How to Choose the Right Material for a Product

KS4 DESIGN & TECHNOLOGY Ages 11-14 ⏰ 3 min read

What Makes a Good Material?

When designers create a new product—whether it's a phone case, a bicycle helmet, or a water bottle—they have to choose the right **material**. But how do they decide? It's not just about picking whatever feels nice. Engineers test materials against several important factors to make sure the final product will work well, last long, and be affordable.

The **function** of a product is the first thing to consider. What does it need to do? A material for a raincoat must be waterproof, while a material for running trainers needs to be flexible and cushioned. The same material won't work for every job.

Testing for Strength and Durability

Strength is how well a material can handle stress without breaking. **Durability** means how long it lasts before wearing out. Designers test materials by bending them, stretching them, dropping them, and exposing them to heat and cold. An aeroplane wing needs a material that's incredibly strong but also light, while a garden chair just needs to support weight without rusting.

Think of it like choosing the material for a playground slide. You wouldn't use paper (it tears) or glass (it breaks), but plastic or metal works because they're tough enough for thousands of children to slide down.

Cost and Environmental Impact

Materials also come with a price tag. **Plastic** is cheap but doesn't biodegrade, while **bamboo** is pricier but grows back quickly. Good designers balance cost against **environmental impact**—how much damage the material does to the planet when it's made, used, and thrown away.

Many companies now ask: Can we recycle this material? Will it pollute the ocean? Does its production create greenhouse gases? These questions matter more every

year as we try to protect Earth.

The Testing Process

Before a product reaches shops, designers create **prototypes** (test versions) and push them to their limits. They might test a phone screen's scratch resistance, a fabric's water resistance, or a metal's ability to handle rust. This is called **material testing**, and it's expensive but essential.

Think of it like trying on five different pairs of trainers before a long run to see which one feels best and won't give you blisters.

The right material choice can be the difference between a product that lasts years and one that falls apart in weeks. It's one of the most important decisions a designer makes.