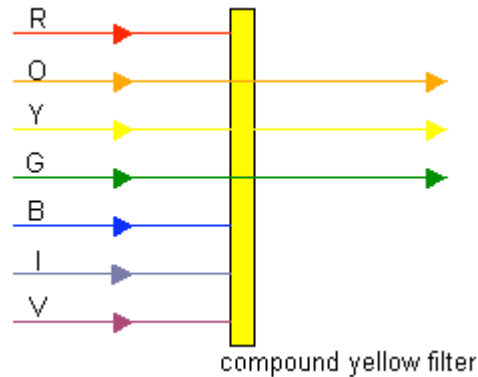


Compound Filters

The dyes and pigments used in paints and transparent filters are not pure. A yellow filter doesn't just let yellow light pass through, it lets a little of the colours of the spectrum adjacent to it pass through.

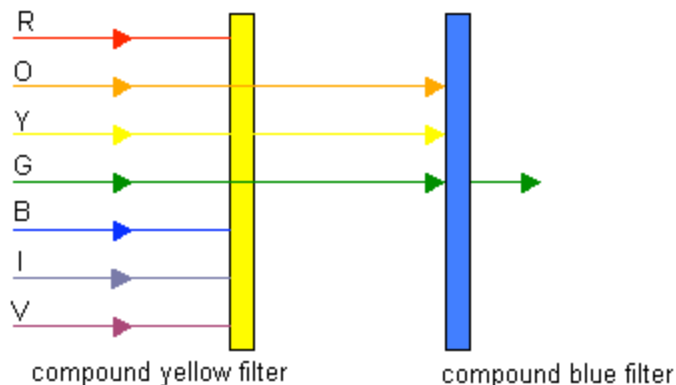


Notice that orange and green (adjacent to yellow) are transmitted through a compound yellow filter. A compound yellow **object** would similarly reflect some orange and green along with the yellow colour.

Two Compound Filters

What happens when a blue compound filter is added to a yellow compound filter?

We see from above that a compound yellow filter lets yellow, orange and green pass through. A blue compound filter would let blue, green, and indigo through (since green and indigo are adjacent).



Since green light is the only colour common to both filters, green alone would emerge.










A similar process occurs when mixing paints, or using coloured lenses in photography. You probably remember from your younger years that mixing blue and yellow paints or crayons produces green.

This process of starting with white light and absorbing or subtracting colours is called **colour by subtraction** or the **Subtractive Theory of Colour**.

Artificial Lights

Artificial lights do not emit all the colours of the spectrum. Mercury vapour street lights emit very little red light, so skin (normally pinkish) appears pale and greenish. Clothes that look one color in a store with fluorescent lights may look a slightly different colour at home. The lights in the store would not be emitting all the colours of the spectrum.

Colour Addition

- Red, blue, and green are called the additive primary colours. (Unlike the art world, who think it is red, blue and yellow)
 - If you take three lights with red, blue, and green filters, you can make other colours.
 - red + blue → magenta  +  = 
 - red + green → yellow  +  = 
 - blue + green → cyan  +  = 
- Televisions and computers work on this principle and are able to make every colour possible by mixing these three. Have you heard of RGB? that's red, green, blue
- Any two colours of light that produce white light are called complimentary colours
 - magenta (red + blue) + green → white
- This is called "colour addition"

Examples:

1. What colour is produced when you mix red and green? yellow
2. What colour is produced when you mix cyan and yellow? greenish white
3. Magenta and green? white
4. What is the complimentary colour of blue? (yellow) Of cyan? (red)

Remember: Something that appears blue is absorbing all colours except for blue.

Something that appears white is reflecting all colours and something that appears black is absorbing all colours.