

INSPIRE GK12 Lesson Plan



Lesson Title	The Earth and the Elements
Length of Lesson	One (50 minute) class period
Created By	Charlotte Buehler
Subject	General Science
Grade Level	7 th grade
State Standards	7 th : Inquiry (1d), Physical Science (2a)
DOK Level	DOK 3
DOK Application	Compare, Determine
National Standards	5-8: Inquiry (A), Physical (B)
Graduate Research Element	Understanding how the elements in the periodic table play a role in real life is critical to understanding concepts such as soil chemistry.

Student Learning Goal:

MS 7th Grade:

Inquiry- (b) Organize data in tables and graphs and analyze data to construct explanations and draw conclusions.

National Science Education Standards of Content 5-8:

Inquiry (A)-- Use appropriate tools and techniques to gather, analyze, and interpret data.
Physical Science (B)—Properties and changes of properties in matter.

Materials Needed (supplies, hand-outs, resources):

Mineral rock box, black light, pie chart from *Chemistry Matters*, element chart from *Chemistry Matters*, pencil, colored pencils, computer, projector, Powerpoint (INSPIRE_Buehler_LP_Elementsppt_9_22_11)

Lesson Performance Task/Assessment:

The students will have a short powerpoint presentation (INSPIRE_Buehler_LP_Elementsppt_9_22_11) on elements and minerals. The instructor will show how elements, as the students have previously learned, can combine to form minerals. The students will learn that the earth is composed of various minerals and the students will be able to see some actual minerals (from a mineral rock box). The instructor will then have the students decipher a chart to identify the most common elements in the earth's crust. The instructor will have the class make a pie chart illustrating the percentage of certain elements in the earth's crust. Next, the instructor will show a chart depicting various earth minerals and ask the students to list the elements that the given minerals are composed of, including how many of each atom are in the mineral (e.g. $\text{CaMg}(\text{CO}_3)_2$ is 1 atom Ca, 1 atom Mg, 2 atoms C, 6 atoms O).

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Lesson Relevance to Performance Task and Students:

One building block of chemistry begins with learning about the periodic table and the elements. How those elements make up compounds and how those compounds can be classified as “minerals” is essential to comprehending the bigger picture in chemistry.

Anticipatory Set/Capture Interest:

The instructor will capture student interest by showing some different minerals...which glow under a black light! The instructor will segue to the lesson explaining how elements make up minerals (e.g. NaCl) and how sometimes an element is a mineral (e.g. C).

Guided Practice:

The instructor will begin the lesson reviewing the periodic table and the elements. The lesson will then continue to guided practice. The class will make a pie chart from information given about the percentages of the common earth elements. The instructor will then continue to explain how elements make up minerals. The minerals in the rock box can be shown for examples. Independent practice will then follow.

Independent Practice:

The students will practice identifying mineral compounds and the elements that those mineral compounds are composed of. The students will write the compound in a chart along with how many atoms of each element are included in the mineral compound.

Remediation and/or Enrichment:

Remediation- Individual IEP; work in groups

Enrichment – Ask the students to identify what minerals might be “heavier” than other minerals and explain why (in relation to the atomic structure, atomic mass, or atomic number).

Check(s) for Understanding:

Can the students interpret the pie chart they made depicting the percentage of earth minerals? Can the students compare and contrast the different elements? Can the students determine the number of atoms in each mineral compound?

Closure:

Question 1: What is a mineral? How are they related to elements?

Question 2: What is a common element found in the majority of the minerals compounds you have seen?

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Possible Alternate Subject Integrations:

Earth Science, Mathematics

Teacher Notes:

‘Chemistry Matters’. 2003. Aims Education Foundation (AIMS). Fresno, CA

-Obtain for mineral rock box:

Sulfur

Galena

Pyrite

Fluorite

Hematite

Calcite

Biotite

Quartz

-Black light

-Willemite mineral (glows)