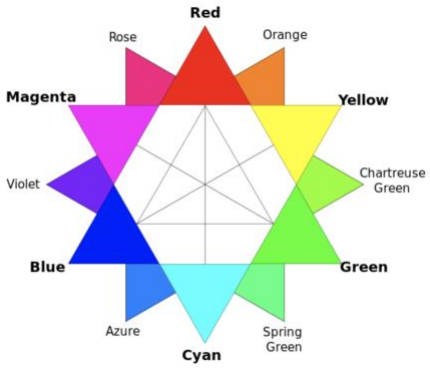
UV/ visible Spectrophotometry

https://www.youtube.com/watch?v=O39avevqndU

Document 1: Identifying a compound by spectrophotometry

- If a compound absorbs light its absorption spectrum is a unique property of that compound.
- The molecular structure is responsible for the absorption properties
- The most common feature of absorbing compounds are conjugated double bonds, often as an aromatic ring
- Conjugated double bonds result in pi electrons above and below the ring or chain and these electrons can be "moved" to higher levels by photons of light.
- As the electrons are promoted to higher levels "allowed" by the molecular structure they absorb light of a specific wavelength, based on the energy required for the transition (ΔE).
- This amount of absorbed energy (ΔE) will determine the λ of light absorbed.

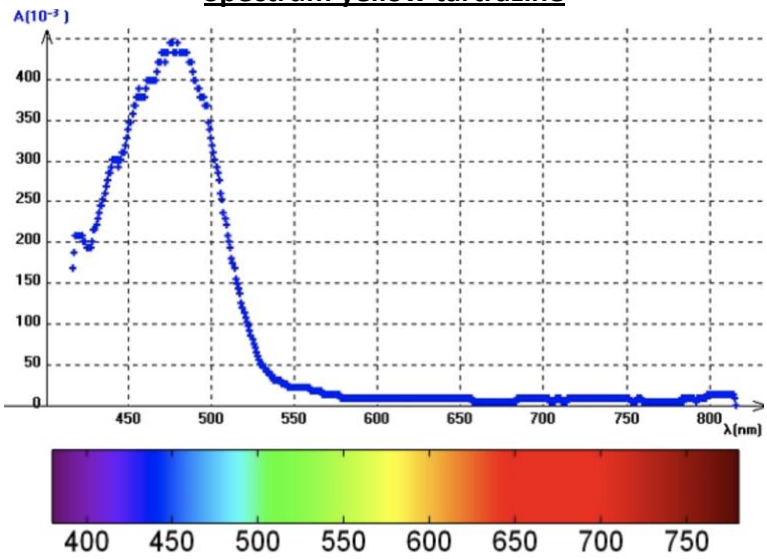
Document 2: The relationship between colour and absorption



A compound will be yellow if it reflects light in the yellow wavelengths and absorbs light of complementary colours wavelengths.

Yellow compounds usually absorb in the blue range ~450 – 350 nm

Spectrum yellow tartrazine



Questions:

1. What are conjugated double bonds? Give an example.
2. Use a diagram to show the electronic transfer.
3. Give a formula who links energy with wavelength.
4. Give the appearance of the spectrum of a green compound and justify.
5. What are the factors influencing absorbance?
6. Besides identifying a compound, spectrophometry is used to measure the concentration of a compound. Give a formula which links absorbance and concentration.