# Nova’s Guide to the Properties of Materials

Explore, Test, and Discover: What makes a material perfect for the job?

- **Thermal conductors allow heat to pass through them easily, while thermal insulators trap heat, which is why we use plastic for pan handles.**
- **Solubility describes whether a substance will dissolve in a liquid to form a solution; if a substance does not dissolve, it is called insoluble.**
- **Materials can be sorted by their state of matter—solid, liquid, or gas—at room temperature, though some can change state when heated or cooled.**
- **A material’s hardness is tested by how easily it can be scratched or indented, which helps engineers decide if it is suitable for building structures.**
- **Reversible changes, such as melting ice or dissolving salt in water, can be undone to recover the original material, unlike irreversible chemical changes.**

*Did you know? Did you know that some materials can be both flexible and strong? For instance, the carbon fibres used in modern aeroplane wings are thinner than a human hair but are incredibly tough, allowing them to bend slightly during turbulence without snapping!*

**Key vocabulary: Conductivity · Thermal insulator · Hardness · Solubility · Transparency · Magnetism · Reversibility**