Subtractive Colour Theory
Subtractive Colour Theory of Light

When a light wave strikes an object

- Some wavelengths of light reflect, which means that they bounce off the object.
- Other wavelengths are absorbed by the object.
- The colour you see when you look at an object depends on the wavelengths that are reflected.
Subtractive Colour Theory of Light

- A red object has particles of pigment that absorb the other two primary light colours blue and green, and reflects red light.
When yellow, **blue** light is **absorbed** and both **red** and **green light** are reflects. An objects colour is determined by the colours it reflects. *Remember white light contains Red, Green and Blue light.*
According to the **subtractive colour theory** of light, coloured material absorbs different colours or wavelengths of light.

The colours that are absorbed are “subtracted” from the reflected light that is seen by the eye.

- A **black** object **absorbs** all colours
- A **white** object **reflects** all colours.
- A blue object reflects blue and absorbs all other colours.
Subtractive Colour Theory of Light

- The primary and secondary colours of light for the subtractive theory are opposite to the colours of the additive theory.
- Cyan, magenta, and yellow are the primary subtractive colours.
- Red, green, and blue are the secondary subtractive colours.
Subtractive Colour Theory of Light

- Colours absorbed, will not make it to your eye. You only see the reflected colours.
- Paint and pigment manufacturers mix all three of the primary subtractive colours in varying degrees to make any range of colours reflect from a surface.
Primary pigments

Yellow  magenta  Cyan  Black
Filters also work by using the subtractive theory

- Filters contain **pigments**. As light is transmitted through the filter, these pigments absorb some light colours but not all.
- Example: A blue filter absorbs red and green light, and transmits blue light.
Filters and Subtractive Theory

What light colours would a cyan filter absorb and transmit?
Colour Printing

- The theory of subtractive colours is applied to colour printing.
- Colour printers use three primary colours, yellow, cyan and magenta which can produce over 1 million colours.