



## AVAILABLE COLOURS

### MAIN STRUCTURE



**Grey Aluminium**

### PANELS & DRAWERS\*



**Grey**

\* Panels and Drawers in different colours can be available for large quantities on request. For further information, please contact Altay Scientific.

# MOBILE LAB<sup>®</sup>

*Mobile Science Laboratory*

**This is a stand alone system designed for 11-15 years old students and particularly useful for all those educational environments lacking equipped science classrooms.**



## **Specifications**

Size: approx. 92x65x148 cm  
(height/depth/width)

Weight: approx. 180 kg

The cart is completely mobile and has 5 storage drawers, protecting your equipment in shock-free, moulded sponge pods. The drawers pull all of the way out providing safe yet easily accessible storage of your valuable equipment. All equipment are organized by scientific discipline for quick and easy set-up and equipment control. Do all of your science experiments on the acid resistant work surface. The Altay Mobile Science Laboratory is designed for easy access to water, gas and electricity. It is ideal for all teaching environments and its modular design guarantees flexibility and adaptability for all of your science experiments.



## Basic Equipment



◀ Mechanics

Electricity - Thermology - Magnetism ▶



◀ Optics - Acoustic - Accessories



Chemistry ▶



◀ Biology - Accessories



Thanks to the system of removable trays and adaptable foam inserts, the five drawers can be customized to store a large variety of scientific equipment.



◀ Statics



Thermodynamics ▶



◀ Electronics - Electromagnetism



Advanced Optics ▶



◀ Electricity Upgrade



Mechanics Upgrade 1 ▶



◀ Waves and Oscillations



Mechanics Upgrade 2 ▶

## DESCRIPTION AND TECHNICAL SPECIFICATIONS (BASIC MODEL)

**MOBILE LAB®** cart comes with a universal power supply equipped to operate with any user voltage – just connect the cart to an electrical outlet, flip the switch and you are ready to go.

### STRUCTURE AND MATERIALS OF THE CART

The main structure of our **MOBILE LAB®** is made of sturdy, acid-resistant aluminium, while the front, back and side panels of the cart are made in mild steel oven-painted by using special coat resistant to chemicals, scratches and fire.

The top and the cover sink are made in chemical resistant HPL. The sink is acid-resistant polypropylene (approx. height/depth/width 15x30x20 cm), the water tap is in stainless steel and folds down if necessary.

### WATER SUPPLY

- There are 2 tanks made of acid-resistant polyethylene, each with a capacity of 10 litres. One pumps clean water to the tabletop tap; the other works as sewage system and is connected to the sink drain.



### SECURITY SYSTEM

- One portable powder extinguisher (1 kg)
- One first-aid kit
- Three locking systems (left and right doors plus drawers)



### GAS/SPIRIT SUPPLY SYSTEM

- The Laboratory is also provided with two burners: **one supplied by a 240g GPL cylinder and one spirit burner**



## CONTROL & ELECTRIC PANEL

1. One power switch
2. One green LED when main power supply is on
3. One yellow LED when optional power supply is on
4. One water pump button with LED
5. One switching-mode power supply with the following characteristics:
  - Output voltage range: 0 - 12 Vdc
  - Output current range: 0 - 8 A
  - One digital voltmeter and one digital ammeter
  - Max power: 100 W
  - Short circuit and overload protection



**The electric panel includes the following:**

6. One 110/125 VAC socket; 50/60 Hz
7. Two 220/240 VAC socket; 50/60 Hz
8. Additional sockets are included in the back panel of the cart

## HIGH QUALITY WHEELS

- The mobile cart uses zinc plated pressed steel wheels, two with breaks, dia. 12.5 cm maximum static load 150 Kg each, ( 600 kg total).



## POWER CORD SYSTEM

- The cart is provided with a 6 meter re-winding power cord to allow easy access to the nearest electrical source.



***The MOBILE LAB® is supplied with  
Multilingual Instruction Manuals***

***featuring more than 80 EXPERIMENTS and procedures.  
The Manual contains a Teacher guideline for experiments  
setup as well as student work sheets.***



## LIST OF EXPERIMENTS YOU CAN PERFORM WITH THE BASIC ALTAY MOBILE LAB®

### BIOLOGY

#### Plant Physiology Experiments

- Capillarity – the stem
- Cell turgor practical implications
- Chromatography
- Osmosis
- Osmosis in cells
- Osmosis in potatoes
- Osmosis in potatoes: effects of the concentration
- Osmosis in roots
- Oxygen in water
- Pollen germination
- Starch in leaves
- The pulp of fruits

### CHEMISTRY

#### Experiments of General Chemistry

- Accumulators
- Acid base reactions
- Carbon dioxide properties
- Carbon dioxide production
- Colloids and properties of colloids
- Conductivity and concentration
- Conservation of matter
- Coordination complexes
- Corrosion and cathodic protection
- Daniell cell
- Diffusion in solution
- Displacement (single exchange) reactions
- Effect of temperature on solubility
- Electrolytes and conductivity
- Electrolytic processes
- Enthalpy of neutralization
- Enthalpy of crystallization
- Hydrogen production
- Iodine sublimation
- Lemon cell: an unusual source of electric current
- Melting of sulphur
- Oxygen production and oxygen properties
- Properties of hydrogen
- Salt solution cell
- Sodium carbonate and sodium bicarbonate
- Volta cell
- Water electrolysis
- Water electrolysis basic environment
- Water of crystallization
- Density of substances

### PHYSICS

#### Mechanics

- Analytical balance and investigation of



- weight as a force
- Belt drive systems
- Communicating vessels
- Composition, decomposition and transmission of forces including the parallelogram law
- Hooke's law
- Inclined plane and friction
- Kinetic and potential energy
- Levers: including first, second and third class type
- Measurement of a length, concept of experimental error
- Pulleys: including fixed, mobile and differential pulleys
- Simple pendulum and spring pendulum

#### Heat

- Equilibrium temperature of mixed liquids
- Heat capacity of the calorimeter
- Heat sensitivity and thermal equilibrium
- Specific heat capacity of solid and liquid bodies
- Thermometer's time constant
- Solidification's temperature of paraffin

#### Acoustics

- Beats
- Interference
- Resonance
- Use of the tuning forks

#### Optics

- Focal length

- Investigating mixing of colours
- Lenses laws
- Magnifier
- Microscope - telescope
- Mirrors
- Prism: composition of light
- Reflection and Refraction laws
- Shadow and penumbra
- System of lenses
- The eye
- Thin lens equation

#### Magnetism

- Attractive and repulsive magnetic forces
- 2D magnetic field viewer

#### Electricity

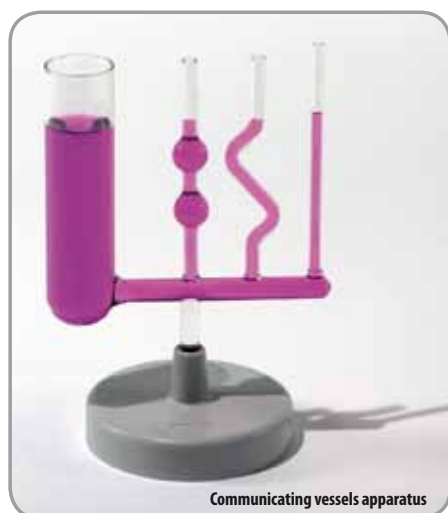
- Electric resistance
- Ohm's law
- Series versus Parallel circuits

**YOU WILL FIND FULL SPECIFICATIONS OF SUPPLIED PRODUCTS FOR THE MOBILE LAB® IN OUR BIOLOGY AND SCIENCE EDUCATIONAL SYSTEMS AND APPLIANCES CATALOGUES**

## ALL THE FOLLOWING ITEMS ARE INCLUDED IN OUR BASIC MOBILE LABORATORY

CODE	DESCRIPTION	Q.TY	CODE	DESCRIPTION	Q.TY	CODE	DESCRIPTION	Q.TY
<b>MECHANICS</b>								
1226.15	Cylinder graduated, tall form with spout. Capacity 100 x 1 ml, borosilicate glass	1	4110.81	Steel Spring with Pointer (diameter 0.75 mm, diameter 21 mm x 150 mm length)	2	 <p>Assembled analytical balance</p>		
2208.20	Double Side Scale, silk screen printed	1	4111.08	Cylindrical Mass with Hook (total 10 g)	5			
			4111.10	Cylindrical Mass with Hook (total 25 g)	8			
			4111.12	Cylindrical Mass with Hook (total 50 g)	4			
			4111.51	Slotted Mass 10 g	5			
			4111.56	Mass Hanger 10 g	1			
			4112.05	Pulley for Inclined Plane	1			
			4112.10	Pulley with Hook	2			
			4112.24	Triple pulley in Axis	1			
			4112.30	Triple pulley in Line	1			
			4112.40	Differential Pulley (30, 60 and 90 mm diameters)	1	4861.10-027	Brass Hook M3. 3 x 40 mm (diameter x length)	7
			4112.42	Differential Pulley with Two Handles (40, 80 and 120 mm diameters)	1	4861.10-029	Balance Hook	2
			4112.45	Axle with Fixing screw for Differential Pulley	2	4861.10-030	Rubber Band	2
			4113.20	Polyester inelastic String diameter 0.8 mm, length 10 m	1	5401.20	Metallic Bosshead 20 x 20 x 40 mm with knobs	2
			4113.27	Scale Pan Hooked with metal suspension	2	5401.22	Bosshead PVC 20 x 20 x 60 mm with blue knobs	3
			4113.35	"S" Hook, length 30 mm approx.	2	5401.60	Suspension Ring with Knob	1
			4113.50	Rod with Clip	2	5408.81.L350	Support Rod length 350 mm	2
			4113.53	Rod with hook diameter 10 mm, length 127 mm	2	5408.81.L500	Support Rod length 500 mm	3
			4113.54	Red Pointer with Clip	1	5408.91	Multi-function Support Rod, rounded ends, with holes length 350 mm	1
			4114.13	Lever Holed Rod with pair of threaded cylinders	1	5491.11	Inclined plane, with 3 different track terminals	1
			4114.71	Friction Block	1	DGAKNB. M4X10	Knob (Inox Blue M4 x 10 mm)	1
			4114.80-011	Hook for Cart	1	2231.52	Digital chronometer	1
			4114.82	Cart for Inclined Plane	1	4180.60	Communicating vessel	1
			4861.10-020	Rod with cylinder diameter 3 mm, length 72.5 mm	1	4207.56	Food Colouring	1
			4861.10-021	Rod with threaded stem M3 diameter 8 mm, length 70 mm	1	5405.30	Base for capillary tube and communicating vessel	1
			4861.10-024	Metallic Ring diameter 20 mm	1			
			4861.10-026	Brass Hook M3, 3 x 50 mm (diameter x length)	2			





Communicating vessels apparatus

## HEAT

1118.20	Beaker low form 100 ml, borosilicate glass	2
1118.35	Beaker low form 250 ml, borosilicate glass	2
1118.50	Beaker low form 500 ml, borosilicate glass	2
1274.00	Drying Tube, U shape. Length x diameter 100 x 13mm, borosilicate glass	1
2240.15	Thermometer -10°/+110°C	1
4200.95	Set of Two Cylinders in stainless steel	1
4210.50	Pulse Glass, Balls 40 mm Length 130 mm	1
4230.71	Mixing Calorimeter	1
4230.96	Specific Heat Cylinders	1
5416.20	Extension Clamp with Rod	2
5424.52	Grease Silicon for Glassware	1
5424.53	Paraffin Blocks	1
5449.25. L2000	Silicone tubing, Bore 7 mm, Outside diameter 10 mm, 2000 mm length	1
5450.23	Rubber stopper, top diameter x bottom diameter x length approx. 7 x 3.8 x 19.4 mm	1
5450.38	Rubber stopper, top diameter x bottom diameter approx. 22 x 16 mm. Diameter of hole approx. 6 mm	1
5450.42	One-hole rubber stopper, top diameter x bottom diameter approx. 38x33 mm. Diameter of hole approx. 5 mm	1
5533.10	Tripod Stand	1
5534.25	Wire Gauze, with Round Ceramic Centre	2

## OPTICS

4402.30	Ray Optics and Colour mixing Box with Accessories	1
4402.35	Base support for Ray Optics Box	1
4414.02	Holder for 50 mm diameter Lenses and Mirrors	4
4414.12	Set of Seven Diaphragms	1
4414.03	Holder for Slides and Diaphragms	1
4414.18	Projector with 12V 20W Halogen Lamp	1
4414.19	Halogen Lamp 12V 20W	2
4417.01	Slider for Holder	6
4417.17	Slider for Projector	1
4418.29	Prism table	1
4418.35	White Metal Screen, squared 140 mm, 10 mm diameter support	1
4419.01	Hartl Disc, Matt White Face Graduated in Degrees, on stem	1
4419.06	Biconvex Lens for Hartl Disc f= +85 mm	1
4419.07	Biconvex Lens for Hartl Disc f= +135 mm	1
4419.08	Biconcave Lens for Hartl Disc f= -135 mm	1
4419.11	Deformable Mirror for Hartl Disc	1
4419.12	Plane Mirror for Hartl Disc	1
4419.13	Refraction Index Vessel for Hartl Disc. 60 mm diameter	1
4431.00	Set of 4 Concave Spherical Mirrors f: -5, -10, -15, -20 cm	1
4435.00	Set of 4 Convex Spherical Mirrors f: 5, 10, 15, 20 cm	1
4441.00	Set of 4 Biconcave Spherical Lenses f: -5, -10, -15, -20 cm	1

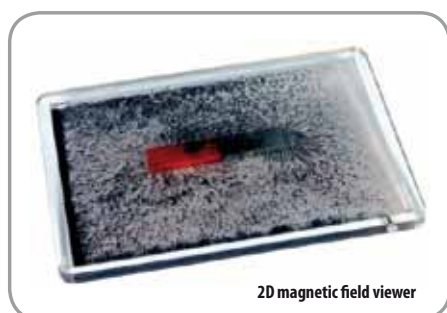
4445.00	Set of 4 Biconvex Spherical Lenses f: 5, 10, 15, 20 cm	1
4450.10	Equilateral Glass Prism Side 25 mm	1

## ACOUSTICS

4317.40	Pair of La tuning forks	1
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## MAGNETISM

4611.10	Magnetic Field Chamber 2D	1
4611.40	Plastic Cased Bar Magnets	10
4611.71	U-Shaped Magnet (with Keeper)	1



2D magnetic field viewer

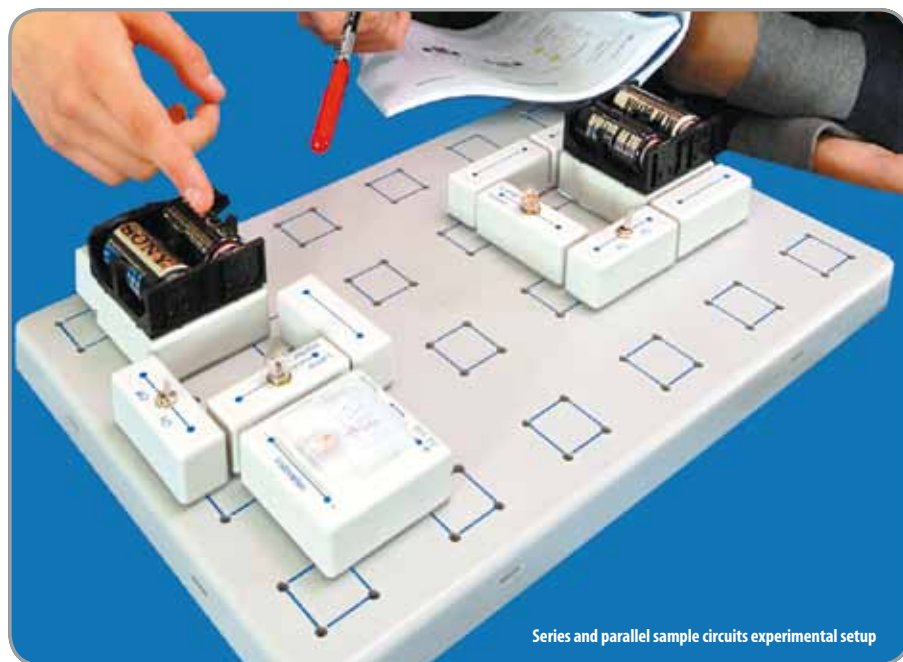
4611.72	Horseshoe Magnet (with Keeper) flat - 100 mm	1
4612.12	Iron Filings (package of 200 g)	1
4614.50	Demonstration Compass	1

## ELECTRICITY

2275.10	Digital Multimeter	1
2505.61	Bulb Lamp 2.8V	4
2505.64	Bulb Lamp 6V	4
2505.65	Bulb Lamp 12V 2W	4



Example of image formation in converging lenses



Series and parallel sample circuits experimental setup

2522.02	Stackable Plug Lead, 25 cm, Red colour, Plug 4 mm	2	1118.15	Beaker low form 50 ml, borosilicate glass	2
2522.03	Stackable Plug Lead, 50 cm, Red colour, Plug 4 mm	1	1226.00	Graduated cylinder, tall form with spout, capacity 10 ml borosilicate glass	1
2522.07	Stackable Plug Lead, 25 cm, Black colour, Plug 4 mm	2	1276.10	Drying tube U shape with side tubes	1
2522.08	Stackable Plug Lead, 50 cm, Black colour, Plug 4 mm	1	1322.10	Conical flask, wide mouth, capacity 150 ml, borosilicate glass	1
2531.52	Crocodile clips	10	1322.20	Conical flask, wide mouth, capacity 250 ml, borosilicate glass	1
4762.02	Boards for Electricity and Electronics Circuits	1	1337.15	Volumetric flask, polyethylene stopper, capacity 100 ml, borosilicate glass	1
4762.20	Bridging Plugs (2 plugs)	4	1359.00	Separating funnel	1
4762.28	Two Cell Holder	2	1436.36	Graduated pipette, class B zero at the top, capacity 1 ml borosilicate glass	1
4762.36	Lamp Holder	4	1436.40	Graduated pipette, class B zero at the top, capacity 5 ml borosilicate glass	1
4762.60	Voltmeter 0-15 V and 0-1.5 V	1	1468.07	Right angle bent glass tube connector outer diameter x length approx. 6 mm x 65mm	1
4762.70	Push Button Switch (2 plugs)	1	1920.15	Porcelain evaporating dish, round bottom, capacity 50 ml	1
4762.72	Toggle Switch, Single Pole (2 plugs)	1	2162.16	Vinyl gloves, pack of 40	1
4763.18	Resistor 100 ohm 2W (2 plugs)	4	2148.25	Safety goggles	5
4763.20	Resistor 220 ohm 2W (2 plugs)	2	2219.30	Electronic Balance 300 g/readability 0.01 g	1
4763.24	Resistor 470 ohm 2W (2 plugs)	2	4716.12	Platinum electrode	2
4763.26	Resistor 1 kohm 2W (2 plugs)	2	4716.16	Zinc electrode	4
4763.32	Resistor 4.7 kohm 2W (2 plugs)	2	4716.21	Copper electrode	4
4763.34	Resistor 10 kohm 2W (2 plugs)	2			
<b>GENERAL CHEMISTRY</b>					
0001.40	32 Chemical Reagents Set	1			

4716.23	Iron electrode	4
4716.24	Lead electrode	4
4718.10	Test cells cover	2
5514.10	Alcohol Burner	1
5448.10	3 way rubber pump red rubber	1
5450.08	Rubber stopper for test tube 21x150mm	6
5450.10	Rubber stopper for conical flask 150ml	1
5450.11	Rubber stopper for conical flask 250ml	1
5450.71	Two-hole rubber stopper for conical flask 250ml	1
5450.72	One-hole rubber stopper for test tubes	1
5450.74	One-hole rubber stopper for conical flask 250ml	1
5450.79	One-hole rubber stopper for conical flask 150ml	1
5450.80	Two-hole rubber stopper for conical flask 150ml	1



Model of Atoms

5453.20	Cork stopper for test tubes	1
5535.04	Triangle for crucibles, length of one side approx. 60 mm	1
7601.15	Model of Atoms	1
8340.08	Round filter paper	1
8884.02	Litmus paper Universal pH 0-14	1
<b>PLANT PHYSIOLOGY</b>		
1253.00	Glass Petri Dish diameter 60 mm	3
1343.15	Funnel, short stem, diameter 75 mm, borosilicate glass	1
1441.50	Dropping pipette, Pasteur type, neutral glass, length approx. 150 mm	5
1444.10	Stirring rod, glass, diameter x length approx. 5 x 250 mm	3



Beaker, low form 250 ml

1464.51	Large glass tube diameter x length approx. 34 x 190 mm	1
1468.02	Straight glass delivery tube outer diameter x length approx. 6 x 70 mm	1
1473.60	Test Tube with rim, diameter x length 21 x 150 mm	6
1489.05	Watch Glass diameter 60 mm	2
1489.15	Watch Glass diameter 80 mm	2
1640.50	Funnel for powder, polypropylene, diameter approx. 66 mm	1
1646.00	Laboratory film Parafilm	1
1680.06	Plastic Test Tube Rack for 6 Tubes Mountable diameter 20 mm length 240 mm	1
1951.05	Porcelain mortar with pestle, diameter approx. 80 mm	1
4182.61	Double Osmotic membrane	1
4182.62	Osmotic pressure apparatus - graduated	1
5401.16	Right Angle Clamp Metal	2
5404.52	Iron Stand, Mountable Blue Base with Support Rod	1
5423.30	Hardwood Test Tube Holder	1
5431.05	Mohr clip steel	1



Spatula Double ended

5448.00	Nipple for dropping pipettes	1
5449.43m	Connections for Glass Tube Transparent Silicone Rubber	1
5450.12	Rubber stopper for Large Glass Tube	1
5450.75	One-hole rubber stopper for large test tubes	1
5453.82	Cork borer set	1

5460.34	Double ended steel spatula	1
8261.30	Metal tweezers	1
8262.02	Scalpel	1
8349.20	Square filter paper	1

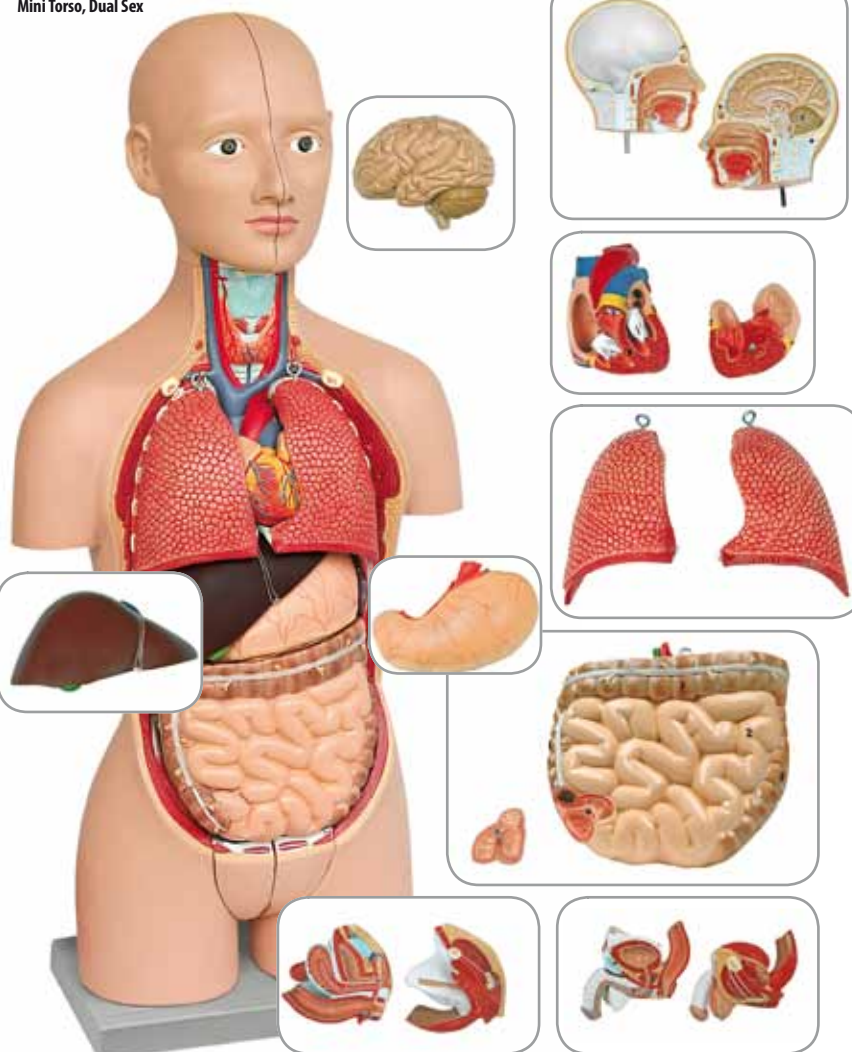
## BIOLOGY EQUIPMENT

1388.00	Microscope slides, precleaned, with flat surface and smooth edge, dimensions approx. 76x26 mm in 50 pieces box	5
1397.05	Cover glass, precleaned Dimension approx. 20 x 20 mm in 100 pieces box	5
6000.33	Mini Torso, Dual Sex (Caucasian Type) 16 Parts (Other type on request)	1
7000.02	Prepared microscope slide set, Extensive Biology (24 slides)	1
7000.05	Microscope slide set, Insect anatomy, (25 slides)	1



Microscope model BVH310

Mini Torso, Dual Sex



## UPGRADES AND OPTIONAL EQUIPMENT

Beside the basic laboratory, additional carts are also available to provide the needed level of support for interactive hands-on learning for **ANY** program, **ANY** demand, **ANY** curriculum.

Altay has now developed the perfect integrated solution to run Physics, Natural Science and Chemistry classes from middle schools to university level.



Physics Upgrade

Name	Code
Physics Upgrade	4916.10
Chemistry Upgrade	4916.20
Natural Science Upgrade	4916.30

Physics Upgrade

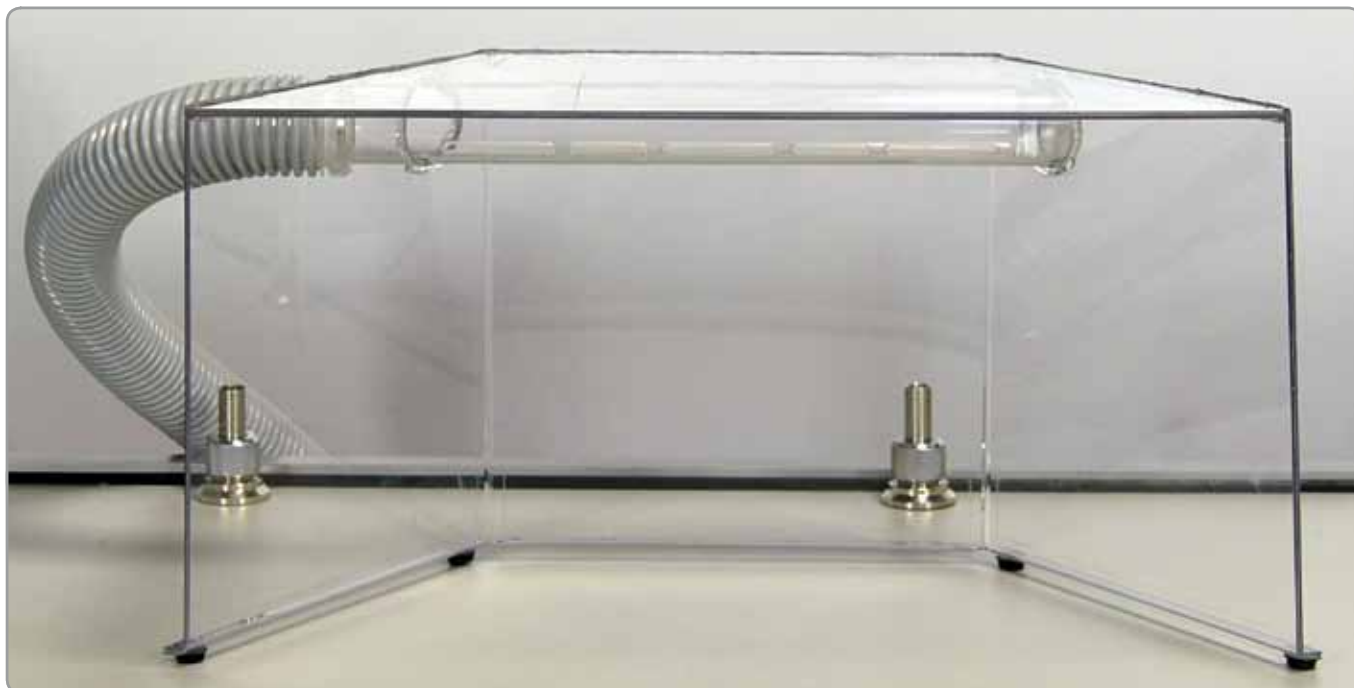


gives **YOU** the possibility to fill the racks with the equipment you need and create a fully **CUSTOMIZABLE** range of upgrades by simply replacing trays and their contents.

Teachers and students can now start performing new experiments and demonstrations.

## ADDITIONAL FEATURES FOR ALTAY'S MOBILE LAB

**The Mini Portable Fume Hood (code 4907.00) is the ideal stand alone solution to perform simple chemistry experiments with didactic chemicals.**

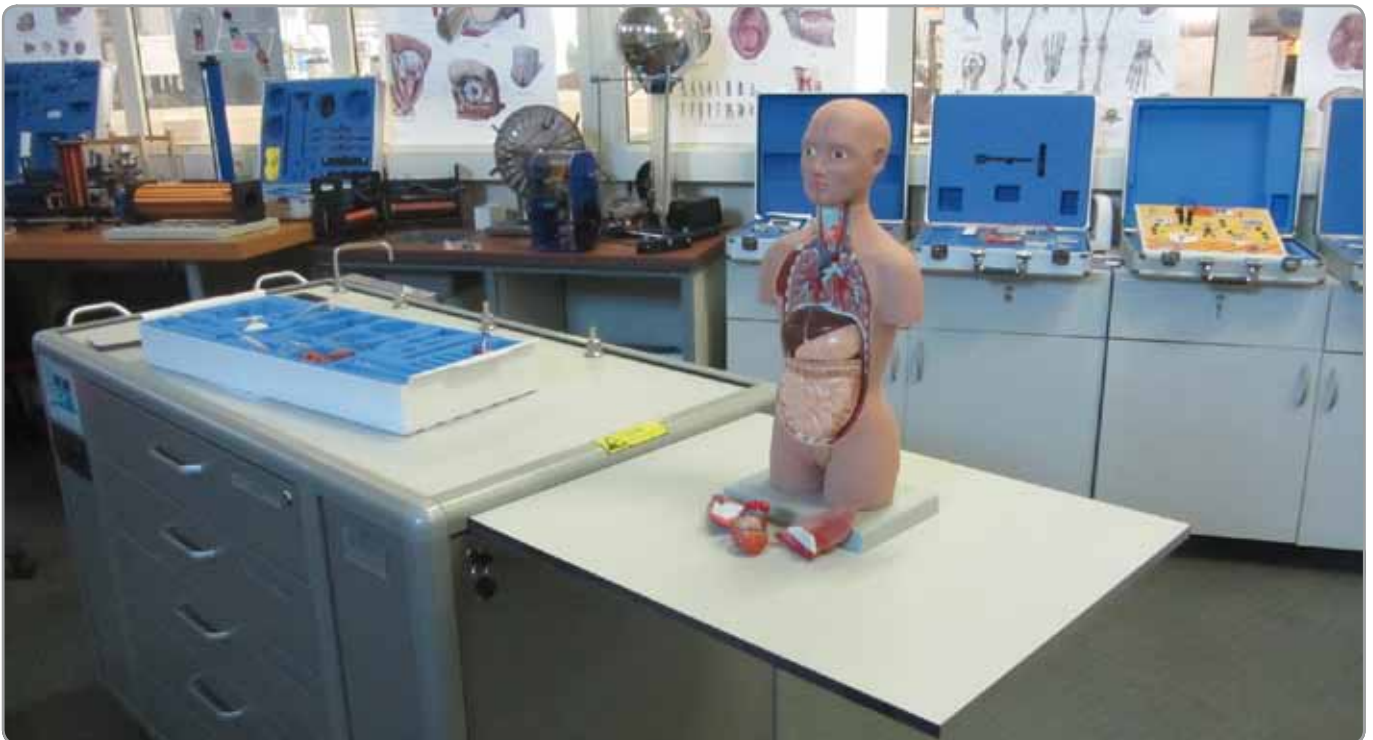


The air is sucked in and channeled through an activated carbon filter box than cleans it before feeding it back to the Laboratory or classroom. This recirculation system is extremely practical and cost effective because it needs no fitting of external ductwork on the walls of the school building.

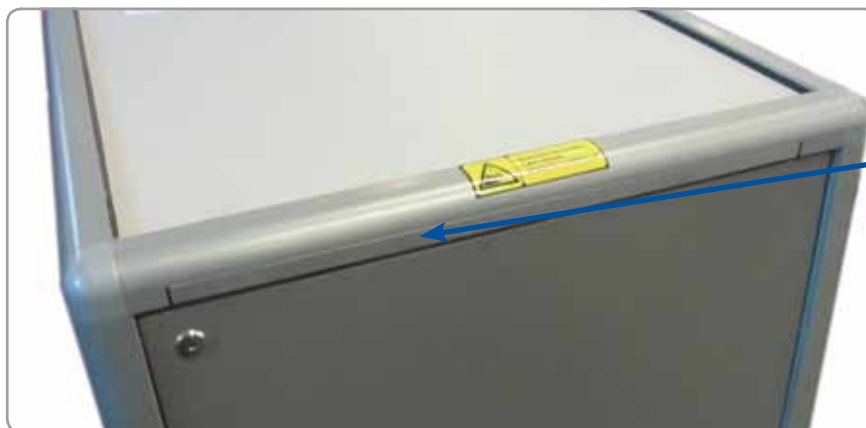


To use it, just place it on the worktop, connect the pipe to the rear side of the Mobile Lab and turn on the switch.

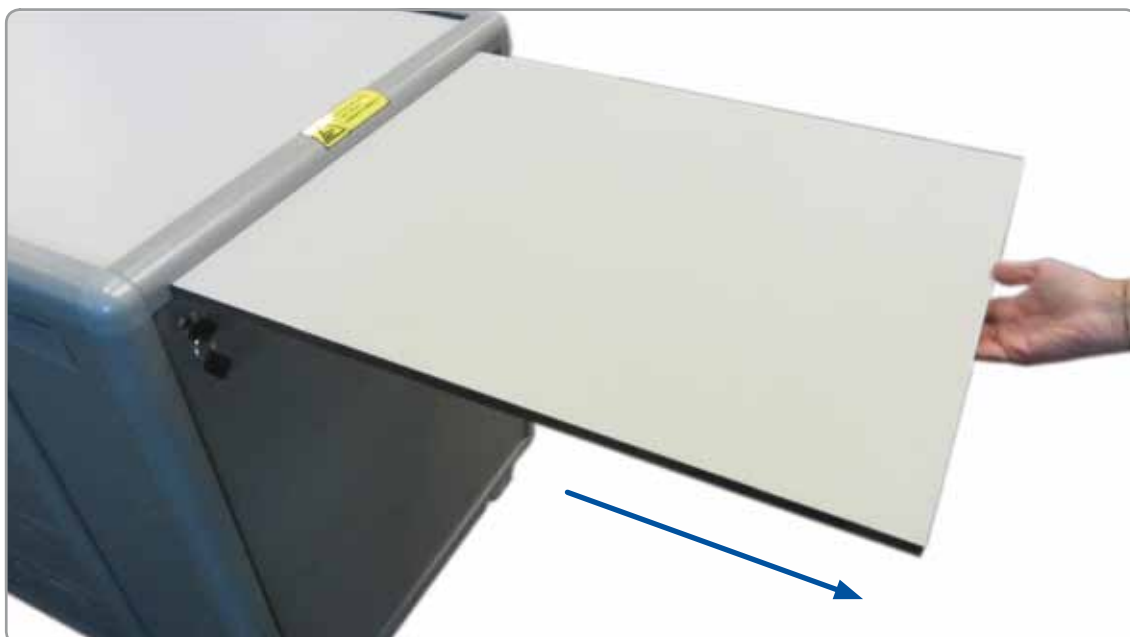
In order to increase the work area it is possible to equip the mobile lab with an additional **Extension Plane** (code 4906.00) with the dimensions of 50 x 60 cm in HPL material.



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*Extension Plane*

Simply open the door and pull out the sliding plane to obtain a wider and more effective working area for your experiments.



**Multimedia System (code 4905.00) is also available.  
The perfect solution for classroom presentations.**

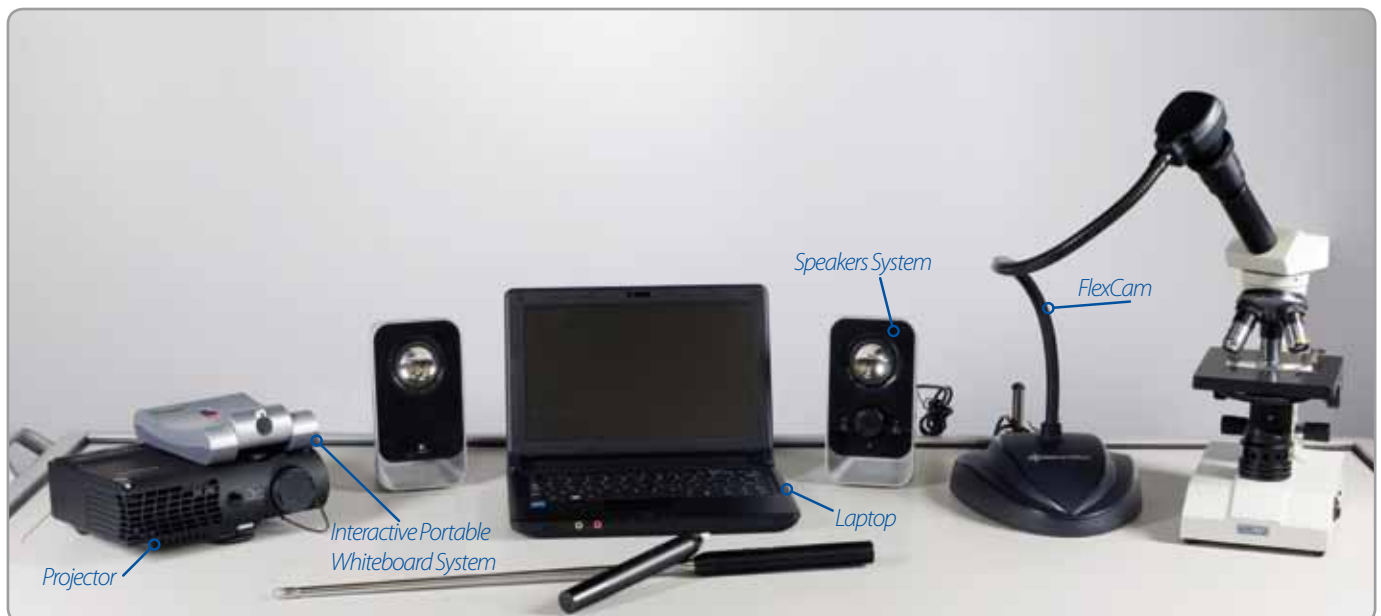


#### It includes:

- Interactive Portable Whiteboard System + Accessories
- Projector
- Laptop
- Projector & Laptop Holder
- Speakers System
- Flexcam

#### Interactive Portable Whiteboard System+ Accessories

- Ultra portable and simple setup
- Superior resistance to ambient lighting
- High resolution - smooth drawing within 1 pixels' jitter at 1024x768
- Quick response time - ideal for drawing and writing
- Dual connection interfaces provided: USB and COM ports
- Lower power consumption
- No device/cable attached to whiteboard/projector surface
- Supports interactivity on both hard and soft screen of any size up to 150"
- Extendable Pointer E-Pen and Stylus  
E-Pen provide an intuitive and powerful "touchscreen" and annotating interface
- Streamlined designed - easy to mount on both desktop and ceiling
- Automatic real-time whiteboard recording
- Supports soft-pen effect writing, spotlight screen shade features.



## Multimedia Holders

As an alternative, Altay offers you the possibility to set up your own multimedia system. We provide you with some height adjustable orienting shelves, the Multimedia Holders (code 4900.25) and you will gain the choice of selecting the material to place on.



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Top View



Bottom View



◀ Example of use

