"Teaching about Special Mineral Properties"

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There are more than 3,000 different minerals, although only a few form most of the rocks of Earth's crust. Each mineral has a definite composition and recognized properties. This hands-on workshop will provide opportunities to learn more about common and unusual mineral properties. Some mineral properties can be easily seen, such as crystal shape or luster. Others have to be tested with simple methods, such as hardness or density, while others require more elaborate analyses, such as chemical composition. We will discuss how mineral properties are used to identify ores.

Activity 1

We will make models of crystal structures using toothpicks and raisins. This explains how substitution of atoms of elements can produce different crystal shapes (cubic, hexagonal, etc.) and related minerals, such as calcite ($CaCO_3$) and dolomite [$CaMg(CO_3)_2$]. We will also model silicon-oxygen tetrahedra and study how these can be connected to form different silicate minerals.

Activity 2

We will explore fluorescence, the change in color under ultraviolet and normal light. Samples have been provided courtesy of the Sterling Hill Mining Museum in Franklin, NJ, USA [http://sterlinghillminingmuseum.org/] .

Activity 3

In the last part of this workshop, groups of teachers will study lesson plans about other special properties including cleavage and fracture, color, density and specific gravity, hygroscopy and dehydration, luster, magnetism, streak, and tenacity (breaking, bending, stretching.) They will then share the plans with other participants.

Selected web sites useful for learning about minerals

Mineralogical Society of America "Important Ore Minerals"
http://www.minsocam.org/msa/collectors_corner/article/oremin.htm

Minerals and Gemstone Kingdom (http://www.minerals.net/)

Mineral Uses, Properties, Descriptions (http://geology.com/minerals/)

Oxford University Museum "Learning Zone: Minerals" (http://www.oum.ox.ac.uk/thezone/minerals/)

US Geological Survey Mineral resources Program (http://minerals.usgs.gov/)

Minerals that are Useful to our present-day civilization (California State University-Northridge)
http://www.csun.edu/~khurst/ES300/Fritche/300minerals.html#III

Encyclopaedia Britannica "Mineral Deposits"
http://www.britannica.com/EBchecked/topic/383726/mineral-deposit

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