# Colours

Scientists classify the light given off from the Sun and standard light bulbs as *white light*. We can't actually see white light. White light is made up of a whole range (or spectrum) of colours, mixed together.

We can see this spectrum if we pass white light through a glass prism (a triangular glass block). This rainbow of colours is called the '*visible spectrum*'. The visible spectrum contains the colours red, orange, yellow, green, blue, indigo and violet. The colours of the light spectrum are easy to remember if you recall ROYGBIV.

The reason white light splits into the colours of the spectrum is because each colour is refracted (or bent) at slightly different angles as is passes from air to glass.

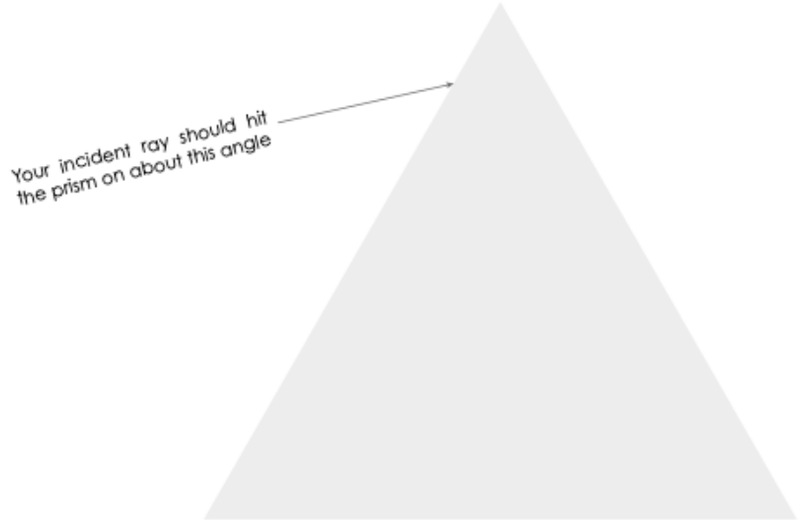
## Separating Colours

**Aim:** To separate white light into the colours of the visible spectrum.

**Equipment:** Ray box, single-slit ray slide, power source, prism.

**Method:**

1. Set up a ray box with a single slit ray slide.
2. Place a glass prism over the area indicated below.
3. Aim the single beam at the prism, ensuring that the beam of light is hitting the prism on a steep angle as indicated by the arrow on the diagram. You may need to adjust it slightly in order to get the spectrum to appear.
4. Complete the diagram by drawing the rays of coloured light exiting the prism. You should use coloured pencils to do this.




1. What colour is the incident ray? _____
2. Where have all the colours come from? _____
3. What does this tell you about white light? _____

   _____
4. What's another word for '*refracted*'? _____
5. State the colour that was (a) Refracted the most by the prism. _____

   (b) Refracted the least by the prism. _____
6. Explain why the prism caused white light to separate into the colours of the spectrum.

   _____

   _____

   _____

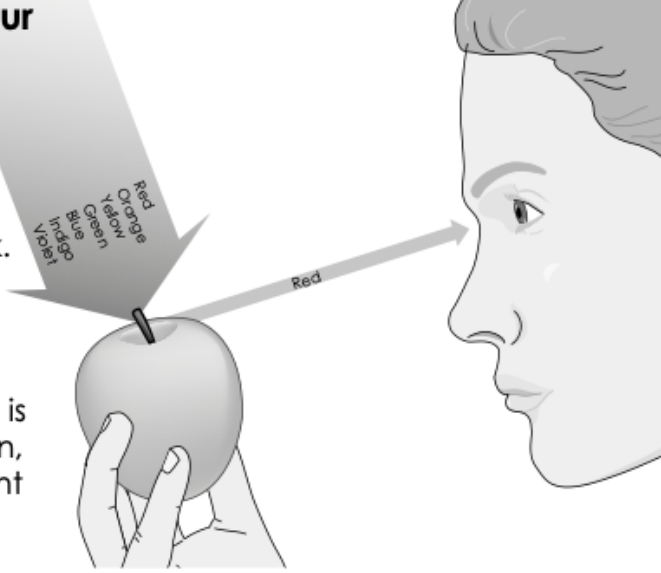
   _____
7. List the colours of the light spectrum in order from red to violet.

   Red _____ Violet

# Seeing in Colour

When light hits an object, some of that light is absorbed by the object, and some of it is reflected off of the object. If white light (from the Sun for example) hits an object and the red, orange, yellow, green, blue, indigo and violet light are absorbed, very little light will be reflected into your eye. The object will appear black. If the opposite occurs, in other words the red, orange, yellow, green, blue, indigo and violet light are reflected, the object will appear white.

The apple in the diagram appears bright red. This is because the apple is absorbing orange, yellow, green, blue, indigo and violet light, and only reflecting red light into your eye.




1. Cross out the words in bold that are not correct

   (a) A red apple appears **red/green/black** in white light because it is **reflecting/ refracting** the **red/green/black** light and absorbing all the other colours.

   (b) A red apple appears **red/green/blue** in red light because it is **reflecting/refracting** the **red/green/blue** light.

   (c) A red apple would appear **red/green/black** in blue light because the apple would **absorb/reflect** the blue light. There would be no light to **absorb/reflect**.

2. At an evening rugby match, one team wears red uniforms and the other wears green uniforms. When the floodlights are switched on they give out blue light. Outline why this causes problems for the players as well as the spectators.

3. For this year's school production, your school is presenting 'Alice in Wonderland'. Some of the cast dress up as playing cards. Their costumes are white with the playing card patterns painted on. The stage is lit by red light. Using the words *absorb* and *reflect* to explain why the red nine of hearts and the red nine of diamonds look red all over.

4. Write a paragraph to explain why a lime flavoured ice-block appears green. You should add information to the diagram.