production and CO ₂ absorption depending on light intensity.
Wireless Optical Dissolved Oxygen Sensor	Grade VIII, Organisms in Their Living Environment	Students determine dissolved oxygen levels in water and its relationship to aquatic environment quality.
Wireless Optical Dissolved Oxygen Sensor + Temperature Sensor	Grade X, General Characteristics of Organisms	Measurement of dissolved oxygen variation depending on temperature for aquatic organisms.
Wireless Light Sensor + Wireless Light Sensor	Grade VI, Plants	Students observe selective light absorption by leaves and compare filtered colors.
Workshop 3: Biology		
Wireless Blood Pressure Sensor with Standard Cuff	Grade XI, Circulation of Substances in the Human Body	Monitoring blood pressure before and after physical exercise.
Wireless Heart Rate Sensor with Handle Function	Grade XI, Circulatory System	Measuring heart rate under different conditions (rest, effort, stress).
Wireless ECG Sensor	Grade XI, Circulation of Substances in the Human Body	Students analyze ECG waves and identify phases of cardiac activity.
Wireless Spirometer	Grade XI, Human Respiration	Recording breathing volume and frequency at rest and after physical activity.
Wireless Colorimeter and Turbidity Sensor	Grade VIII, Organisms in Their Living Environment	Evaluating water quality (turbidity, color) to determine pollution levels.

Wireless Colorimeter and Turbidity Sensor	Grade XII, Ecology and Environmental Protection	Comparative analysis of water samples from different environments to study human activity effects.
Wireless Heart Rate Sensor + Temperature Sensor	Grade XI, Locomotor System and Human Motion	Studying the relationship between muscular activity, heart rate, and body temperature.
Workshop 4: Chemistry		
Conductivity + Salinity Sensor	Grade VIII, <i>Water and Solutions</i>	Students measure conductivity of various solutions (salt, sugar, acid, base) to identify electrolytes.
Conductivity + Salinity Sensor	Grade IX, <i>Solutions and Electrolytic Dissociation</i>	Determining the degree of dissociation of solutions by comparing electrical conductivity.
Conductivity + Salinity Sensor + Wireless Temperature Sensor	Grade X, <i>Solutions. Interactions of Substances in Solutions</i>	Studying the influence of temperature on the conductivity of saline solutions.
Conductivity Sensor + pH Sensor	Grade XII, <i>General Notions of Chemical Analysis</i>	Analyzing water samples: measuring pH and conductivity to assess environmental quality.
Wireless pH Sensor	Grade VIII, <i>Water and Solutions</i>	Measuring the pH of various household solutions (lemon juice, vinegar, soap) to classify them as acids or bases.
Wireless pH Sensor	Grade IX, <i>Nonmetals and Their Practically Important Compounds</i>	Studying the acidity of solutions formed from acidic and basic oxides.
Workshop 5: Chemistry		
Wireless pH Sensor + Wireless Temperature Sensor	Grade X, Chemical Reactions – Transformations of Substances	Observing pH variation during a neutralization reaction.
Wireless Oxygen Sensor	Grade VIII, Oxygen. Hydrogen	Determining oxygen concentration produced during hydrogen peroxide decomposition.
Wireless Oxygen Sensor	Grade XI, Unsaturated Hydrocarbons	Measuring oxygen consumption in hydrocarbon combustion reactions.
Wireless CO ₂ Sensor	Grade VIII, Chemical Reactions	Measuring CO ₂ release in the reaction between calcium carbonate and hydrochloric acid.
Wireless CO ₂ Sensor + Oxygen Sensor	Grade XI, Organic Compounds in Everyday Life and Activity	Comparing oxygen consumption and CO ₂ production during the combustion of organic substances.
Wireless Temperature Sensor	Grade X, Chemical Reactions – Transformations of Substances	Measuring temperature variation in exothermic and endothermic reactions.
Workshop 6: Chemistry		
Wireless Temperature Sensor + Conductivity Sensor	Grade IX, Solutions and Electrolytic Dissociation	Correlating conductivity variation with solution temperature.

Wireless pH Sensor + Wireless CO ₂ Sensor	Grade XII, Chemistry in Society	Measuring pH change in water depending on carbon dioxide dissolution.
Conductivity Sensor + Oxygen Sensor	Grade IX, Metals and Their Compounds	Determining corrosion reactions by monitoring oxygen and conductivity levels in the solution.
Wireless Temperature Sensor + pH Sensor	Grade XI, Carboxylic Acids and Esters	Analyzing the esterification reaction: temperature and pH variation during the process.
Conductivity Sensor + pH Sensor + Wireless CO ₂ Sensor	Grade XII, General Notions of Chemical Analysis	Integrated experiment: analyzing water samples for pH, salinity, and dissolved CO ₂ concentration.
Wireless CO ₂ Sensor + Wireless Temperature Sensor	Grade VIII, Chemical Products and Quality of Life	Determining the effect of temperature on CO ₂ release in carbonated beverages.
Workshop 7: Physics		
Wireless Smart Gate Dynamics System	Grade VII, Work, Power, and Mechanical Energy	Calculating mechanical work and kinetic energy using automatically measured speed and time data.
Wireless Motion Sensor	Grade VII, Motion and Rest	Recording the motion of an object over time (position, speed, acceleration) as a graph.
Wireless Motion Sensor + Smart Gate System	Grade VIII, Oscillations and Mechanical Waves	Studying pendulum oscillatory motion and determining its period and frequency.
Wireless Rotary Motion Sensor	Grade VII, Rotational Equilibrium	Students determine torques and equilibrium conditions for a rotational system.
Wireless Rotary Motion Sensor + Dynamics Cart Kit	Grade VII, Work, Power, and Mechanical Energy	Determining rotational and translational kinetic energy in a moving body.
Wireless Smart Gate Dynamics System + Aluminum Dynamics Track + Wireless Dynamics Cart Demonstration Kit	Grade VII, Motion and Rest	Students determine the average speed and acceleration of a body moving down a ramp.
Wireless Pressure Sensor + Ideal Gas Law Apparatus + Wireless Temperature Sensor with Interchangeable Probes	Grade XI, Basic Thermodynamic Concepts (TCM)	Verifying Boyle–Mariotte’s Law and Gay-Lussac’s Law for ideal gases.
Workshop 8: Physics		
Wireless Temperature Sensor with Interchangeable Probes	Grade VI, Thermal Phenomena	Students observe heating and cooling of water and plot the temperature variation graph over time.
Wireless Temperature Sensor with Interchangeable Probes	Grade VIII, Thermal Phenomena	Determining melting and boiling points for various substances.
Wireless Temperature Sensor with Interchangeable Probes + Wireless Pressure Sensor	Grade XI, Basics of Thermodynamics	Studying isothermal, isobaric, and isochoric transformations of gases.

Wireless Weather Sensor with GPS	Grade VI, Physical Quantities. Measurements	Students learn to measure atmospheric parameters (temperature, pressure, humidity, altitude, wind direction).
Wireless Weather Sensor with GPS	Grade IX, Field Interactions	Investigating variations of gravitational field and atmospheric pressure with altitude.
Wireless Spectrometer	Grade IX, Optical Phenomena	Analyzing the spectrum of white light and identifying wavelengths for different light sources.
Wireless Spectrometer	Grade XII, Elements of Atomic and Nuclear Physics	Observing emission spectra of elements (hydrogen, helium) to interpret atomic structure.
Workshop 9: Physics		
Wireless Geiger Counter with Sample Holder	Grade IX, Elements of Nuclear Physics	Measuring radiation emitted by safe sources and discussing types of radiation (alpha, beta, gamma).
Wireless Geiger Counter with Sample Holder	Grade XII, Elements of Atomic Nuclear Physics	Experiment on radiation absorption through different materials.
Wireless Smart Gate System + Wireless Rotary Motion Sensor	Grade VIII, Mechanical Phenomena. Oscillations and Waves	Measuring oscillation period and plotting the simple harmonic motion graph.
Wireless Motion Sensor + Wireless Weather Sensor with GPS	Grade VI, Wind Phenomenon (Pressure and Motion)	Students study the effect of air pressure and speed on the motion of light objects.
Wireless Pressure Sensor + Wireless Temperature Sensor with Interchangeable Probes	Grade XI, Basics of Thermodynamics	Determination of the universal gas constant R through experiment.
Wireless Spectrometer	Grade VI, Optical Phenomena	Studying the decomposition of white light into the colors of the spectrum using a prism.
Wireless Geiger Counter with Sample Holder	Grade X, Elements of Atomic Nuclear Physics. Elementary Particles	Measuring natural background radiation and comparing values across different locations.
Wireless Weather Sensor with GPS	Grade XII, Elements of Astronomy	Correlating atmospheric pressure, humidity, and altitude with astronomical observation conditions.

LOT 4: Robotics Kits

Workshop 1: Educational Sensor Kit		
Subject	Experiments according to the curriculum per grade and learning unit.	
	Grade	Learning Unit
Physics	Grade VII	I. Motion and Rest (Measuring Acceleration and Speed)
	Grade X	I. Electromagnetism (Studying the Magnetic Field)
Chemistry	Grade VII	VI. Acids and Bases (Monitoring pH)
Workshop 2: Educational Sensor Kit		
Chemistry	Grade IX	II. The Chemical Process (Studying Reaction Rate)
Biology	Grade VI	V. Organisms and Their Environment (Biological Weather Station)
	Grade VIII	IV. The Human Body and Health (Monitoring Basic Vital Functions)
Workshop 3: Dual-Level Coding Mini-Robot Classroom Kit		
Physics	Grade IX	I. Optical Phenomena. Laws of Refraction/Reflection (Modeling)
	Grade X	I. Electromagnetism (Simulating the Electric Field)
Chemistry	Grade VII	III. Chemical Reactions (Modeling Reaction Kinetics)
Workshop 4: Dual-Level Coding Mini-Robot Classroom Kit		
Chemistry	Grade X	II. Hydrocarbons (Simulating Isomerism)
Biology	Grade VII	V. Organisms and Their Environment (Digital Modeling of Food Chains)
	Grade XII	I. Fundamentals of Genetics (Simulation of Monohybrid Inheritance)