THE ART AND SCIENCE OF FIREWORKS

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Did you know fireworks were born from a quest for immortality?

Alchemists in 10th century China stumbled on gunpowder (sulfur, coal, & potassium nitrate) while searching for the *elixir of life*.

The result? A fiery invention that would forever change celebrations!

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Fireworks don't actually explode!

Fireworks are designed to slow burn, *not* blow up!

Chemists use big, coarse fuel and keep the oxidizer separate to create a long-lasting, colorful display across the sky.

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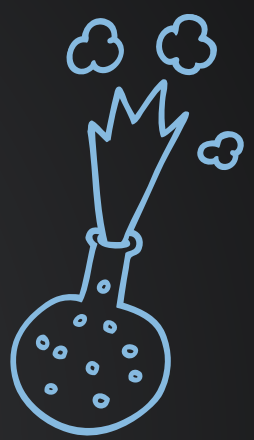
How do fireworks get their color?

Each color is a chemical reaction!



Stars, packed with colorant chemicals, absorb energy from the burning fuel, causing electrons to jump to higher states. As they fall back, they release that energy as vibrant light!

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How do they do different shapes?

Technicians arrange fuel and colorants inside the firework in certains ways for certain shapes.

Circles: Fuel core with a ring of pellets.

Double Rings: Two layers of pellets.

Streaks: Colorants mixed with fuel for a willow tree effect.

Hearts / Stars: Colorants glued on paper in the desired shape!

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While fireworks are beautiful, they're not fun for everyone.

Heavy metals and chemicals from fireworks can enter waterways and air, affecting wildlife and those with respiratory issues.

Their loud noises can also frighten animals and trigger those with PTSD.

So please, **celebrate responsibly.**

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https://www.smithsonianmag.com/science-nature/5-things-you-didnt-know-about-the-science-of-fireworks-481649/