

This event is being supported by Education Scotland's Enhancing Professional Learning in STEM Grants Programme through the Scottish Government STEM Education and Training Strategy.



## Colour & Light

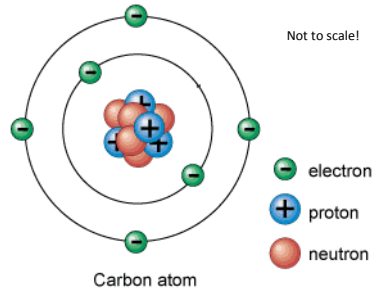
What is it?

[Tigtag](#)

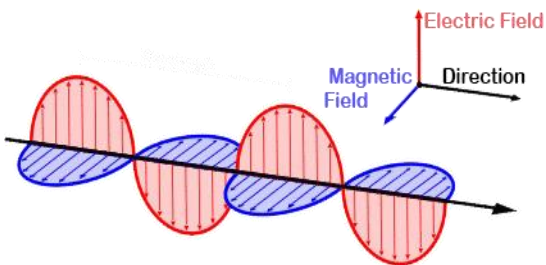
### What is giving off light?

- Look around the room?
- What can you see?
- Can you see everything because it gives off light?
- Let's turn off the lights and let's see what we can see.

### Atoms



### Light- really really really hard stuff!



FLAME TEST COLOURS					
LITHIUM Li <sup>+</sup>	SODIUM Na <sup>+</sup>	POTASSIUM K <sup>+</sup>	RUBIDIUM Rb <sup>+</sup>	CAESIUM Cs <sup>+</sup>	CALCIUM Ca <sup>2+</sup>
STRONTIUM Sr <sup>2+</sup>	BARIUM Ba <sup>2+</sup>	RADIUM Ra <sup>2+</sup>	COPPER Cu <sup>2+</sup>	IRON Fe <sup>2+/3+</sup>	BORON B <sup>3+</sup>
INDIUM In <sup>3+</sup>	LEAD Pb <sup>2+</sup>	ARSENIC As <sup>3+</sup>	ANTIMONY Sb <sup>3+/5+</sup>	SELENIUM Se <sup>4+/6+</sup>	ZINC Zn <sup>2+</sup>

## THE CHEMISTRY OF FIREWORKS

<b>RED</b> STRONTIUM SALTS Strontium Nitrate Strontium Carbonate Strontium Sulphate	<b>ORANGE</b> CALCIUM SALTS Calcium Carbonate Calcium Chloride Calcium Sulphate	<b>YELLOW</b> SODIUM SALTS Sodium Nitrate Sodium Oxalate Cristite	<b>GREEN</b> BARIUM SALTS Barium Nitrate Barium Chloride Barium Chlorate
<b>BLUE</b> COPPER SALTS Copper (I) Chloride Copper Carbonyl Copper Oxide	<b>PURPLE</b> COMBINE COPPER & STRONTIUM COMPOUNDS	<b>SILVER</b> WHITE HOT MAGNESIUM & ALUMINIUM Fluoride	<b>WHITE</b> BURNING METAL Magnesium Titanium

Color in fireworks is produced by pyrotechnic stars, which produce colored light when ignited. The stars contain five basic ingredients. Metal salts are used to produce color; a fuel is needed to allow the star to burn; an oxidising chemical provides oxygen for the combustion of the fuel; a chlorine-donating compound helps strengthen some colors; and a binding chemical holds the mixture together.

**FIREWORKS.COM**

## THE CHEMISTRY OF FIREWORK COLOURS

COLOUR PRODUCERS	FUEL	OXIDISER	BINDER	CHLORINE DONOR
<ul style="list-style-type: none"> <li>Sr</li> <li>Br</li> <li>Cu</li> <li>Ca</li> <li>Na</li> <li>Mg</li> </ul>	<ul style="list-style-type: none"> <li>CS</li> <li>TPS</li> <li>TPS</li> <li>TPS</li> <li>TPS</li> <li>TPS</li> </ul>	<ul style="list-style-type: none"> <li>NO<sub>2</sub></li> <li>NO<sub>2</sub></li> <li>NO<sub>2</sub></li> <li>NO<sub>2</sub></li> <li>NO<sub>2</sub></li> <li>NO<sub>2</sub></li> </ul>	<ul style="list-style-type: none"> <li>TPS</li> <li>TPS</li> <li>TPS</li> <li>TPS</li> <li>TPS</li> <li>TPS</li> </ul>	<ul style="list-style-type: none"> <li>Cl<sub>2</sub></li> <li>Cl<sub>2</sub></li> <li>Cl<sub>2</sub></li> <li>Cl<sub>2</sub></li> <li>Cl<sub>2</sub></li> <li>Cl<sub>2</sub></li> </ul>

**NEED TO KNOW**  
3 REQUIRED FOR IT

Allow fireworks to burn; granules (oxidation) react; sulfur & charcoal, to allow.

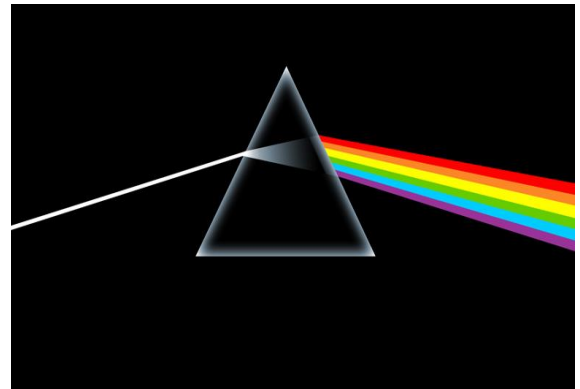
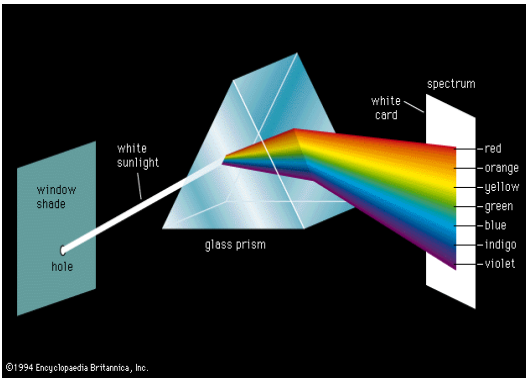
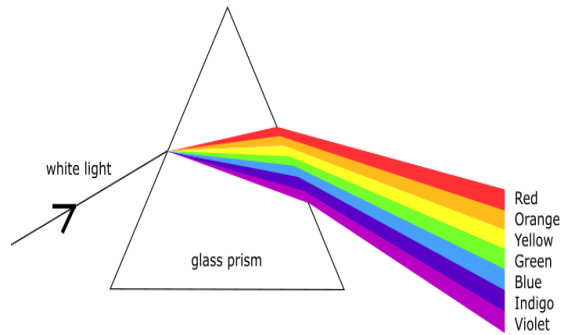
Usually nitrate, chlorate or perchlorate compound to provide oxygen for the combustion of fuel.

Hold the mixture together; the most commonly used is starch; others, based on wax.

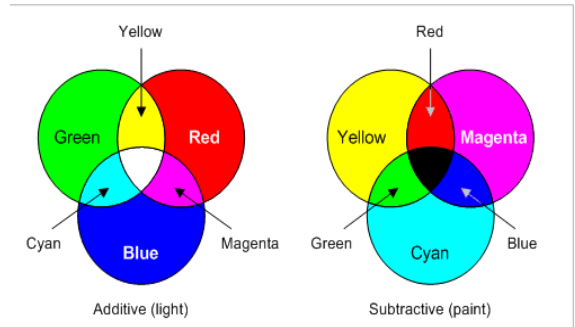
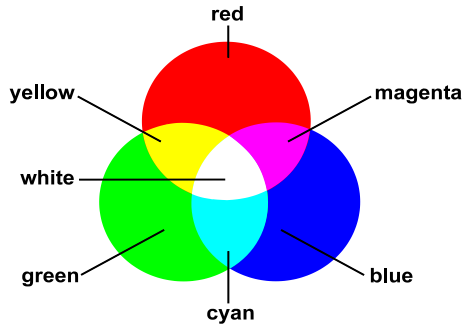
Chlorine donors help strengthen some colours. Some oxidizers can also act as chlorine donors.

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<https://www.youtube.com/watch?v=9EUFVl0nGt8>

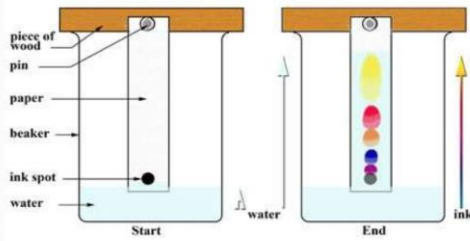


Light - Primary and Secondary Colours

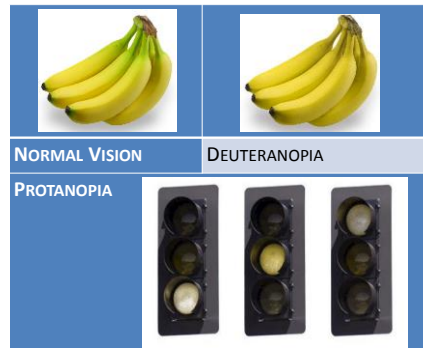


**WARNING:** Make sure the water in the beaker is below the ink spot or the ink will just go into the water.

Simple chromatography



Do you see what I see?



Brand New! So send me a picture

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I'll make a primary science section somewhere just for you!