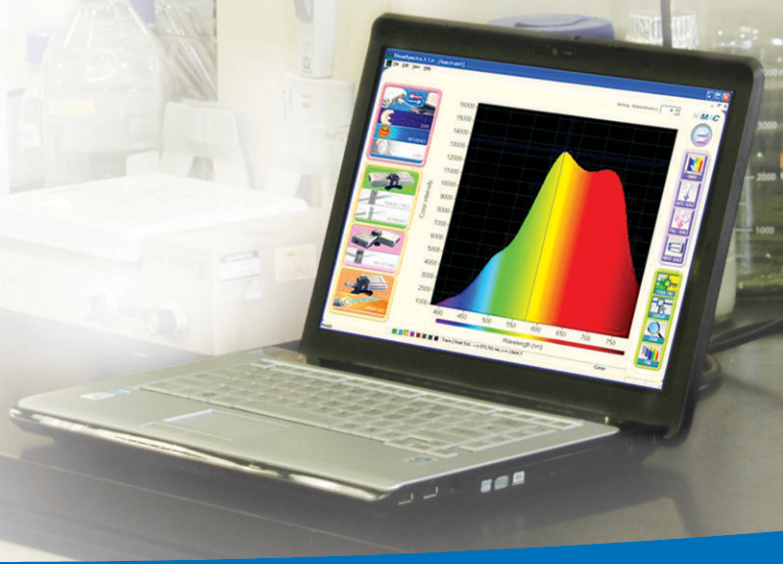
Educational Spectrometer

Lab Junior



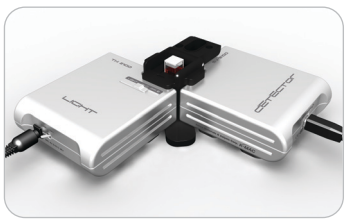
K-MAC
Korea Materials & Analysis Corp.

Lab Junior

Optical experiment kit for education!

- 3 Modes in One system : Absorbance/Transmittance mode, Fluorescence/Reflectance mode, Irradiance mode
- Module based compact design
- All in one kit for various experiments
- Intuitive & Easy to use S/W
- Learning contents & Virtual experiments

Different Measurement Modes with Different Layouts

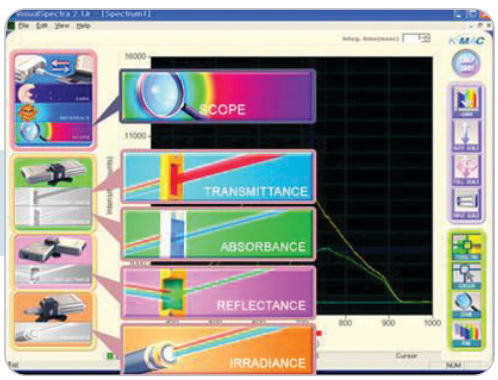
Absorbance/Transmittance Mode	Fluorescence/Reflectance Mode	Irradiance Mode
		

Optical experiment kit about light, color and wavelength

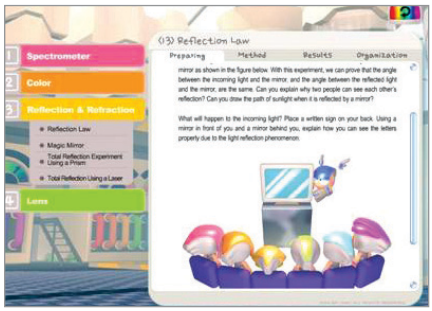
Optical experiment is ready only with Lab Junior Kit itself without any additional preparation.

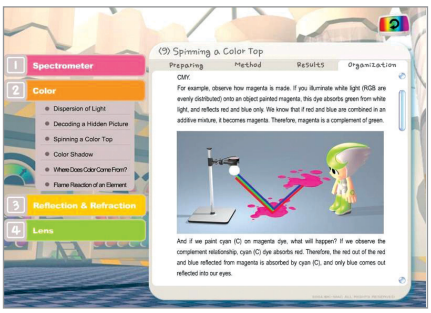
User-friendly interface program

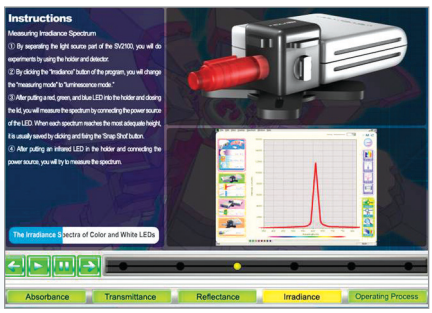
Various colors and 3D pictures makes it easy and interesting for students to use the program.



Rainbow program provides effective education for principle of light, spectroscopy experiments and virtual experiments.







It is possible to understand and conduct various experiments of the interaction between light and objects around us by means of Lab Junior.

The Official experiment kit of 38th International Chemistry Olympiad

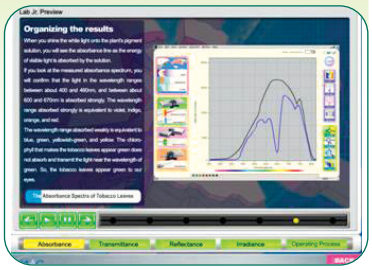
Lab Junior was selected to test for the young talented students around the world at the 2006 International Chemistry Olympiad.

Easy connection to PC via USB 2.0

Experiments

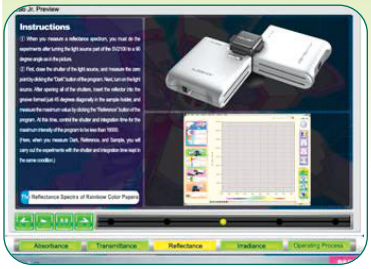
Absorbance/Transmittance Mode

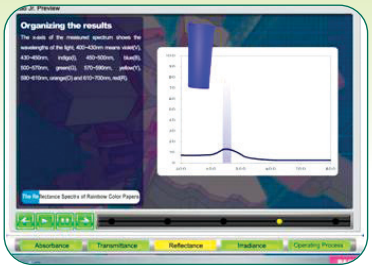
Experiments on absorbance and transmittance of colors using color filter
Experiments on wavelength of colors
Experiments on determining the concentration of a solution (Beer's Law)
Measuring experiments on chlorophyll of tobacco leaves



Fluorescence/Reflectance Mode

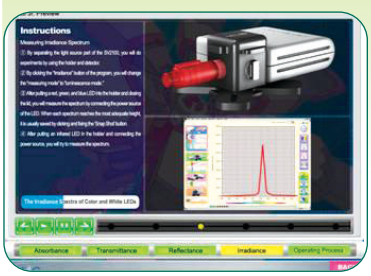
Experiments on comparing surface roughness of reflective materials
Experiments on comparing reflectance of reflective materials
Experiments on determining the concentration of fluorescent materials

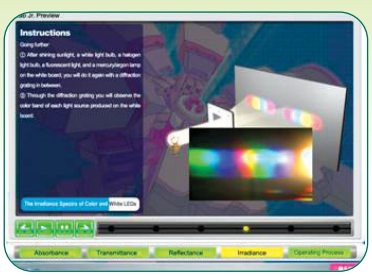


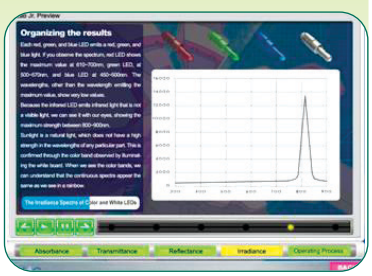


Irradiance Mode

Experiments on observing flame coloration of element
Experiments on composition of light by means of LED light source
Experiments on wavelength position by color



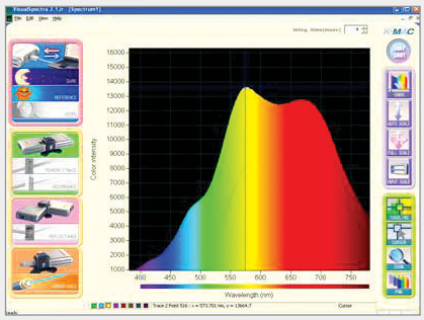


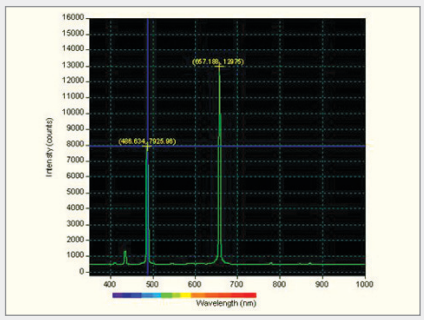


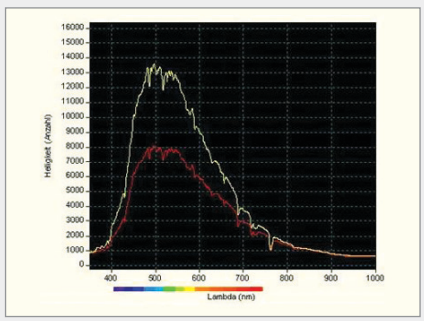
Application

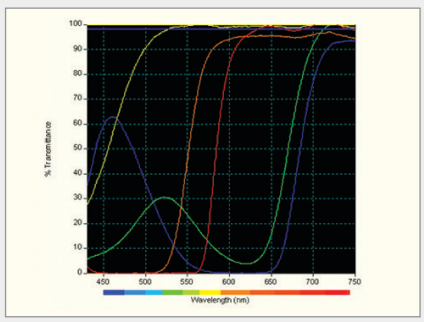
Chemistry

- Spectrum of admixture & combination
- Absorbance& transmittance of light
- Beer's law and calibration curve
- Color mixed solution analysis
- pKa of Indicator
- Ethonal quantitative analysis
- Linear spectrum of hydrogen
- Fluorescence spectrum









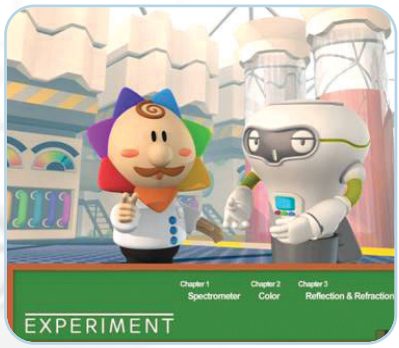
Physics

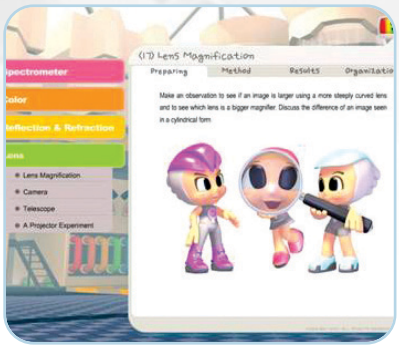
- Total Reflection Experiment Using a Prism
- Color chromatography Separation &Analysis
- Concave mirror
- Convex lens
- Photoelectric effect
- Total reflection
- Reflection Law
- Lens Magnification

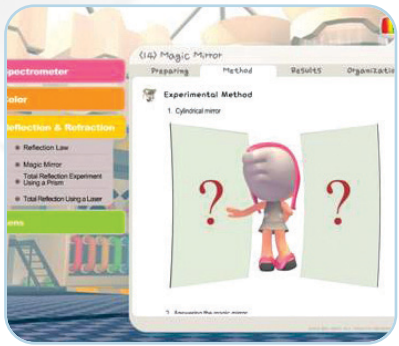
Biology

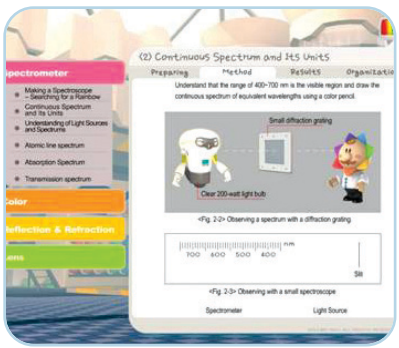
- Enzyme Acitivity
- Protein extraction and assay
- Bacteria growth
- DNA, RNA assay

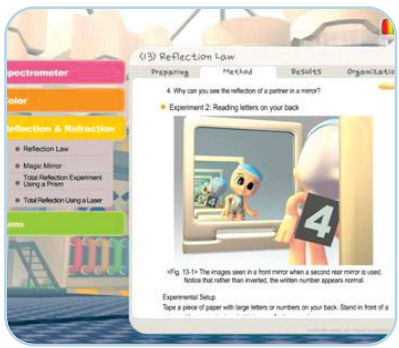
Learning Contents



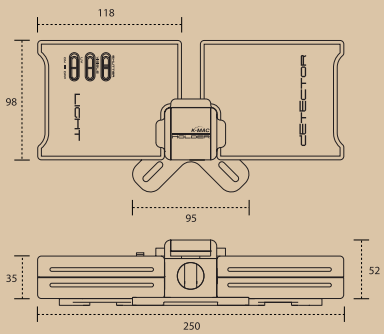








Specification



Optical Bench

Spectral range	400 ㎚ ~ 1000 ㎚ (Tungsten Halogen lamp)
Resolution FWHM	2.3 ± 0.2 ㎚ (standard slit)
Wavelength accuracy	± 0.46 ㎚ (standard slit)
Sensitivity	Range: 0.0 ~ 3.0 Abs, 0.0 ~ 125%
	Accuracy: 〈 1% at 1 Abs, 4×10^{-3} Abs
Straylight	Dark noise 〈 2 mAbs, 30 Counts/16383 counts
	〈 0.05% at 600 ㎚ 〈 0.10% at 435 ㎚

Lab Junior Components

Everything is ready to start the experiment in one kit

: Detector, Light Source, Sample holder, Software and Accessories.


Transmission Cellophane Paper


Reflection Color Paper


LED light sources


Cuvette Cell


Grating


Light source holder

Accessory

- USB cable
- Driver CD
- Adaptor
- Cuvette Cell
- Color Paper Box
- Reflection Color Paper
- Transmission Cellophane Paper
- LED light sources
- Grating
- Light source holder
- Hexagonal Wrench
- Transport case
- Manual

Detector

Number of pixels	2048 elements
Maximum clock rate	2 MHz
Current consumption	10 mA
Supply voltage	5 V
Integration time	1 ms ~ 60 sec
Effective range	350 ㎚ ~ 1080 ㎚

Light Source

Spectral range	400 ㎚ ~ 850 ㎚
Power input	9V DC/500mA
Color temp	2,800 K
Bulb lifetime	1,500 hours
Bulb output	70 Lumens
Connector	SMA 905

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