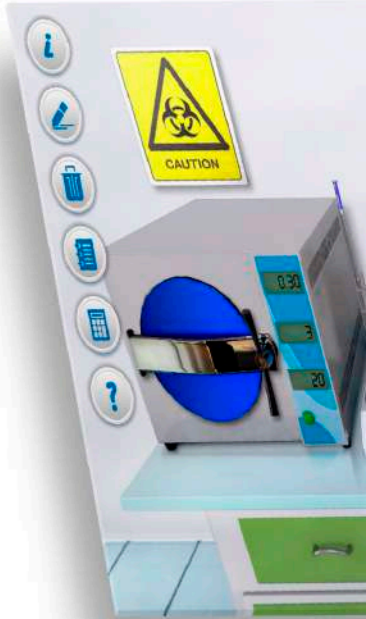
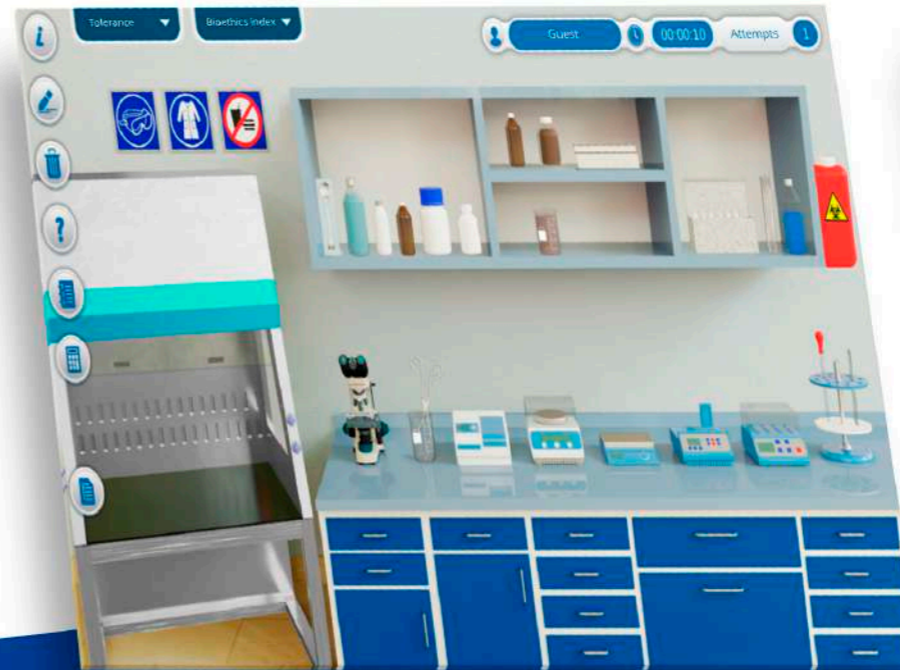


LET'S TRANSFORM  
**LEARNING**  
PROCESSES  
**TOGETHER**



**+500**  
VIRTUAL  
LABORATORIES



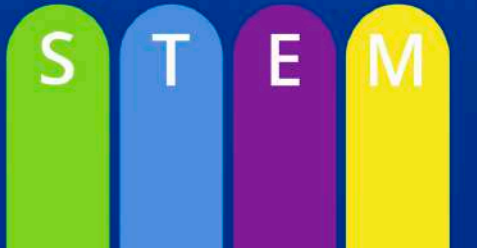
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**PRODUCT**  
**PORTFOLIO**  
EDITION 2022

 CloudLabs



**CloudLabs** is a virtual environment based on curricular content and virtual laboratories, allowing students to carry out more than 500 practices in STEM and vocational areas.

Available online and offline, it has strengthened and transformed secondary, vocational and higher education since 2012.

It combines technology and active learning methodologies to develop scientific thinking, decision-making and problem-solving skills. Costs are reduced and teachers are permanently supported when using and implementing CloudLabs.

These virtual laboratories are focused on elementary, secondary and higher education.

## TECHNICAL FEATURES

CloudLabs can be installed on operating systems such as Windows, Android and Mac OS. It can also be integrated with learning management systems (LMS) through the LTI standard (Learning Tools Interoperability).

### Virtual Laboratories:

- Generation of a numerical grade once a virtual laboratory has been completed.
- Multimedia content with graphic materials such as photographs, illustrations, graphs and cartoons.
- Laboratory simulators based on situations or challenges.
- Free practices available.
- Generation of laboratory reports in PDF format.
- Data verification by the student.
- Attempt counter.
- Practice timer.

### Multimedia content:

- Natural voice-over.
- Home menu divided into learning activities and laboratory practices.
- Each learning activity includes a PDF guide.
- Responsive Design.



## LEARNING METHODOLOGY

CloudLabs has a problem-based learning methodology that allows students to learn through experiences and discovery using active learning techniques such as game-based learning through computer simulations and problem solving using real data.

Problem-based learning allows students to have a more active role in their learning process. By being more engaged, they are motivated to learn and it promotes autonomy and responsibility.

## Advantages

- Development of analytical and decision-making skills.
- Students play a key role that motivates them to learn and sparks their curiosity.
- A combination of ICTs and the problem-based learning methodology.

## Skills

- Logical-mathematical thinking.
- Reading comprehension skills.
- ICT skills.
- Data collection and analysis.
- Development of systemic thinking.
- Problem-solving.
- Decision-making.



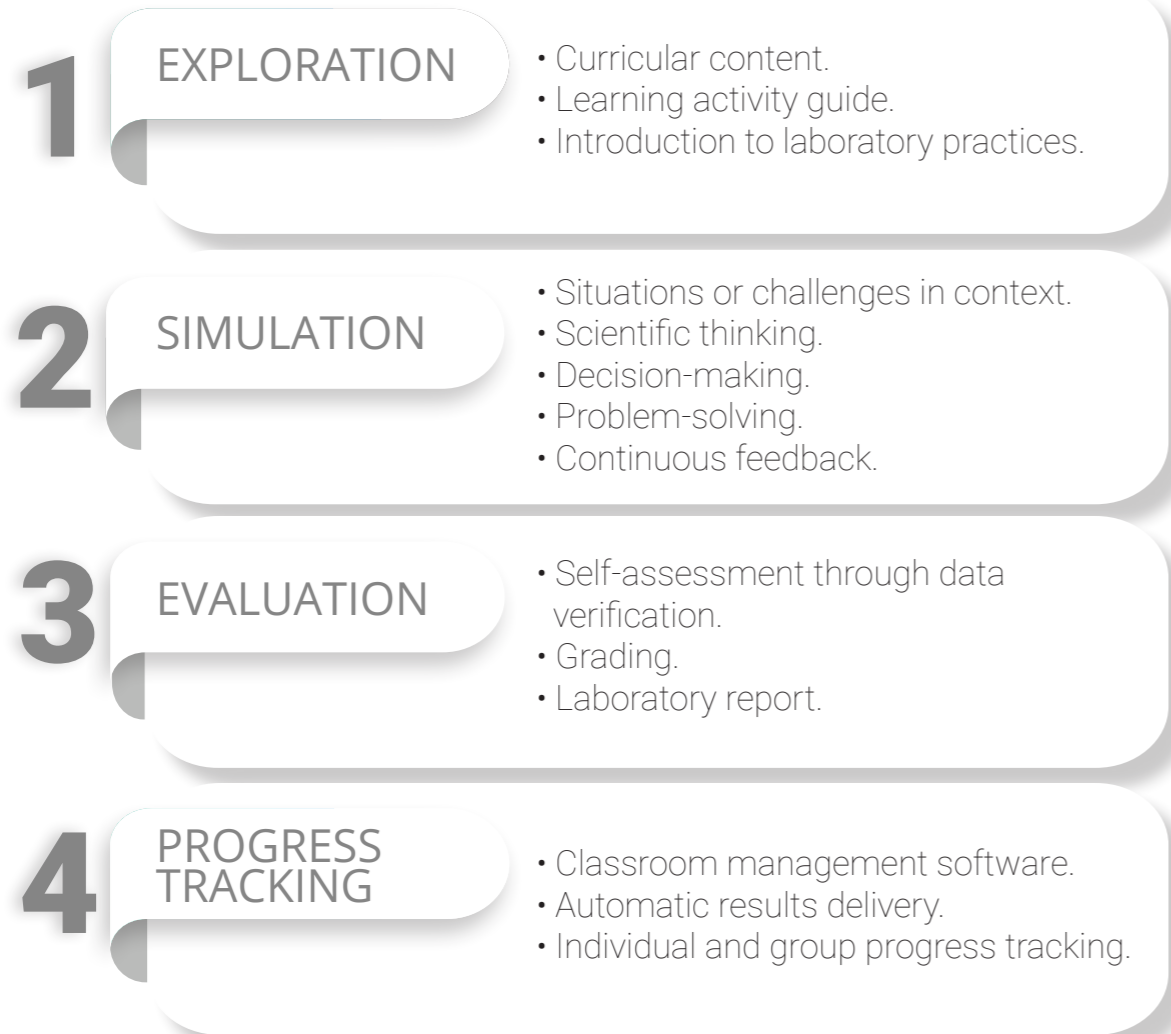
CloudLabs provides simulators designed to encourage learning in the following areas:

- Biology
- General Chemistry
- Analytical Chemistry
- Physics I and II
- Business Administration
- Renewable Energies
- Environmental Resource Management
- Sensors and Actuators
- Process Control
- Secondary School Mathematics
- Middle school Mathematics
- Agriculture
- Biotechnology
- Simple Machines and Mechanisms
- Electronics
- Microcontrollers
- Robotics
- Electrical Networks
- Programmable Automotons
- Electricity

## DIDACTIC STRUCTURE

CloudLabs didactic structure consists of four important stages. The first one is related to exploration. Here students can find out the concepts related to the learning unit. In the second stage, they can access the simulator and solve the challenge posed. The third stage deals with the generation of the learning evidence resulting from the virtual laboratory completion.

Finally, the results tracking and assessment is carried out and group and individual performance is managed.



## PRODUCT LINES

CloudLabs has 20 product lines. They include a wide variety of resources focused on different disciplines.



Our virtual laboratories cover all levels of education

CloudLabs	Numbers of Apps	Elementary School	Secondary School	Higher Education	Remote Access Lab
Natural Sciences	60	✓			
Social Sciences	25	✓			
Basic Mathematics	65	✓			
Biology	52		✓		
Physics	55		✓	✓	✓
Physics II	23			✓	
General Chemistry	60		✓	✓	✓
Analytical Chemistry	25		✓	✓	✓
Secondary School Mathematics	60		✓		
Middle School Mathematics	60		✓	✓	✓
Agriculture	31		✓	✓	✓
Biotechnology	12		✓	✓	
Programmable Automats	14		✓	✓	✓
Process Control	18		✓	✓	✓
Sensors and Actuators	19		✓	✓	
Robotics	15		✓	✓	
Microcontrollers	14		✓	✓	
Electricity	20		✓	✓	
Electronics	16		✓	✓	
Simple Machines and Mechanisms	20		✓	✓	
Electrical Networks	18			✓	
Renewable Energies	13			✓	
Environmental Resource Management	10			✓	
Business Administration	35			✓	
Automotive	15			✓	



## CloudLabs Biology

It is designed to understand natural phenomena. It includes cell and tissue scale models, terrestrial and aquatic biomes and a microscope. There is also a holoprojector to study the universe, a bio-camera, and an anatomical model of the human body for a comprehensive study of its systems.

This subject area has to do with the study of the cell, the ecosystems, soils, the origin and classification of living beings, sexual reproduction, genetics and the human body.

### It contains:

- ✓ 8 learning units
- ✓ 44 virtual laboratories



### Ecosystems

- Types of ecosystems
- Trophic chains
- Balancing an ecosystem
- Environmental factors of an ecosystem
- Classification of living beings



### Photosynthesis

- General components of photosynthesis
- Effect of light in the photosynthetic process
- Factors that affect photosynthesis



### Human body

- Nervous system
- Endocrine system
- Circulatory system
- Respiratory system
- Digestive system
- Blood pressure measurement and analysis
- Respiratory capacity measurement and analysis
- Measurement of factors and stimuli of the human body
- Food and the digestive system processes



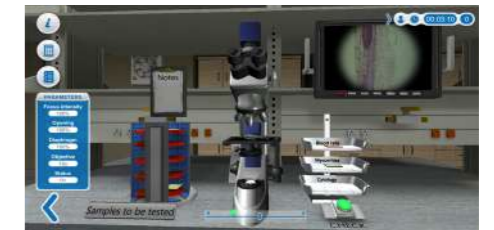
### Genetics

- Mendelian genetics
- Family trees
- RH and blood groups
- Replication of DNA
- Common genetic errors



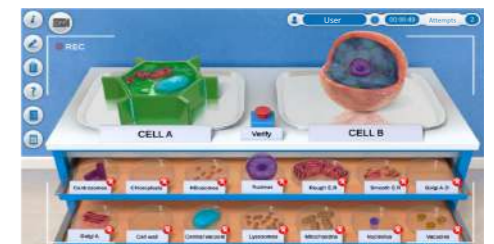
### Microbiology

- Fermentation design
- Influence of physical variables on biotechnological processes
- Analysis of metabolite production in the life stages of a microorganism
- Free practice - Growth and reproduction of a microorganism
- Physiological analysis of common species in biotechnology
- Fermentation station
- Fermentation station - Free practice



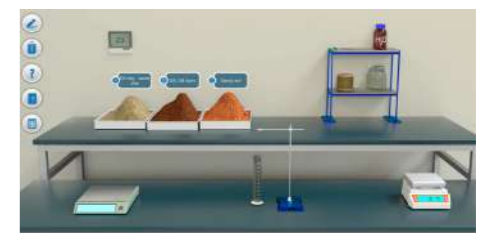
### Cells and tissues

- Cell types
- Cellular metabolism
- Animal tissues
- Plant tissues
- Cell morphology
- Histology: Tissue Basic Types



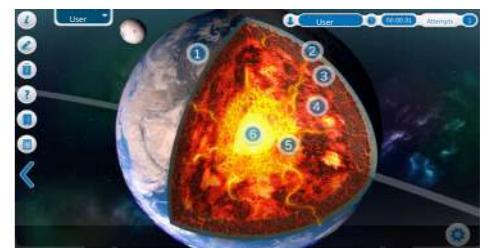
### Soils

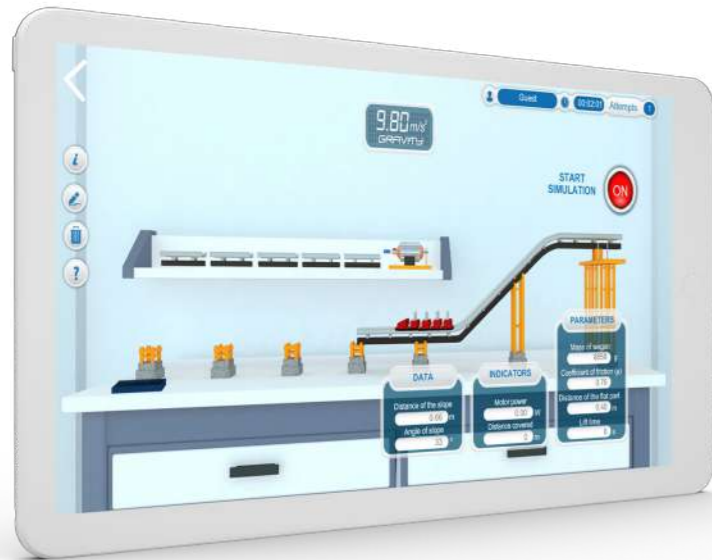
- Characterization of soils
- Soil pollution
- Apparent soil density
- Identification of soil types by granulometry



### Universe and the Solar System

- The Solar System
- Planet Earth
- Layers of the Earth
- Universal gravitation
- Kepler's Laws





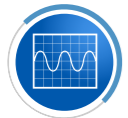
## CloudLabs Physics

It promotes learning through the experimentation and verification of the laws of Physics. It includes laboratory equipment such as oscilloscopes, multimeters, vectors, lenses, mirrors, light sources, voltage sources, photoelectric sensors, timers, thermometers, air rail, cargo lifters, emitters and receivers for different types of waves, among others.

These virtual laboratories include experiments related to rectilinear motion, Newton's second law, statics, pendular motion, parabolic motion, fluids, work, energy, power, thermodynamics, waves, optics and electricity.

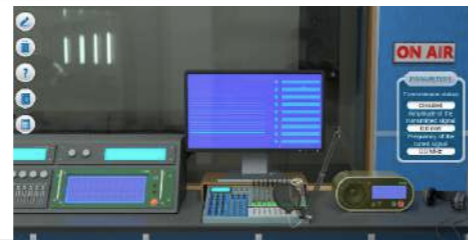
**It contains:**

- ✓ 11 learning units
- ✓ 44 virtual laboratories



### Waves

- Types and characteristics of waves
- Propagation media
- Producing a radio wave
- Sound waves
- Electromagnetic spectrum
- Sound waves - Free practice



### Optics

- Light and optical phenomena
- Dispersion and synthesis of the light
- Spherical mirrors
- Convergent lens
- Geometrical optics - Free practice



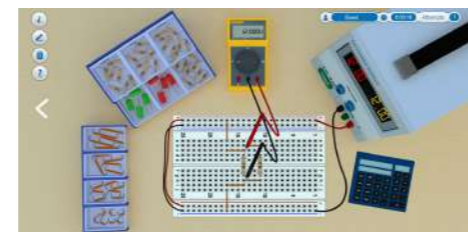
### Fluids

- Archimedes' principle
- Pascal's principle
- Pascal's principle - Free practice



### Electricity

- Electrical quantities
- Series electric circuit
- Parallel electric circuit
- Mixed electrical circuit
- Electrical circuits - Free practice



### Kinematics

- Uniform rectilinear motion
- Uniformly accelerated rectilinear motion
- Uniform rectilinear motion - Free practice
- Parabolic shot
- Parabolic shot - Free practice



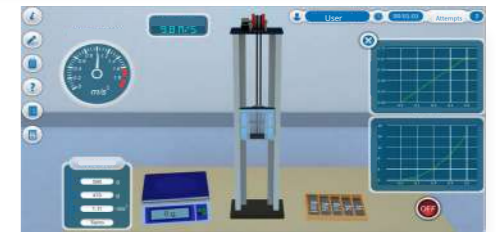
### Vectors

- Vector addition
- Vector subtraction
- Vectors - Free practice



### Dynamics

- Lifting a load
- Displacement of an automobile
- Lifting a load - Free practice
- Displacement of an automobile - Free practice



### Thermodynamics

- Temperature scales
- Specific heat and heat capacity
- Latent heat of vaporization



### Simple harmonic motion

- Simple pendulum
- Simple pendulum - Free practice



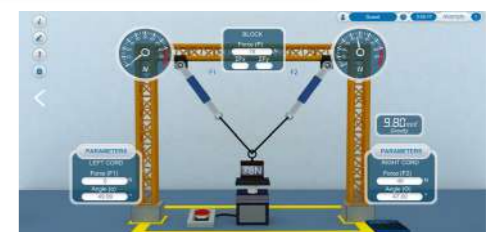
### Work, energy and power

- Energy sources and transformation
- Work and power in a freight elevator
- Work, energy and power in a roller coaster
- Work, energy and power - Free practice



### Statics

- Estimation of the physical effort of an operator - Moment of a force
- The moment of a force - Free practice
- Forces in equilibrium
- Forces in equilibrium - Free practice





NEW  
AREA



## CloudLabs Physics II

CloudLabs Physics II facilitates the study of physical phenomena, applied to the resolution of real-life situations at work, research, and business contexts. It has 18 simulations accompanied by learning units that cover topics such as resistance of materials, metrology, thermodynamics, electromagnetism, and fluid mechanics.

### It contains:

- ✓ 5 learning units
- ✓ 18 virtual laboratories



### Fluid mechanics

- Hydraulic power network
- Pneumatic tube transport
- Unmanned transport system



### Electromagnetism

- Design of a magnetic braking system
- Gauss's Law for electric fields
- Scale model of a magnetic train



### Thermodynamics for refrigeration

- Cold storage for refrigerated transport
- Wood drying kiln design
- Refrigeration system design for metrological laboratory
- Cooling system design



### Metrology

- Quality control of a beer production plant
- Metrological laboratory procedure to issue calibration reports
- Indirect measurements of some quality parameters in liquid fuels



### Strength of materials

- Stress-Strain Testing - deformation of materials used in a bridge
- Mechanical testing for mechanical prostheses
- Factory hardness testing of materials
- Inspection of a new structure for the roof of a stadium



NEW  
AREA



## CloudLabs Renewable Energies

Cloudlabs Renewable Energies enables the study of those clean energies which come from renewable sources and allows the student to know their operation and application in real-life situations and contexts. This area has ten simulations, accompanied by learning units. Some of the topics covered are solar energy, wind energy, hydraulic energy, biomass, and biogas.

### It contains:

- ✓ 3 learning units
- ✓ 10 virtual laboratories



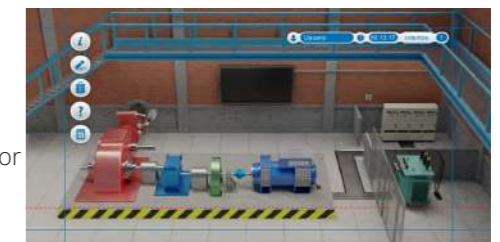
### Solar energy

- Grid-connected photovoltaic power system
- Isolated photovoltaic system
- Photovoltaic system laboratory testing
- Solar heater installation



### Wind and hydropower

- Design of a small hydroelectric plant
- Design and installation of a wind power generator
- Energy regulation for a wind power generation



### Biomass and biogas

- Biogas production as an energy alternative
- Construction of a biodigester to produce biogas in a livestock farm
- Compost application in a vineyard





- It contains:**
- ✓ 2 learning units
  - ✓ 8 virtual laboratories

## CloudLabs Environmental Resource Management

CloudLabs Environmental Resource Management allows the study of different processes and phenomena that affect the environment. It is always oriented to solve, mitigate and prevent problems in this area, and it helps students to develop a sustainable development mindset. CloudLabs Environmental Management has 8 simulations accompanied by learning units that cover topics such as solid waste management, water systems, and climate change.



### Solid waste management

- Classification and use of solid waste at an airport
- Handling and management of hazardous waste in a hospital
- Assembly line production applying the circular economy model
- Design and construction of a sanitary landfill



### Water systems and global change

- Hydrograph development for a water purification plant
- Study of the level of a stream to choose a hydraulic infrastructure
- Water quality analysis and use of macro invertebrates as a bioindicator
- Water balance as a basic tool for integrated resource management



## CloudLabs Electrical Networks

It recreates scenarios for the experimentation and study of substations, potential and current transformers, voltage lines (low, medium and high), tools and meters. It also includes fall arrest equipment for working at heights, and protection elements against electrical risk.

This simulation area allows students to practice maneuvers in an electrical distribution system, to carry out safe work procedures and to comply with the technical regulation of electrical installations and measurement systems.



- It contains:**
- ✓ 3 learning units
  - ✓ 15 virtual laboratories



### Electrical Procedures and Industrial Safety in Medium and Low Voltage Networks

- Connection and fuse calculation in medium-voltage networks
- Application of the 5 golden rules for electrical work
- Calculation of regulation and conductor replacement
- Mounting of hardware and electrical equipment on distribution network poles and mechanical arrangement of conductors
- Connection of a macrometer in a distribution network



### Technical regulation of electrical installations (RETIE) in medium and low voltage

- Inspection of safety distances and structures according to RETIE
- Calculation of resistivity for the installation of a grounding system
- Inspection of pole components in the electrical network at product level
- Inspection of RETIE requirements and safety distances in an indoor electrical substation



### Measuring systems

- Detection of technical problems in distribution macro meters
- Detection of losses in semi-direct measurement with test block
- Detection of losses in indirect metering with two outdoor type elements
- Detection of losses in indirect measurement on three-element poles
- Loss detection using indirect measurement in two-element indoor type cubicle
- Loss detection using indirect measurement in three-element indoor type cubicle





## CloudLabs General Chemistry

It allows the study of organic and inorganic Chemistry in a dynamic, fun and meaningful way and in a flexible and safe environment.

### It contains:

- ✓ 10 learning units
- ✓ 50 virtual laboratories



### Fundamentals of Chemistry

- Instrumentation and volumetric elements
- Concentration of a solution
- Solubility
- Chemical bonds
- Chemical reactions



### Density

- Properties of matter
- States of matter
- Determining density of solids
- Determining density of liquids



### pH and titrations

- Titration by the classical method (Volumetric)
- Titration by potentiometric method
- Titration - Free practice
- pH measurement



### Calorimetry

- Measuring the heat capacity of a calorimeter
- Measuring the latent heat of ice fusion
- Approximate measurement of the enthalpy of an acid-base neutralization reaction
- Measuring the specific heat of metals (copper and iron)
- Determining the mechanical equivalent of heat



### Alcohols, aldehydes, ketones and carboxylic acids

- Drug manufacturing - benzyl alcohol synthesis
- Polymer production - acetaldehyde synthesis
- Solvent production - synthesis of cyclohexanone
- Pest eradication - synthesis of acetic acid



This subject area includes 40+ simulations and their learning units. Some of the topics covered are: fundamentals of chemistry, matter, separation of mixtures, pH and titrations, calorimetry, ideal gases, chemical reactions, alkanes, alkenes and alkynes, alcohols, aldehydes, ketones, carboxylic acids, esters, amides, nitriles, among others.



### Gases

- The Boyle-Mariotte law
- Charles' law
- Gay-Lussac's law
- Dalton's law of partial pressures



### Chemical reactions

- Reactor for amino acid synthesis
- Reactor for amino acid synthesis - Free Practice
- Tests for drinking water control - dichromate chromate ion equilibrium
- Preparation of fertilizer for plants - common ion effect
- Fertilizer production - Displacement of weak acids and bases
- Scale removal in pipelines - Precipitation and dissolution of metal hydroxides
- Production of chemical compounds - Equilibrium of complex ions
- Equilibrium of complex ions - Equilibrium of complex ions influence of temperature



### Separation of mixtures

- Simple distillation
- Decantation
- Filtration
- Evaporation
- Fractional distillation
- Distillation station
- Distillation station - Free practice



### Alkanes, alkenes and alkynes

- Gaseous fuel - Methane synthesis
- Production of anesthetic - Cyclopropane synthesis
- Agro-industrial product - Ethylene synthesis
- Oxyacetylene welding fuel production - Acetylene synthesis



### Derivatives of carboxylic acids and amines

- Propanoic anhydride synthesis - Analgesic production
- Synthesis of methyl benzoate - Heating cost regulator simulator
- Synthesis of n-methyl-4-toluamide - Insect repellent
- Synthesis of 2-ethylhexanonitrile - Manufacture of ceramics
- Synthesis of 4 - nitroaniline - Solvatochromic dye manufacture





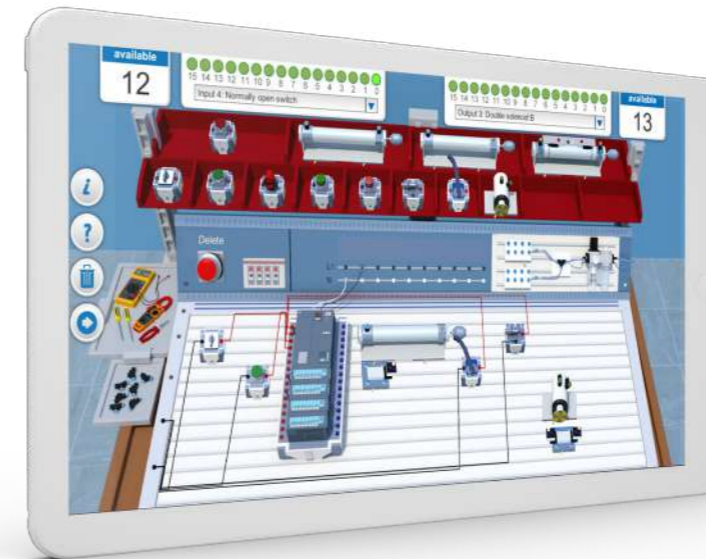


## CloudLabs Analytical Chemistry

It allows the study of the separation of components in mixtures, chromatography, stoichiometric analysis, volumetry and organic analysis in a dynamic, fun and meaningful way in a flexible and safe environment.

### It contains:

- ✓ 5 learning units
- ✓ 20 virtual laboratories



## CloudLabs Programmable Automators

It allows the study of automation systems using a programmable logic controller (PLC) in several environments in order to automate a process. There is a station of sensors and actuators, an electro pneumatic station, three-dimensional plants of a road crossing, an elevator, process tanks, hydraulic and electric actuators and sensors.

The automation processes emulated in this area are performed using the graphical languages Grafcet (stage/transition command graph) and Ladder.

### It contains:

- ✓ 3 learning units
- ✓ 11 virtual laboratories

In this area more than 10 practices can be set up for each programming language, which allow a great variety of automatism to be performed.



### Separation of components in mixtures

- Precipitation gravimetry
- Gravimetry by volatilization
- Extraction of solid substances by solvents
- Partition coefficient



### Chromatography

- Thin layer chromatography
- Paper layer chromatography
- Gas column chromatography
- HPLC chromatography



### Stoichiometry

- Reactions by simple substitution
- Reactions by double substitution
- Preparation of solutions
- Redox reactions



### Volumetry

- Mohr's method - Permanganimetry
- Volhard's method - Dichromatometry
- Fajans method - Iodometry
- EDTA titrations



### Organic analysis

- Classification of organic substances by solubility
- Elemental analysis - List of characteristics of product aspects
- Preliminary tests
- Physical constants



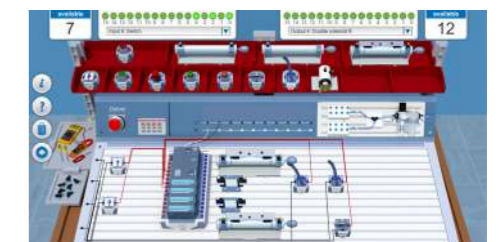
### Programming with Grafcet

- PLC station with Grafcet programmer
- Electropneumatics station with Grafcet programmer
- Grafcet programmer



### Ladder Programming

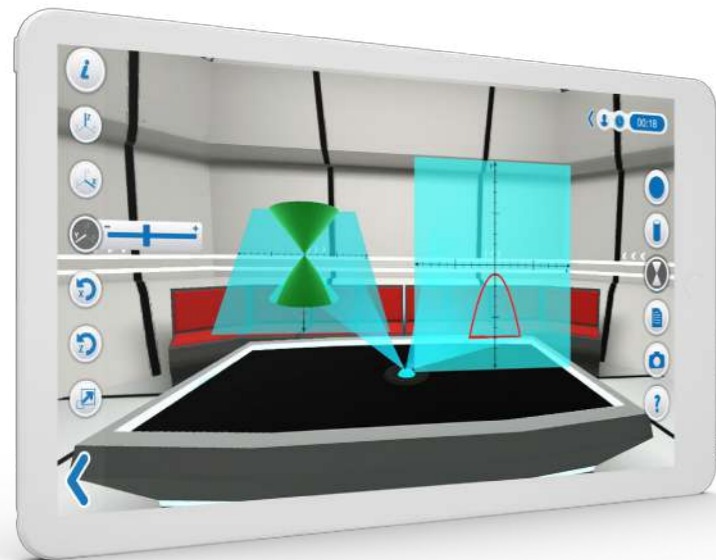
- PLC station with Ladder programmer
- Electropneumatic station with Ladder Programmer
- Ladder programmer



### Plant and process control

- Plant for automation of a road crossing
- Elevator automation plant
- Plant for automation of process tanks
- Plant for automation of sequences with hydraulic actuators
- Plant for automation of sequences with electric sensors and actuators





## CloudLabs Secondary School Mathematics

It immerses students in comprehensive and varied simulation environments that allow an understanding of mathematics as a tool to solve science, engineering and technology situations putting STEM education into practice.

### It contains:

- ✓ 11 learning units
- ✓ 49 virtual laboratories



### Operations, numeration and divisibility

- Variables control in a greenhouse - Addition and subtraction of integers
- Control of irrigation in a greenhouse - Least Common Multiple
- Force applied to a load elevator - Potentiation
- Calculation of load for a hoist - Potentiation
- Construction of a hoist - Logarithm
- Free practice - Pulleys
- Cardboard cutter for boxes - Greatest Common Divisor



### Statistics

- Measurement of child development process - Non-clustered data statistics
- Audit of a marketing campaign - Statistical distribution
- Population control in a butterfly farm - Statistics of grouped data
- Selection of captain for the archery delegation - Statistics of grouped data
- Free practice - Statistics of grouped data



### Polygons

- Construction of a security key - Perimeter of a regular polygon
- Projection of a stellar constellation - Perimeter of an irregular polygon
- Space exploration trip - Perimeter of an irregular polygon
- Construction of a zoo tank - Area of a regular polygon
- Manufacture of a metal pole - Perimeter and area of a regular polygon
- Perimeter of a regular polygon - Free practice



### Geometry

- Dosing of dough for baking cookies - Areas
- Geometric toy - Operations between areas
- Buying an apartment - Areas
- Analysis of archaeological pieces - Areas
- Tangram - Plane figures
- Tangram - Free practice



### Decimals, fractions and proportionality

- Seed sowing - Fractions
- Environmental control of an aquarium - Percentage, decimal and fraction
- Exhibition of works of art - Proportions
- Manufacture of a gear for a watch - Proportions
- Free practice - Proportions



### Algebra

- Design of a tank for a tanker truck - Remarkable products
- Manufacture of a hopper - Algebraic expression reduction
- Manufacture of an electric coil - Remarkable product and reduction
- Maneuvering in an aircraft carrier - Evaluation of algebraic expressions
- Free practice - Remarkable products



### Systems of equations

- Soda production - 2 x 2 equation system
- Production of wood supports - System of equations 2 x 2
- Calculation of electrical energy consumption - 2 x 2 system of equations
- Electrical cable stranding - 3 x 3 system of equations
- Free practice - System of equations 3 x 3



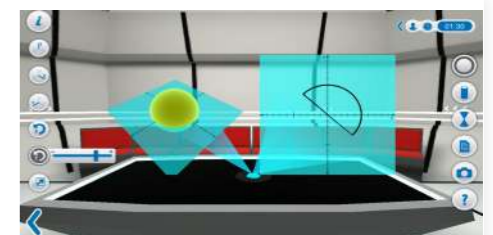
### Radicals and functions

- Construction of a Gemstone cutting - Quadratic function
- Fabrication of a drainage channel - Quadratic function
- Insecticide dosing - quadratic function
- Casting of metals for goldsmiths - Properties of logarithms
- Free practice - Properties of logarithms

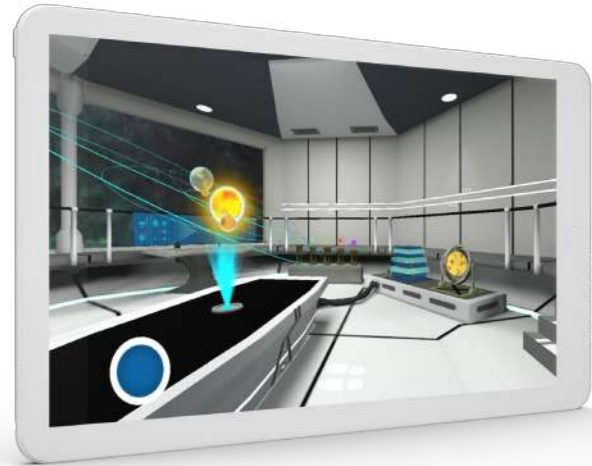


### Geometry of space

- Isometrics of a building - Construction of a regular polyhedron
- Replacement of a part for a machine - Design and measurement of a geometrical figure
- Volumetric calculation of a house - Volume of a geometric figure
- Geometry of a molecular structure - Characterization of a polyhedron
- Volumes in geometric figures - Free practice



## CloudLabs Middle School Mathematics



It immerses students in comprehensive and varied simulation environments that allow an understanding of mathematics as a tool to solve situations in microbiology, biotechnology, astronomy, industry, domotics, aeronautics, economics, architecture, among others.

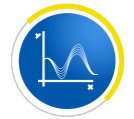
### It contains:

- ✓ 12 learning units
- ✓ 48 virtual laboratories



### Triangles and trigonometric ratios

- Suspension Bridge - Pythagorean Theorem
- London Bridge Maintenance - Trigonometric Ratios
- London Bridge Rescue - Trigonometric Ratios
- Free practice - Triangles



### Trigonometric functions

- Electric current as a sinusoidal signal
- Domain, range and properties of trigonometric functions
- The M.A.S. as an application of trigonometric functions
- Free practice - trigonometric functions



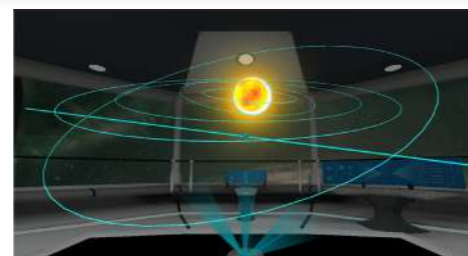
### Trigonometric identities and equations

- Prototype flight of an unmanned aircraft - Trigonometric Equations.
- Free practice - Polar graphs.



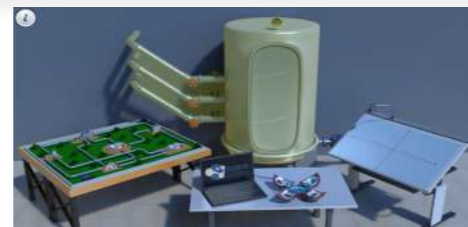
### Straight line, conic sections and polar coordinates

- Trajectory of an asteroid - The straight line.
- Parabolic trajectory of a comet - The Parabola.
- Size and shape of a gas planet - The Circumference.
- Orbit of a natural satellite - The ellipse.
- Hyperbolic trajectory of a comet - The hyperbola.
- Conic sections - Free practice.



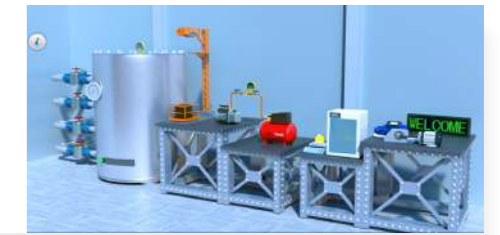
### Matrices and determinants

- Graphs and matrices
- Calculating the trajectory for a celestial body - Determinants
- System of equations for a mixing tank
- Free practice - Transformation matrices



### Real numbers

- Load elevator
- Transformation of mechanical energy into electrical energy
- Temperature of a chemical reaction
- Quality control of humidity sight glasses
- Storage tank



### Functions

- Temperature sensor - Linear function
- Free fall - Quadratic function
- Cutter - cubic function
- Bacterial growth - Exponential function
- pH Scale - Logarithmic Function



### Continuity and limits of functions

- Antibiotic action - Lateral limits
- Maximum population of a culture of microorganisms - Limit to infinity
- Escape velocity - Limit of a function
- Velocity of a universal motor - Limit at infinity



### Derivatives

- Velocity of a chemical reaction - Derivative of a function
- Propagation velocity of a microorganism - Derivatives of exponential and logarithmic functions
- Gravitational acceleration - Implicit derivative
- Free practice - Criterion of the 1st and 2nd derivative



### Probability

- Decrypting the coordinates - Counting techniques.
- Blackjack - Probability of events
- Determining the origin of a pest - Bayes' theorem.
- Bayes' theorem
- Free practice - Probability of events



### Financial mathematics

- Money and personal finance
- Free practice - Personal finance



### Integrals

- Fuel quality control - Polynomial integrals.
- Power of an electrical resistance - Trigonometric integrals
- Vapor pressure of volatile liquids - Logarithmic integrals.
- Free practice - Trigonometric integrals



## CloudLabs Process Control



It recreates commercial and industrial environments such as production and processing plants, temperature control systems for automation and protection systems, regulators and controllers. It allows students to explore, take samples and analyze data, characterize plants, apply different types of controls such as on/off, proportional and PID; facilitating a meaningful and complete approach to industrial process control.

### It contains:

- ✓ 6 learning units
- ✓ 12 virtual laboratories



### Temperature control

- On/off control for temperature
- On/off control with hysteresis for temperature
- Proportional control for temperature



### Level control

- On/off control for level
- Proportional control for level
- PID control for level



### Sampling and data analysis

- Measurement and monitoring of variables
- Statistics of process variables
- Sampling frequencies
- Quality of a mixture



### Protection systems, regulators, transducers and process automation

- Protection systems and regulators.
- Controllers.



## CloudLabs Sensors and Actuators



It allows students to study the input and output elements for the operation of an electronic system, in an innovative and contextualized way in real-life industrial situations. The scenarios available include: lines of production and packaging, metal casting furnaces, and cutting machines. They all use the necessary instruments such as power supplies, multimeters, motors, thermocouples, and transducers, among others. In this area, students

learn to identify different types of sensors and actuators, their characteristics and how to make the appropriate connections of these elements to solve the different challenges posed in which students are the protagonist.

### It contains:

- ✓ 4 learning units
- ✓ 15 virtual laboratories



### Digital sensors

- Sorting of materials in a recycling company
- Sorting of products for dispatch in a catalog sales company
- Start-up of a production line for sodas packaging
- Free practice - characterization of digital sensors



### Analog sensors

- Temperature sensors
- Load cells
- Position sensors
- Characterization of thermocouples



### Actuators and control elements

- AC motor control
- Pneumatic actuators
- Hydraulic actuators
- Stepper motor control
- Control of a servomotor



### Transducers

- Linear transducers
- Non-linear transducers



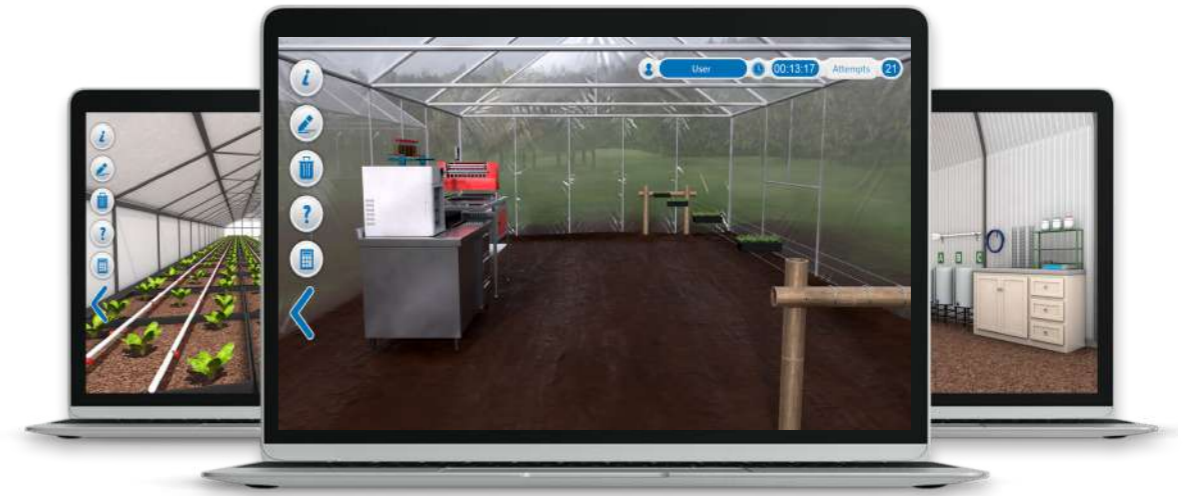


## CloudLabs Agriculture

It provides students with meaningful learning experiences in a virtual environment through simulations that allow the construction of chapel, tunnel and elliptical greenhouses using different roof options and heating and cooling systems.

### It contains:

- ✓ 8 learning units
- ✓ 23 virtual laboratories



There are drip irrigation systems, aspersion and fogging, tillage and agro-systems, among others. This line provides laboratory practices related to greenhouses and climate control, irrigation systems, crops, management of crops under cover, agro-systems and agroecosystems.



### Greenhouse structures and roofs

- Greenhouse construction
- The greenhouse environment
- Free practice - Construction of a greenhouse



### Irrigation and fertigation control in greenhouses

- Lettuce irrigation in greenhouses
- Preparation of fertigation solutions
- Fertigation schedule for a lettuce crop
- Free practice - Irrigation under cover



### Seedbeds and cultivation techniques

- Quality analysis of seeds for sowing
- Determination of germination percentage for a crop
- Seeding density
- Free practice - Establishment of a lettuce crop



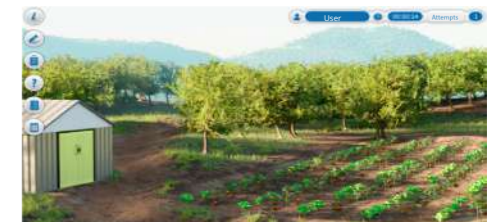
### Crop administration and management

- Harvest and postharvest costs of a tomato crop
- Fixed costs in the establishment of a tomato crop
- General costs of a tomato crop in the management stage of the crop - Free Practice
- Variable production costs in the management of a tomato crop



### Agrosystems

- Agroclimatic conditions
- Agrosystems
- Crop associations and rotations
- Crop production arrangements



### Agricultural land

- Tillage
- Operation of agricultural tools and planting materials
- Crop propagation, adaptation and growth maintenance work
- Tracing, establishment and management work





## CloudLabs Biotechnology

It offers a complete laboratory with all the equipment and supplies necessary to carry out in vitro cultures and genetic improvement of plants. In these laboratories, students can carry out procedures for the preparation of Murashige and Skoog (MS) media, seeding and incubation of explants and comparisons between several treatments for explant growth, bacterial transformation and plant transgenesis in modern laboratory environments.

### It contains:

- ✓ 4 learning units
- ✓ 8 virtual laboratories



### In vitro cultures

- Preparation of culture media
- Seeding and incubation of explants
- Comparison of explant growth treatments
- Free practice - Treatments in explant growth



### Plant breeding

- Bacterial transformation
- Plant transgenesis
- Verification of plant transgenesis
- Free practice - Plant transgenesis



## CloudLabs Electricity

It recreates scenarios for the study of motor control and the analysis of electrical circuits. Students will learn about the characteristics and operation of induction motors. They will also analyze circuits by meshes and nodes; and perform circuit simplification using Thevenin and Norton.

### It contains:

- ✓ 4 learning units
- ✓ 16 virtual laboratories



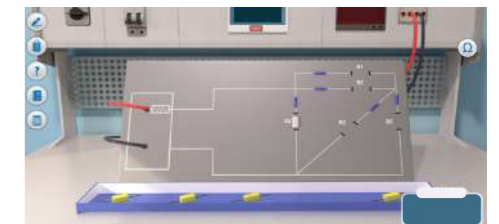
### Motor control

- Induction motor load characteristics
- Star-delta starter for an induction motor
- Soft starter for an induction motor
- Insulation, continuity and short circuit tests



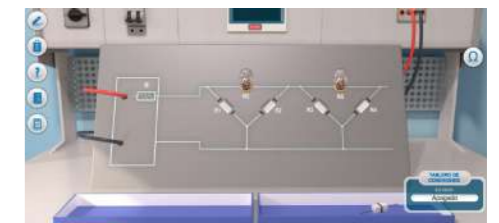
### Analysis of electrical circuits

- Simple circuit analysis by nodes
- Simple circuit analysis by meshes
- Complex circuit analysis by nodes
- Complex circuit analysis by meshes



### Solving electrical circuits

- Simple circuit reduction by Thévenin
- Complex circuit reduction by Thévenin
- Simple circuit reduction by Norton
- Complex circuit reduction by Norton



### Phasors

- Reactive power compensation in a sawmill
- Per-unit power system
- Power transformer testing
- Circuit analysis using phasors





## CloudLabs Microcontrollers

It introduces students to the extensive world of programming. It allows the interaction with projects using a block-structured language that includes sensors and actuators. It also allows the implementation of home automation projects and bank queue management system, recreating, real scenarios such as programming electronics at laboratories, a home automation system and an office with an electronic queue management system.

**It contains:**

- ✓ 2 learning units
- ✓ 12 virtual laboratories



## CloudLabs Simple Machines and Mechanisms

It recreates new industrial environments integrating the necessary tools to study and understand the concepts related to simple machines, transformation and transmission of movement in real contexts where students play a key role.

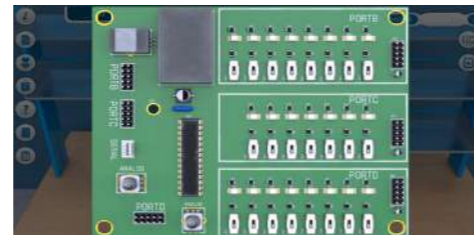
**It contains:**

- ✓ 3 learning units
- ✓ 17 virtual laboratories



### Microcontroller programming

- Programming a simple alarm
- Programming of a temperature control
- Programming of a vehicle collision sensor
- Programming a microcontroller - Free practice



### Microcontroller applications

- Shift system for store
- Shift system for financial office
- Shift system - Free practice
- Domotic application for lighting control
- Domotic application for fire protection
- Domotic application for temperature control
- Home automation application for intruder alarm
- Home automation system - Free practice



### Simple Machines

- The lathe as a simple machine - Lifting loads
- The lathe as a simple machine - Free practice
- Crane arm - Lever application
- Arm crane, application of the lever - Free practice
- Simple inclined plane machine
- Simple inclined plane machine - Free practice
- The pulley as a simple machine



### Motion transmission

- Speed Multiplier with Gear Train
- Speed reducer with gear train
- Gear train - Free practice
- Speed reducer with pulley train
- Pulley and belt system - Free practice
- Chain drive system



### Motion transformation

- Rack and pinion system for opening a roof in a greenhouse
- Screw-nut system for a manipulator robot
- Worm gear system for a telescope
- Crank crank system for a steam engine





## CloudLabs Electronics

It allows the study of the basics of electronics in an innovative, safe and dynamic way. It includes logic gates, Boolean algebra, combinational systems and sequential logic. It also recreates remarkable scenarios and situations in real contexts, where students can interact with the simulators and learning units.

In the virtual laboratories, it is possible to interact with equipment such as voltage sources, logic tips, switches, indicator lights, motors, counters, flip-flops, and converters, among other electronic elements.

### It contains:

- ✓ 4 learning units
- ✓ 12 virtual laboratories



### Combinational gates and systems

- Identification of logic gates
- Combinational system for electronic locker locks
- Combinational system for package distribution plant
- Combinational system to control the level of a tank
- Combinational systems - Free practice



### Sequential logic

- Flip - flops
- Counters
- Shift registers
- AD and DA converters



### Power electronics

- Design and construction of a dimmer switch
- Lighting of a tunnel with single-phase rectifier control and RL-generator load
- Buck-boost converter design for the vehicle starter



## CloudLabs Robotics

It recreates three-dimensional environments with polar robotic arms, five-axis arms and line trackers. It provides students with interactive and eye-catching environments to new fascinating scenarios.

Students can explore different ways to program robots using a graphic block language, block language to solve challenges dealing with manipulation, control, storage and parts relocation.

### It contains:

- ✓ 4 learning units
- ✓ 11 virtual laboratories



### Manipulators

- Direct programming of a cylindrical robot
- Indirect programming of a cylindrical robot in polar plane
- Indirect programming of a cylindrical robot in Cartesian plane
- Free practice - Programming of a cylindrical robot
- Programming of articulated arm for stacking boxes
- Programming of articulated arm for parts storage
- Free practice - handling and storage of parts



### Mobile robotics

- Programming of a mobile robot for a simple oval circuit
- Programming a mobile robot for an irregular circuit with obstacles
- Programming a mobile robot for a labyrinth type track
- Programming a mobile robot - Free practice







## CloudLabs Business Administration

CloudLabs Business Administration facilitates the development of skills such as planning, organization, control, and analysis, by applying theoretical concepts to real-life situations and contexts that we encounter daily at work. CloudLabs Administration has three simulations accompanied by learning units. Some of the topics covered are document management, archive, marketing, services, and time optimization.

### It contains:

- ✓ 7 learning units
- ✓ 28 virtual laboratories



### Talent management

- Recruitment process
- Employee retention
- Organizational environment
- Performance evaluation



### Administrative management

- Corporate elements and their impact on strategic planning
- Organizational structure design
- Key performance indicators in a company
- Leadership and its communication channels
- Types of control



### Services

- Internal audit
- Customer Service
- External recruitment process (KPO)
- Business process outsourcing (BPO)



### Logistics

- Inventory management
- Dispatch process
- Returns
- Supply chain



### Accounting and finance

- Economic analysis
- Income Statement Analysis
- Balance sheet of a company's financial position
- Financial planning in an organization



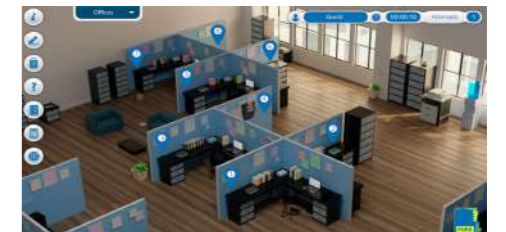
### Economic engineering

- Financial assistance for a project extension
- Evaluation of credit alternatives for a company
- Internal rate of return for investment projects
- Money over time



### Administrative assistance

- Optimization of PQRS process times
- Business document management
- Market and service analysis





NEW AREA



## CloudLabs Automotive

CloudLabs Automotive enables the study and diagnosis of automotive systems through the use of tools that facilitate fault identification, allowing students to recognize and apply them in real-life situations and contexts. Additionally, CloudLabs Automotive covers topics such as starting and lighting systems, enlistment, injection systems, safety, suspension, and steering.

**It contains:**

- ✓5 learning units
- ✓10 virtual laboratories



**Starting and lighting systems**

- Starting system
- Lighting system



**Fuel injection system and CAN-BUS protocol**

- Injection system
- CAN-BUS protocol



**Preparation and reception**

- Preparation and receipt of a vehicle for maintenance



**Safety, brakes and comfort**

- Brake systems
- Security systems



**Suspension and steering**

- Suspension system
- Alignment and balancing



**120 Virtual laboratories**  
**30 Learning Units**



## CloudLabs Elementary Education

TECHNICAL AND PEDAGOGICAL COMPONENTS

- Storytelling included.
- Natural voice-over included in each of the simulations.
- Avatar selection for every simulation.
- Sound effects.
- Emoticons as positive reinforcement of success and failure.
- Didactic support for ensuring the practices completion.
- Identification of problems to advance or complete a task within the simulation.
- Feedback from the teacher that mentions concepts or conclusions related to the topic of study.
- Laboratory report that records the fulfillment of the goals set.



**Based on challenges to overcome**

## CloudLabs Natural Sciences

Have you ever been asked, why is there day and night? Why do fish die outside of water? or why does water turn into ice? CloudLabs Natural Sciences answers these questions and many curious questions that children have, in an engaging way while they face challenges in real-life scenarios.

### It contains:

- ✓ 12 learning units
- ✓ 48 virtual laboratories



### The living environment

- Taking care of aquarium fish
- Taking care of ants in the terrarium
- Plants and climate change
- Life cycle of a butterfly



### Ecosystems and food webs

- Who feeds whom?
- Aquatic and terrestrial ecosystems
- What impact does the environment have on us?
- Wow, why are there so many flies?



### Simple machines calculation and building

- Making figures for toys
- Creating zoo animals
- Playing with water
- Removing salt from sea water



### Light and sound

- What is light?
- How are shadows useful to us?
- Why does my voice sound different?
- Why do we see lightning before hearing thunder?



### Fundamentals of simple machines

- Let's build our own seesaw
- The water well
- Loading barrels onto the truck
- Let's build our own car



### The physical environment

- How does a light bulb work?
- Let's build a helicopter
- Let's make an electric stove
- How can I generate electricity with water?



### Living things, the environment and the senses of the human body

- Treasure hunt
- Materials to build a toy
- Why do living things need food?
- Why do living things die?



### The Sun, Earth and Moon

- Why do we have day and night?
- Why are there nights when there is no moon?
- Let's predict the weather
- Origami model airplanes



### Measurement, calculation and magnitude estimation

- Who will win the race?
- What's the heaviest tool in Dad's tool kit?
- Playing with the ruler and scales in the classroom
- Making our own measuring tool!



### Abiotic factors

- Why does water turn into ice?
- Why does paper burn and my bicycle get rusty?
- What is an ecosystem made up of?
- Why do fish die if they are out of the water?



### Measurable attributes in a mixture

- Preparing mixes in the chef's kitchen
- Cooking at home
- Designing my city
- Measuring at the amusement park



### Nutrition and the organ systems

- How do we perceive sounds?
- What happens when we do not eat healthy?
- Why does our heart beat faster when we exercise?
- Why do we see colors?





## CloudLabs Mathematics

Can you imagine learning mathematics while traveling through a prehistoric animal museum, making pizzas and salads, or going on an African safari expedition? Meet different and exciting ways to learn with CloudLabs Mathematics.

### It contains:

- ✓ 13 learning units
- ✓ 52 virtual laboratories



### Operations, relations, quantities and comparing numbers

- Let's play with a light board
- Playing with shapes and colors
- Learning about farm animals
- Building my first calculator



### Data collection, classification, organization and representation

- Let's prepare a pizza
- Let's prepare a salad
- Building a bridge
- Paper airplane flying competition



### Objects, relationships and environment

- Playing with shadows
- Balancing the scales
- Creating my robot friend!
- Organizing the toy store



### Geometric properties

- Construction of a catapult
- Helping with the move
- Turning drawings into real shapes
- Organizing an art exhibit



### Rational numbers

- How strong am I?
- Children's party
- Let's play roulette
- Candy factory



### Cartesian coordinates

- Discovering the hidden message in the jigsaw puzzle
- Saving the Earth
- Exploring Africa
- Avoiding a pandemic



### Measurement terms and attributes

- Throwing toys
- Building a scale
- Building a pet house
- Making a fish habitat



### Objects, trajectories and positions

- Microorganisms that can cause diseases and how to fight them
- Sand castle
- Robot programming
- Let's rescue the robot



### Solving problems with numerical collections

- Tell me who goes the furthest
- Discovering cells
- Organizing fabric for doll's clothing
- Organizing fabric for doll clothes



### Problem solving through estimation and calculations with basic operations

- Bridge with straws
- Let's make a puzzle
- Packing gifts
- Construction of a model of the Parthenon of Athens



### Graphical representation of data

- What size aquarium do I need for my fish?
- Construction of a model airplane
- Birds at the zoo
- Will it rain in the next few days?



### Figures, solids and potentiation for problem solving

- The cake machine
- Build your own space house
- How big are the celestial bodies
- Geometric adventure



### Statistical representation and occurrence of events

- Am I eating healthy?
- Can we always win at rock paper scissors?
- How tall am I?
- Who wins the Parcheesi?





## CloudLabs Social Sciences

Would you like to travel back in time, find a lost treasure or be a ship captain and sail the ocean? CloudLabs Social Sciences allows you to do this and even more while playing and having fun.

### It contains:

- ✓ 5 learning units
- ✓ 20 virtual laboratories



### Boundaries and geographical characteristics

- Crossing the desert
- The sundial
- The geographical environment
- The urban environment



### Economic and social organization

- Flying across oceans and continents
- Prospering my coastal city
- Local products fair
- What is the region where I live like?



### Geographic and astronomical position and communication

- Sending messages - Forms of communication
- What can we grow according to the climate of our region?
- Renewable energies
- What is the astronomical position?



### Geographic and socioeconomic environment

- Finding the oasis
- Discovering different places in the world
- My own landscape
- A day as mayor of the fantastic city



### Territorial organization

- Drawing and delimiting maps in a region
- The importance of the environment
- My region soils
- Let's take a census



## CLASSROOM MANAGER

The classroom manager allows to track the progress and results achieved by students as they develop CloudLabs laboratory practices.

Teachers will be able to keep track of students' performance and progress.

At the **"CloudLabs Ranking"** module, you can see the ranking of your students by group, school and at a global level.

Automates the submission of student-generated lab reports.



## IT PROVIDES THREE DIFFERENT USER ROLES

### Administrator

It allows the creation and assignment of users, groups and subjects.

### Teacher

It performs laboratory practices assessment and creates real-time announcements.

### Student

It goes through the laboratory practices, grades and rankings.



## AVAILABILITY ONLINE / OFFLINE

LMS INTEGRATION THROUGH THE LTI STANDARD

# CloudLabs **Academy**

The platform has video tutorials and step-by-step guides with the procedures to follow for the development of laboratory practices.



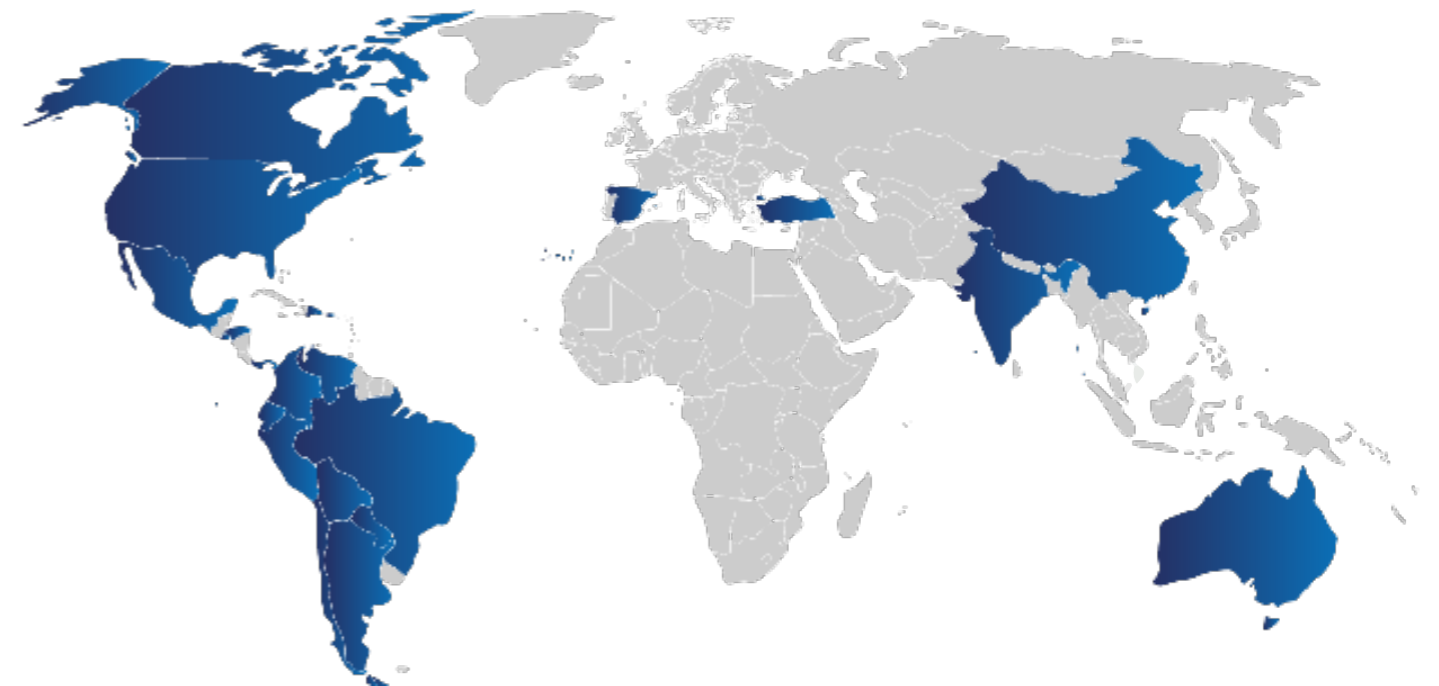
# CloudLabs Impact

We revolutionize education through innovation, technology and high creativity transforming the minds of young people and teachers around the world.

**Now in**  
**+35 countries**

**+27.000**  
Teachers trained.

**+650.000**  
Students impacted approx.



**+20.000**  
Devices with CloudLabs.

**+4.800**  
Institutions with CloudLabs.

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