



Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
1989 Volume VI: Crystals in Science, Math and Technology

Crystals: More Than Meets the Eye

Guide for Curriculum Unit 89.06.07
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My unit on crystals has been developed along three rather broad lines of study. The first area deals with the actual structure of crystals beginning with a look at the atom, some atomic drawings of elements, and a look at compounds and their bonds. This helps to lead to an understanding of how crystals “look” and the shapes they can take. From there we can draw the crystals and construct them in three dimensions from paper as models. Directions for the actual growing of crystals are included and an explanation of crystal impurities is also found in this section.

The second major heading in my unit focuses on minerals. This includes a discussion of “what is a mineral?”, as well as characteristics of minerals such as color, hardness, luster, streak and specific gravity. Several labs are included which are based on those topic areas. I have selected quartz as a representative mineral group to look at more closely as it has many historic and modern technological uses. In addition quartz takes on many forms depending on environmental conditions during its formation, many of which are easily and inexpensively obtained for classroom samples.

The next area of examination within the broader category of “minerals” is gems and precious stones. I have discussed primarily rubies, sapphires, and emeralds. Diamonds, both natural and man-made, are also discussed here.

A general discussion of mineral formation by igneous, sedimentary, or metamorphic means is briefly covered as is the rather unique formation, the geode.

The final category for my unit is crystal technology. There is a rather detailed description of the make-up of a solar cell, with a list of additional sources for more information. I have dealt briefly with transistors and more extensively with liquid crystals. No study of crystals is complete without some mention of those technologically useful minerals which have become more valuable to society than any of the historical diamonds or other gems.

The appendices contain a variety of laboratory experiences for the student, some related mathematical problems and graphing, and also the directions for crystal growing. At the end of the unit is an annotated bibliography for further study by the reader with a key to the availability of those resources.

(Recommended for Physical Science classes, grades 7-9, and Earth Science classes, grades 7-8)

Key Words

Energy Solar Crystals Geology Science Minerals

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