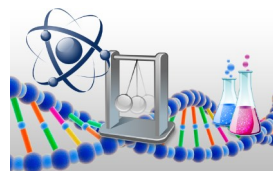


# PCB301

All Science



## Mobile Science Laboratory

The All Science teaching platform is a full-featured **Mobile Sciences Laboratory (MSL)** for the natural sciences (Physics, Chemistry, Biology) laboratory works in the secondary level education to be operated by the teacher. It's designed for the **demonstrations, experiments** and appropriate **laboratory work** in Physics, Chemistry and Biology. The complex includes laboratory equipment, instruments, digital instrumentation, interactive learning resources, multimedia and test materials, interrelated and complementary to each other for the experiments and observations on the program.

### The MSL PCB 301 complex consists of:

- 1) The Universal Mobile cart base.
- 2) The experimental kits for the teacher.
- 3) The Didactic application PCB 100.

Every PCB 301 is supplied with special didactic **software** that allows training in the disciplines of Physics, Chemistry and Biology of the respective curriculum programs by using modern technology, interactive teaching tools and STEM methodology and utilizing all the offered equipment.

This **PCB 100 application**, is divided into 3 large categories: Physics, Chemistry and Biology. Each category of the PCB100 application is also divided into topics, each topic is divided into sections and each section into subsection. In each subsection you can find the **Presentations**, the related **Multimedia or Videos** and the **Simulations**. Furthermore, there are the **Demonstrations** for the teachers and the **Activities** for the students. This distinction is due to the different materials used in the experiments. Different kits for

Teacher (**BT, PT** and **CT** series) and Student (**BS, PS** and **CS** series) are provided.

In the PCB 100 application you can find different support modules such as:

The **Inventory** which contains all the materials from the specific kits that are used in each lesson divided.

The **Glossary** which contains an alphabetical keyboard and by pressing each letter you can find words-meanings and terminology.

The **Virtual Application** which has two subunits: the **Simulators** (you can find simulations of specific experiments using the exact B100 equipment or generic lab simulations related to the sub topic) and the **Multimedia** presentations (showing a relevant phenomenon in some topics).

The **Science Support** module which is also divided in two subunits: the **Curriculum** (an index and search utility to find all the demonstrations and the activities numbered with links that take you to the experiment by searching based on the title of the section or subsection to which it belongs) and the electronic **Manuals**, including Safety guides, Operational Videos etc. and all the sub applications needed by the teacher (i.e. Data Acquisition application, Classroom management applications, Student response application).

The provided kits and the facilities of the Mobile science cart offer all the equipment and support to implement the pedagogical processes in the subject of Physics, Chemistry and Biology. Analytically the PCB 100 topics, sections and subsections supported by the PCB 301 MSL kits and the PCB 100 application are presented below.

### ALL SCIENCE MSL KITS \*

<b>PT 2010</b> Teacher support kit	1
<b>PT 2011</b> Mechanics	1
<b>PT 2012</b> Matter and Thermo	1
<b>PT 2013</b> Electromagnetism	1
<b>PT 2014</b> Optics	1
<b>PCB 1001</b> Support kit	1
<b>PCB 1002</b> Support kit	1
<b>BT 4001</b> Microscope	1
<b>BT 4002</b> DNA module set	1
<b>BT 4003</b> Anatomy models	1
<b>CT 3001</b> Chemistry	1
<b>CT 3010</b> Set of Molecule models	1
<b>CT 3011</b> Acid and Bases	1

\* Note: Quantity of sets per MSL cart

The **Didactic application** also comes with **new add-on modules** such as:

1. **Classroom management system**
2. **Student response system** which support Android Pad and Smart phone user interface.
3. **Classroom Performance** Evaluation and Statistics.
4. **Teacher** add-on content **Link Interface**.
5. **Voice file** add-on **Annotation** utility.

# PCB301

Mobile Science Laboratory

All experiments of PCB 100 are conducted either with the conventional measuring devices or with the use of data acquisition system including a variety of sensors and state of the art data loggers. This Digital lab is provided with the MSL kits in order for the students to enter in the Digital Laboratory Technology. Force, Pressure, Temperature, Electromagnetic field, Voltage, Acceleration, Current, Light, Sound, Photogate, CO<sub>2</sub> and O<sub>2</sub> are some of the sensors provided to the students to conduct their experiments.

The PCB100 interconnects the Teacher with the Students in a **uniform platform**. Theory presentations with interfaces to any Student Response system or Interactive board, Teacher Demonstrations, Lab Simulations, Virtual measurement simulations, Data acquisition applications, Multimedia presentations, Student experiments, Student activities and student quizzes and tests jointly provide **the most modern platform in Science teaching**.

The PCB 100 application also includes various utilities as

Glossary, Instructions for different devices in the mobile cart, the inventory of the Mobile lab, the software applications which are used during the teaching process. Analytically:

◆The **Physics** topics, sections and subsections supported by the MSL kits and the PCB100 application are presented below:

- Mechanics**  
Dynamics - Kinetics
- Energy**  
Work - Energy - Waves - Radiation
- Matter & Thermo**  
Measurements – State of Matter – Thermodynamics
- Electromagnetism**  
Static - Dynamic - Magnetism - Electromagnetism
- Optics**  
Properties of Light – Light phenomena

◆The **Chemistry** topics, sections and subsections supported by the MSL kits and the PCB100 application are presented below:

- General Chemistry Process**  
Evaporation - Purification - Distillation – Enthalpy – Electrochemical conductivity – Electrochemistry

## Chemical Structure

Atomic Structure – Determining Ion Concentration - Chemical Bonding

## Chemical Reactions

Reactivity - Decomposition – Acid and Bases – Salts – Principles of Stoichiometry – Stoichiometry in Chemical Equations – Oxidation and Reduction – Redox Reactions

## Organic chemistry

Introduction to Organic Chemistry – Hydrocarbons – Organic Compounds.

◆The **Biology** topics, sections and subsections supported by the MSL kits and the PCB100 application are presented below:

## Genetic - DNA - Microscope

Microscopic Observations – Cells – Multicellular organisms – Brain and Nerves – Genetics – Evolution – Human Reproduction – DNA

## Plant-Osmosis-Photosynthesis

Plant Life Cycles – Reproduction In Flowering Plants – Plant Growth – Osmosis - Photosynthesis

## Food Chain

Starch in Food – Diet – Nutrient Cycles – Food Chains

## Animals & Humans

Animals Classification – Human: The Human Body – Human Body systems - Human Respiratory system - Virtual Eye and Virtual Ear - Exercise - Skeletal system.

