

STRATLAB

— LABORATORY SUPPLIES —

Information-instruction sheet, Stratlab mug and spectrometer in a box

Information:

This is a small spectrometer kit that can be assembled step-by-step.

It is able to show the basics of a spectroscopy and how light is made up of many different wavelengths.

It can educate students how a spectrometer works. They can assemble it so understanding the features of each part.

The spectrometer could be used to examine different solutions to see how they affect the spectrum of light. It can be used as an example when explaining how unknown substances might be identified using spectroscopy and/or quantities assessed.

The box is tagged with an NFC tag. To use this, first download NFC tools to your smartphone from your Apps store. e.g.

<https://nfc-tools.en.uptodown.com/android>

This free download, once installed, can be used to link the product to the relevant page on the Stratlab website. (Other links may follow).

[http://www.stratlab.co.uk/product_detail/
spectrometer_kit_in_a_box_with_a_mug/108977/225](http://www.stratlab.co.uk/product_detail/spectrometer_kit_in_a_box_with_a_mug/108977/225)

The box also contains a useful Stratlab mug.

Equipment included:

White transportation box, 15x13x11.5cm which is also used as the spectrometer housing

Stratlab mug

Section of a clear CD

3 cuvettes

NFC tag

Equipment not included:

Torch (preferably LED what can be focused)

Sharp knife or scissors

A small amount of sticky tape or Blu Tack or similar material

Smart phone can be used as a detector

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Method:

1. Take out the contents of box
2. Cut out the small square at the front of the box (where shown). This will be the eyepiece.
3. Cut a line at the back of the box (where shown). This will be the spectrometer's slit.
4. Put the part of the CD inside so that it covers the hole. The plastic section can be placed against the inner wall of the box such that it covers the viewing hole and is held in place by inner cardboard flaps. Use sticky tape or Blu Tack to further secure if necessary ensuring the rectangular hole is not obscured by the tape or Blu Tack, and ensuring that the plastic section is flat against the viewing hole.
5. Close the top of the box, tucking in the first two side-flaps. Leave the final carton flap un-tucked. When looking through the eyepiece, the final flap should rest on the viewer's head, making the spectra clearer through the viewing hole.
6. Point the spectrometer's slit at a light source or point a light source at the spectrometer. Make sure not to look at the light direct but via the viewing hole into the box. You should see 'white light' spectra (from reds through to violet colours) appear.

Set up for sample testing: (complete steps above first)

- Make sure the spectrometer is standing upright and on a flat surface
- Place a sample of lightly coloured liquid into the cuvette eg food colouring, dilute fruit drink
- Place the cuvette in the front of the slit against the inside of the box in the gap between the inner (tucked in) flaps
- Ensure the cuvette stays in an upright position by adding tape across the gap between the tucked in flaps. Alternatively place a small amount of Blu Tack on the base of the cuvette
- Close the box
- Point a light source at the slit
- Look through the eyepiece to see the spectrum and note any changes compared to the 'white light' spectra.

Possible improvements:

Are there ways that this spectrometer could be improved?

What could be used as a grating instead of the section of CD?

Can the light source be better controlled instead of pointing it at the slit?

Is there a way to record results in numbers?

Can it be made into a digital spectrometer?

What about calibration?

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