

## Make Your Own Spectroscope

**Instructions:** Make a “rainbow in a box” using card and a CD.

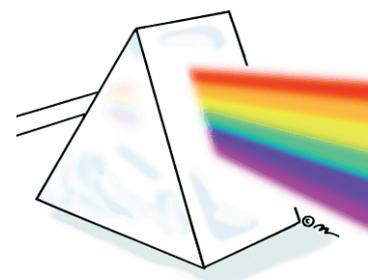


The most useful part of the spectrum for Solar scientists is **visible light** (the light we can see) as it has enough energy and all of it reaches the Earth's surface.

Solar cells and panels are good at turning **visible light energy** into **electricity** so we want to capture as much of it as possible.

## Visible Light

Visible light can be split up into all the colours of the rainbow. When you see a rainbow in the sky, the visible light from the sun is split up by the raindrops in the air. We can also use **prisms** or things called **diffraction gratings** to split the light up too.



In solar cells, we use **coloured materials** like dyes and polymers to absorb the different colours of the rainbow in order to make electricity from the sun.

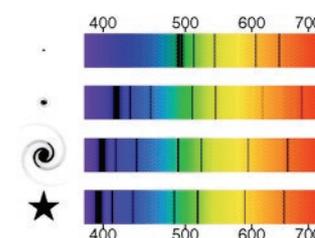
## Spectroscopy in Science

The way that the Electromagnetic Spectrum interacts with matter is called Spectroscopy. We use special spectrometers in science to find out lots of things about everything around us

### Astronomy

Astrophysicists

use spectroscopy to find out what stars are made of and how galaxies move by studying the light they emit into space.



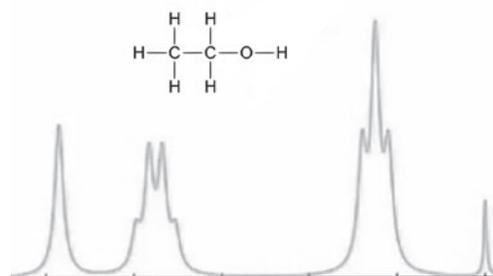
<sup>1</sup>Image from <http://cosmology.com/BigBang4.html>

### Chemistry

New chemical compounds are identified using spectroscopy to find out what elements they are made of.

Solar scientists use spectroscopy to investigate new dyes and materials for solar cells.

NMR Spectroscopy of ethanol (alcohol)



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1

Make your own spectroscope

1. Glue this template onto an A4 piece of card.
2. Cut along all the solid black lines with scissors, including line **a**, and cut out the rectangles **b** and **c** (it's a bit tricky!).
3. Fold along all the dotted black lines.
4. Make the template into a box by joining the same numbered flaps together, e.g. 1 joins to 1.

2

3

**a**

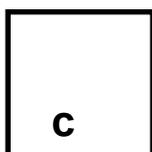


**b**

5. Put a CD into the box through the slot you made at line **a** with the bottom "rainbowy" side of the CD facing upwards.
6. Look into the box through the square hole and you should be able to see light split into a rainbow.
7. Try looking at different types and colours of light and see what changes in your spectroscope.

2

3



**c**

1