How to Calculate the Volume of a 3D Shape

KS2 MATHS GEOMETRY MEASUREMENT Ages 9-12 ⏰ 3 min read

What is Volume?

Volume is the amount of space something takes up inside. When you pour juice into a glass, the juice fills up space — that space is the volume. Unlike **area**, which measures flat surfaces, volume measures how much room a **3D shape** (a shape with length, width, and height) can hold.

We measure volume in **cubic units**, like cubic centimetres (cm^3) or cubic metres (m^3). The word "cubic" reminds us that we're thinking about three dimensions.

Think of it like filling a swimming pool. The pool has length, width, and depth. Volume tells you how much water fills the entire pool.

How to Calculate Volume

Different shapes need different **formulas**. A formula is a special rule that helps you work out the answer.

For a Cuboid (a rectangular box): Multiply length × width × height. So if a box is **5cm long, 3cm wide, and 2cm tall**, the volume is **5 × 3 × 2 = 30cm³**.

For a Cube (all sides equal): Multiply side × side × side (or side³). A cube with sides of **4cm** has a volume of **4 × 4 × 4 = 64cm³**.

For a Cylinder (like a tin of beans): Multiply π × radius² × height. This one uses **π (pi)**, which is about **3.14**. If the radius is **2cm** and height is **10cm**, the volume is roughly **3.14 × 4 × 10 = 125.6cm³**.

Think of it like recipes. Different recipes need different ingredients in different amounts — just like different shapes need different formulas.

Why Does Volume Matter?

Understanding volume helps in real life. Builders need to know how much concrete fills a foundation. Scientists need to measure how much liquid fits in a container. Even

video game designers use volume to create 3D worlds.

The key is remembering that **volume = space inside**, and each shape has its own special formula to find that space.