What Stars Are Made of and How Far Away

KS3 Ages 11-14 ⏰ 3 min read

What Are Stars Made Of?

Stars are massive balls of **hot gas** that shine because of incredible heat and pressure inside them. The main ingredients are two gases: **hydrogen** and **helium**. In fact, about **75% of a star is hydrogen**, and most of the rest is helium, with tiny amounts of heavier elements mixed in.

At the very centre of a star, the temperature reaches millions of degrees. This extreme heat causes hydrogen atoms to fuse together and form helium, releasing enormous amounts of energy in the process. This energy is what makes stars glow and shine across space.

Think of it like a massive nuclear power plant in the sky, but instead of cooling down, a star is burning hotter and hotter at its core.

How Far Away Are Stars?

Stars are incredibly, mind-bogglingly far away. The closest star to us (apart from our own **Sun**) is **Proxima Centauri**, which is **4.24 light-years away**. A **light-year** is the distance light travels in one year—about **9.5 trillion kilometres**.

This means the light we see from Proxima Centauri today actually left that star **4.24 years ago**. We're seeing it as it was in the past! Most other stars are even more distant. The stars you see twinkling above on a clear night are hundreds or thousands of light-years away.

Think of it like looking at your friend across a huge field, but the light takes so long to travel that you're always seeing an old photo of them, not what they look like right now.

Why Are They So Far?

Space is genuinely enormous. Even our fastest spacecraft would take about **70,000 years** to reach Proxima Centauri. This vast distance is why stars appear as tiny points of light rather than the giant glowing balls they actually are. If you could

shrink the Sun down to the size of a pea, the nearest star would be another pea located **250 kilometres away**—that shows just how spread out everything in space really is.

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