What are nebulae?

KS2 KS3 Ages 7-14 ⏰ 2 min read

Look up at the night sky and you're seeing stars — tiny pinpricks of light scattered across the darkness. But between those stars, space isn't actually empty. It's filled with enormous clouds of gas and dust called **nebulae** (that's the plural — one cloud is a nebula).

Most nebulae are so faint that you can't see them with your naked eye, but with telescopes, they reveal themselves as some of the most spectacular sights in the universe. They come in brilliant colours — pink, blue, green, and gold — and can stretch across distances so vast that light takes years to cross from one side to the other.

Star Nurseries and Stellar Graveyards

Nebulae aren't just pretty decorations floating in space. They're actually where the most dramatic events in the universe happen. Some nebulae are **stellar nurseries** — places where new stars are born. The gas and dust slowly clump together under gravity until it gets so dense and hot that nuclear fusion ignites, creating a brand new star.

Other nebulae are **planetary nebulae** (though they have nothing to do with planets — astronomers just thought they looked planet-like through early telescopes). These form when dying stars puff off their outer layers, creating beautiful, colourful shells of glowing gas around the remaining stellar core.

Think of nebulae like cosmic recycling centres. Old stars die and scatter their material into space, which eventually gets collected into new nebulae where fresh stars can form — it's the universe's way of reusing its building blocks.

Why Do They Glow?

You might wonder why nebulae shine with such brilliant colours when they're mostly made of the same stuff as stars — hydrogen gas. The secret is that nearby hot stars act like cosmic light bulbs, energising the gas and making it glow. Different elements

glow in different colours: hydrogen glows red, oxygen can glow green or blue, and other elements add their own hues to the mix.

Some of the most famous nebulae have wonderfully descriptive names that hint at their appearance: the Crab Nebula, the Eagle Nebula, the Horsehead Nebula. Each one tells a story about the life and death of stars, painted across the canvas of space in colours more vivid than any earthly sunset.

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