Exploring Materials

A. Polymers and Composites
    a. Key Concepts
        i. Polymers form when chemical bonds link large numbers of monomers in a repeating pattern.
        ii. Many composite materials include one or more polymers.
        iii. Synthetic polymers are strong, inexpensive to make, and last a long time.
        iv. It is often cheaper to throw plastics away and make new ones than it is to reuse them. As a result, plastics increase the volume of trash.
    b. Key Terms
        i. Polymer
        ii. Monomer
        iii. Plastic
        iv. Composite
B. Metals and Alloys
    a. Key Concepts
        i. Alloys are used much more than pure metals because they are generally stronger and less likely to react with air or water.
        ii. Many alloys are made by melting metals and mixing them together in carefully measured amounts.
    b. Key Term
        i. Alloy
C. Ceramics and Glass
    a. Key Concepts
        i. Ceramics resist moisture, do not conduct electricity, and can withstand temperatures that would cause metals to melt.
        ii. Glass is clear, can be made in many shapes and colors, and can't be penetrated by liquids.
    b. Key Terms
        i. Ceramic
        ii. Glass
        iii. Optical fiber
D. Radioactive Elements
    a. Key Concepts
        i. In 1896, the French scientist Henri Becquerel discovered radioactive decay quite by accident while studying a mineral containing uranium.

ii. Natural radioactive decay can produce alpha particles, beta particles, and gamma rays.
iii. Among the many uses of the decay of radioactive isotopes are determining the ages of natural materials on Earth, tracing the steps of chemical reactions and industrial processes, diagnosing and treating disease, and providing sources of energy.

b. Key Terms
   i. Nuclear reaction
   ii. Radioactive decay
   iii. Radioactivity
   iv. Alpha particle
   v. Beta particle
   vi. Gamma radiation
   vii. Half-life
   viii. Radioactive dating
   ix. Tracer