

# Introduction to Materials Science and Technology

## What is Materials Science?

Materials make modern life possible—from the polymers in the chair you're sitting on, the metal ball-point pen you're using, and the concrete that made the building you live or work in to the materials that make up streets and highways and the car you drive. All these items are products of materials science and technology (MST). Briefly defined, materials science is the study of “stuff.” Materials science is the study of solid matter, inorganic and organic. Figures 1.1, 1.2, 1.3, and 1.4 depict how these materials are classified.

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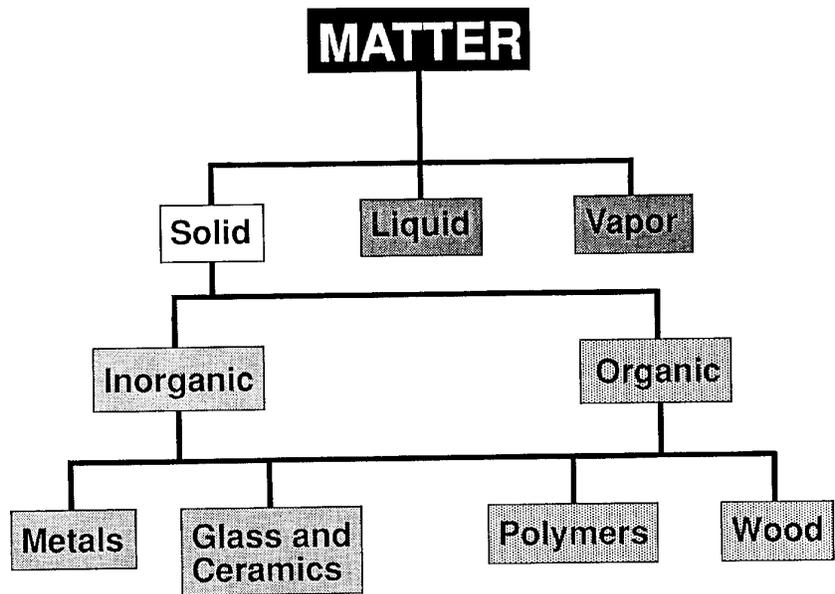


Figure 1.1. Physical Classification of Materials by State

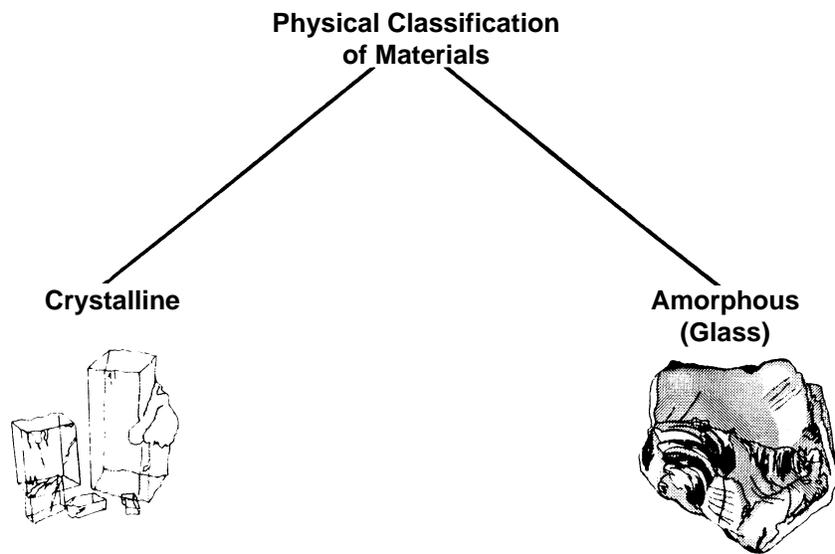


Figure 1.2. Physical Classification of Materials by Morphological Structure

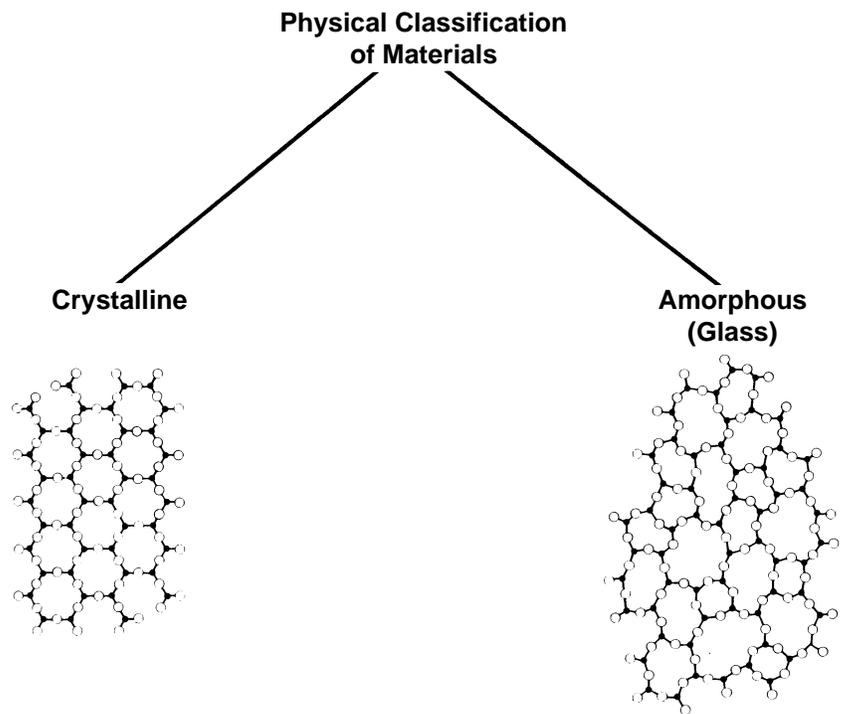


Figure 1.3. Physical Classification of Materials by Atomic Structure

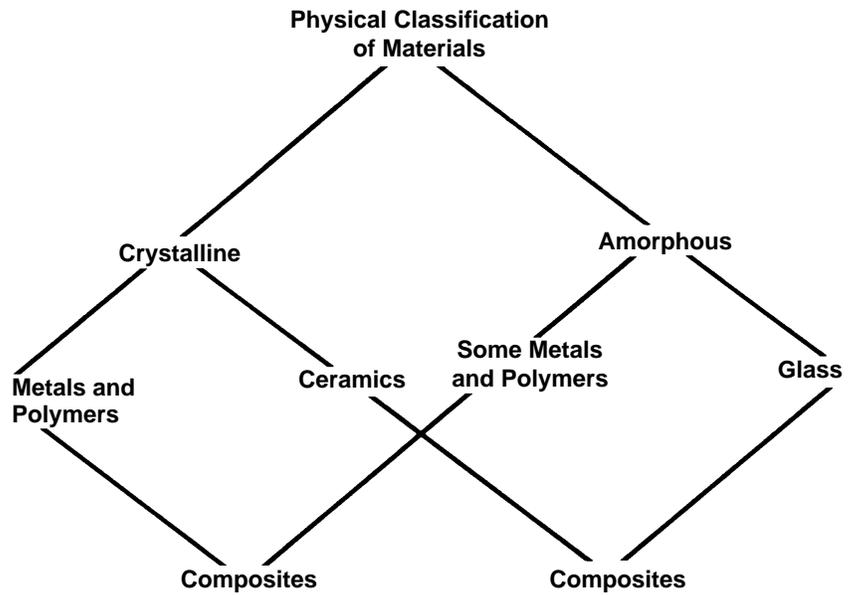


Figure 1.4. Interrelationships Between Classes of Materials

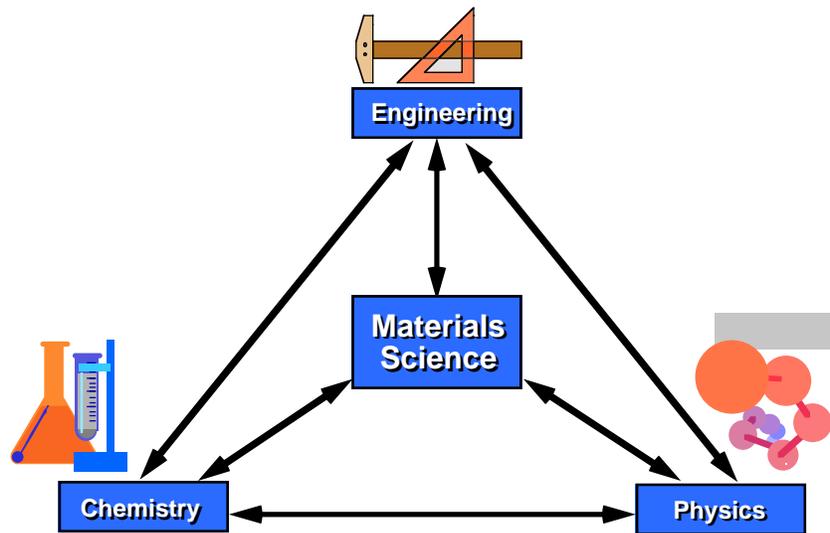
**“Technology draws on science and contributes to it.”**

**—AAAS Project 2061  
Science for All Americans**

Materials science and technology is a multidisciplinary approach to science that involves designing, choosing, and using three major classes of materials—metals, ceramics, and polymers (plastics). Wood also could be used. Another class of materials used in MST is composites, which are made of a combination of materials (such as in particle board or fiberglass).

Materials science combines many areas of science. Figure 1.5 illustrates how materials science draws from chemistry, physics, and engineering to make better, more useful, and more economical and efficient “stuff.”

Because of the interdisciplinary nature of materials science, it can be used both as an introductory course to interest students in science and engineering and also as an additional course to expand the horizons of students already taking science and mathematics courses.



**Figure 1.5.** Materials Science and Technology—A Multidisciplinary Approach