

The background of the slide is a dark, gradient-colored surface with a grid of approximately 70 small, circular, glowing lights in various colors including red, blue, yellow, green, and white. The lights are arranged in a roughly rectangular pattern, with some lights appearing brighter than others. In the center of the slide, there is a light blue rectangular box with a thin black border containing the title and subtitle text.

Light & Colour
Revision

Form Group 8 0

1. Light travels away from its source in all directions.



2. Light travels much faster than sound at a speed of $300,000,000 \text{ m/s}$, which is the same as $300,000 \text{ km/s}$.

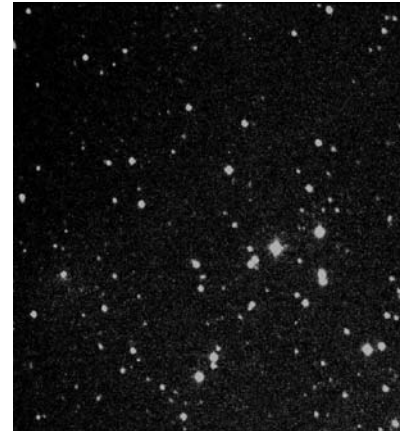


3. We see because light enters our eyes.



Light travels in a straight line
directly into your eye.

5. Light sources include light bulbs, flames, TV Screens, the Sun and the stars.

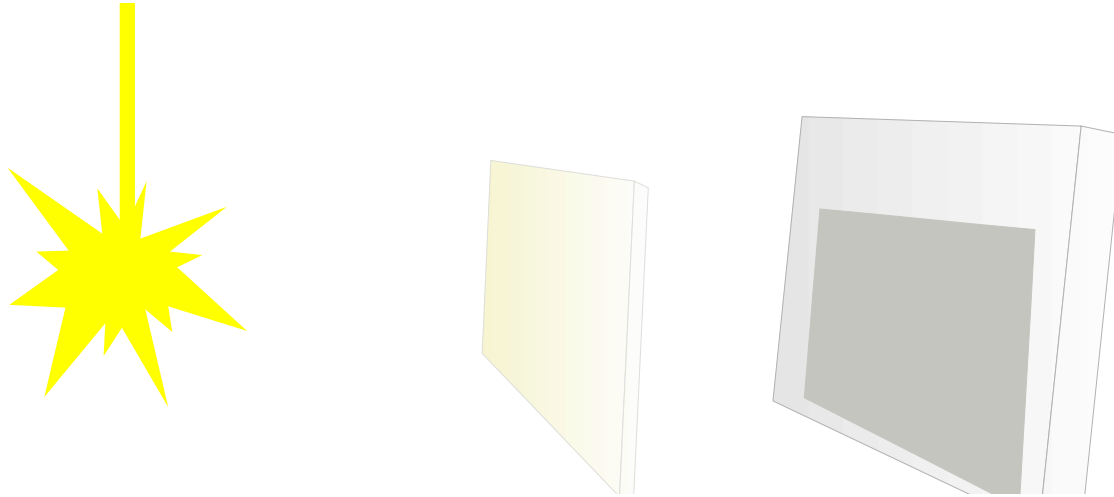


Notes...

1. Light travels very **quickly** in straight lines and away from its source in all directions.
2. Light travels **faster** than sound.
3. Light sources include light **bulbs**, flames, TV Screens, the Sun and the stars.



Opaque materials do not allow light to pass through them.

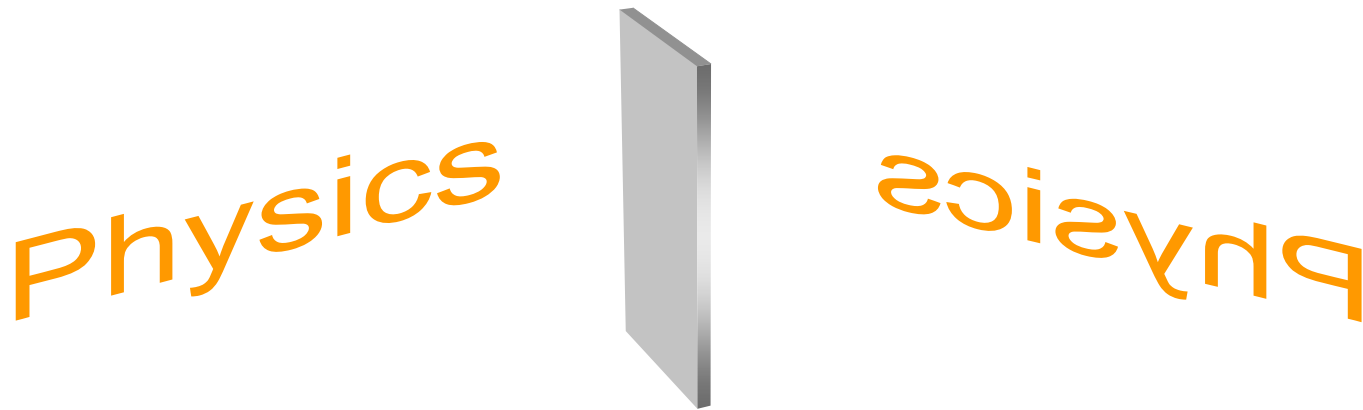


Transparent materials allow light to pass through them.

A material that is **translucent** only lets part of the light through.

- A plane mirror reflects light regularly so that it produces a clear image which is the same size as the object.

What is different about the image?



- When something is reflected in a plane mirror, left becomes right and right becomes left.

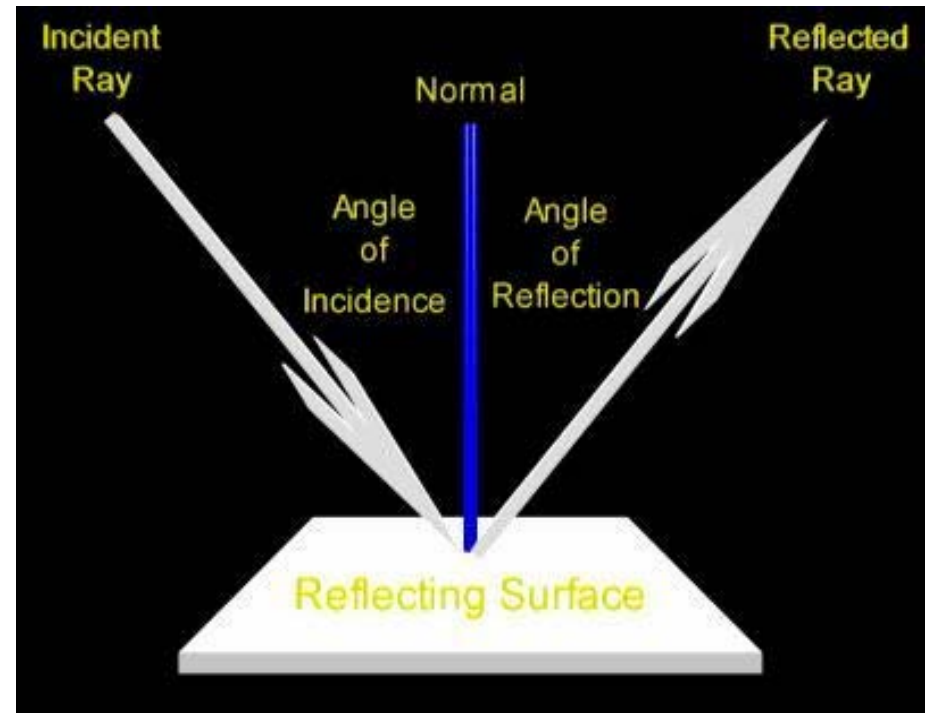
Notes...

- Light is reflected from many surfaces.
- Light can be reflected and also absorbed.
- Reflection is when the light bounces off most surfaces and enters in our eyes.
- Light being reflected in a plane mirror, left will become right and right will become left.



Reflected Light...

- When a light reflects off a surface, you can predict where it will go. We can use a thin beam of light that we call **RAY**.



- The arrows show the direction of the light.
- The angle between the ray and the mirror is the same for the i and r ray.

Notes...

1. Light is reflected from many surfaces.
2. The law of reflection is:
angle of incidence (i) = angle of reflection (r)
3. Pale and shiny surfaces are good reflectors, dark and rough surfaces are not.

Bending Light...

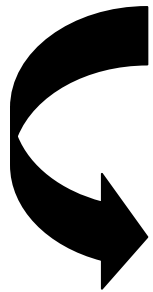
The speed of light waves depends on the material they are travelling through.

air = fastest

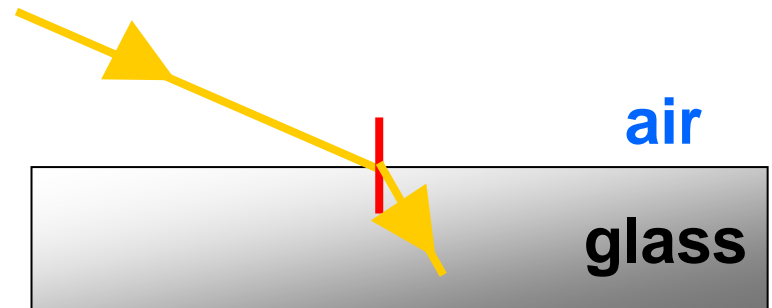
glass = slower

diamond = slowest

If light waves enter a different material (e.g. travel from glass into air) the speed changes.

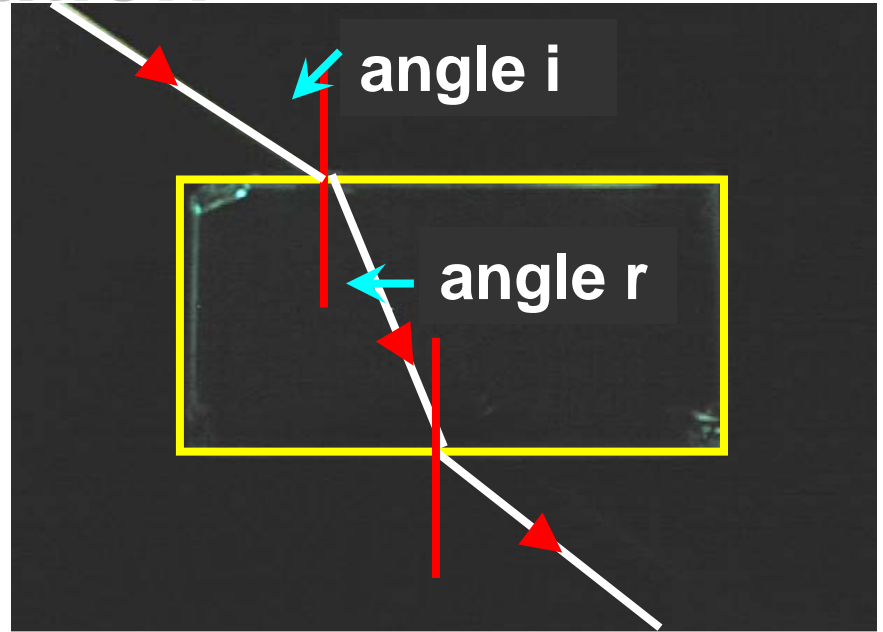


This causes the light to bend or **refract**.



Refraction investigation

1. Place a rectangular glass block on a sheet of paper and draw around it.
2. Draw a normal line (at 90°) along the top surface of the block.
3. Shine rays of light with incident [i] angles of 30° , 60° and 0° into the block, making sure they all hit where the normal line crosses the glass surface. Measure angle ' r ' each time and record the results.



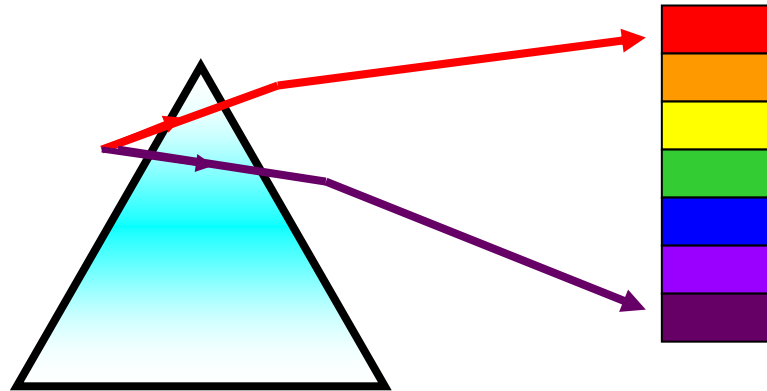
Notes...

1. When the light goes from one transparent material to another one it may refract (bend).
2. The light must enter the new material at an angle for refraction to happen.
3. Refraction happens because the light changes speed.
4. When light enters a **more dense medium** (e.g. glass), it bends **towards** the normal.

Splitting white light into colours

A prism splits a ray of white light into a spectrum of colours.

This is known as **dispersion**.



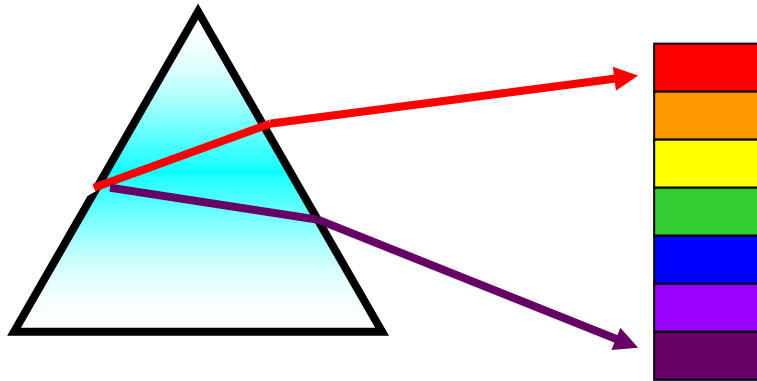
When white light is split, the colours always follow the same order.

Use this phrase to remember the order of colours:

Richard **O**f **Y**ork **G**ave **B**attle **I**n **V**ain

The different colours of light have different wavelengths, this means they are bent (refracted) by different amounts.

Which colour is refracted the most?



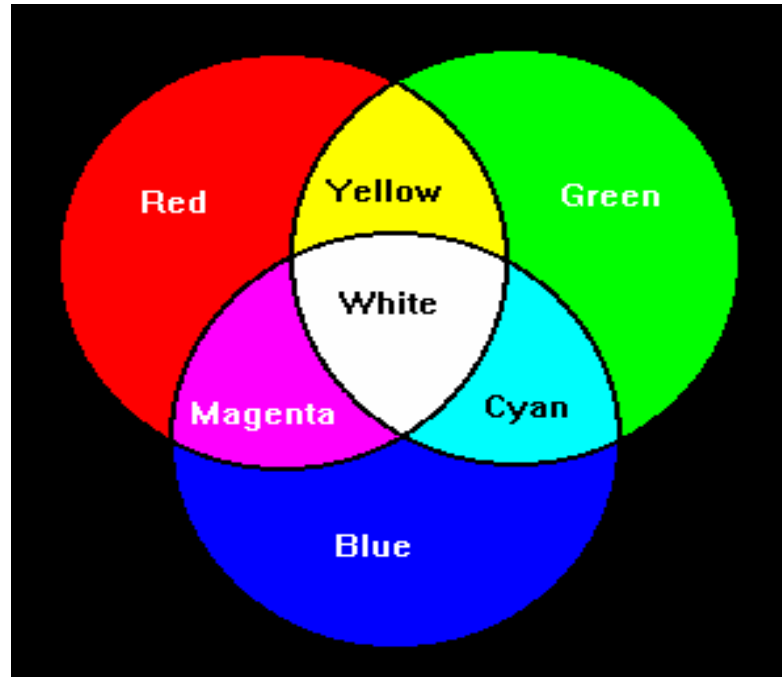
Red light is refracted least because it has the longest wavelength.

Violet light is refracted the most because it has the shortest wavelength.

Filters

What we have learned:

If a **red** filter is present, **red** light is seen
and if a **green** light is present then **green**
light is seen!!



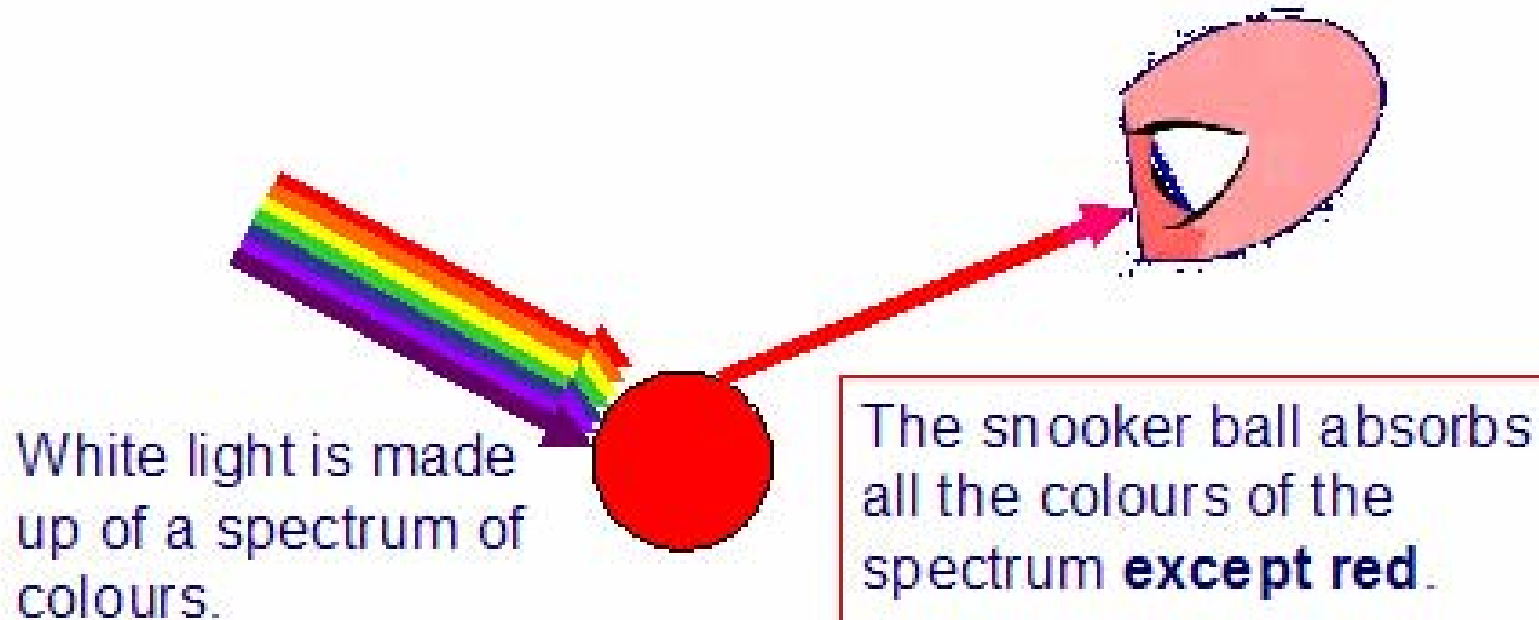
Primary Colours

- 1 - Red
- 2 - Green
- 3 - Blue

Secondary Colours

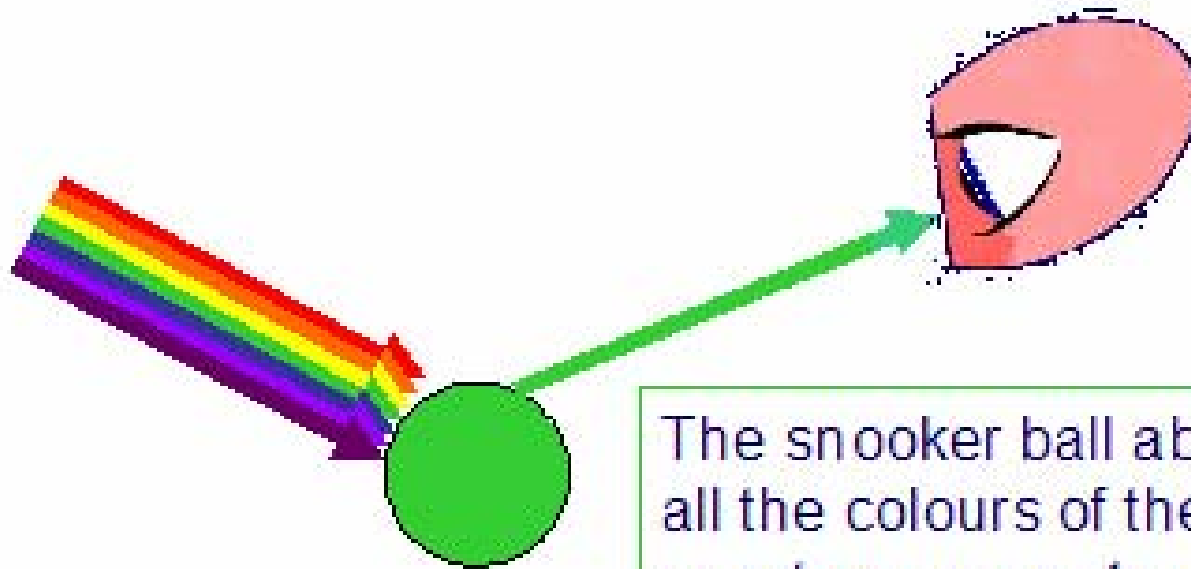
- 1 - Magenta
- 2 - Yellow
- 3 - Cyan

Why does a **red** snooker ball look **red** in white light?



Seeing red

Why does a **green** snooker ball look **green** in white light?

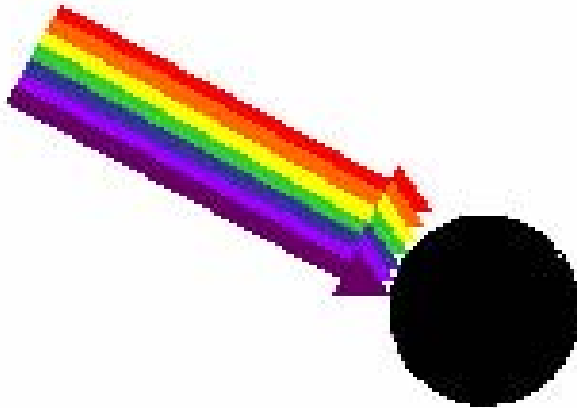


Seeing green

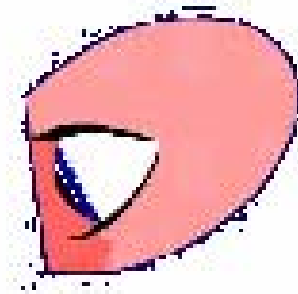
The snooker ball absorbs all the colours of the spectrum **except green**.

Only green light is reflected into your eye, so the snooker ball appears green.

Why does a **black** snooker ball look **black** in white light?



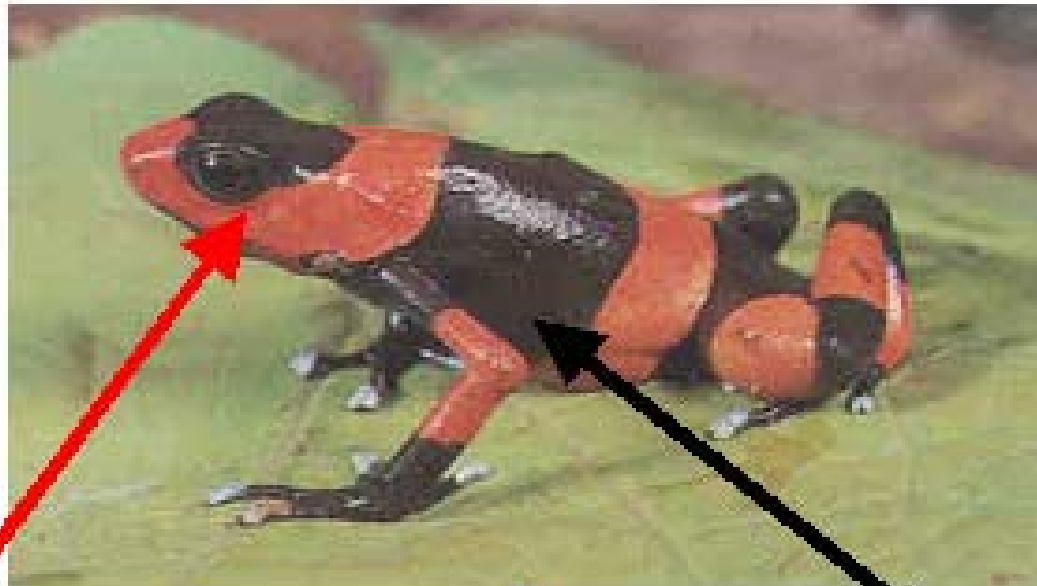
Seeing black



The snooker ball absorbs all the colours of the spectrum.

No light is reflected into your eye, so the snooker ball appears black.

What colours are absorbed by this frog's skin?
What colours are reflected into your eyes?



This part of the skin absorbs all the colours of the spectrum except red, and so reflects red light.

This part of the skin absorbs all the colours of the spectrum and none are reflected.

Magenta, cyan and yellow filters...

A magenta filter absorbs
all colours...



... apart from red and blue.

A cyan filter absorbs
all colours...



... apart from green and blue.

A yellow filter absorbs
all colours...

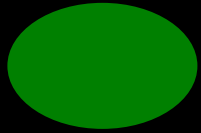


... apart from red and green.

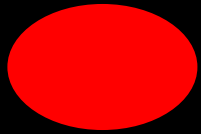
LIGHT QUIZ

WHAT DO YOU
REALLY KNOW?

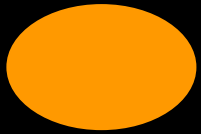
Hold up the correct ball colour for
the right answer.



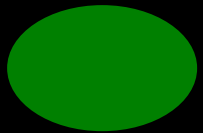
Light is reflected
from many surfaces.



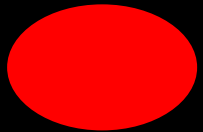
Light don't come
from many surfaces.



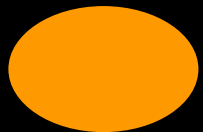
Light is reflected from
just one surface.



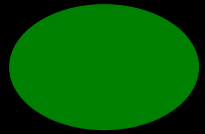
Light can't be reflected.



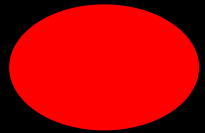
Light can be reflected and absorbed.



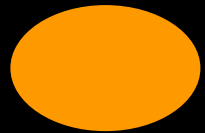
Light can't be absorbed.



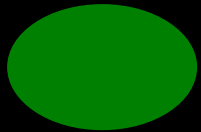
Richard Of York Gave Battle In Vain



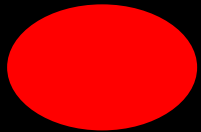
Richard Of York Gain Battle In Vain



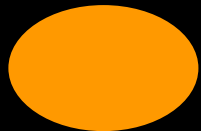
Richard Gave Battle In Vain



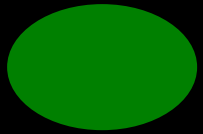
Cyan, magenta and red are the primary colours.



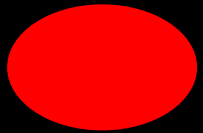
Cyan , magenta and yellow are the secondary colours.



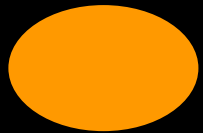
Cyan, red and green are the secondary colours.



Magenta, red and blue are the primary colours.



Red, green and magenta are the secondary colours.



Red, green and blue are the primary colours.