Lesson Title	Introduction to Minerals of the Earth
Length of Lesson	One (50 minute) class period
Created By	Bo Cherry
Subject	General Science
Grade Level	7th grade
State Standards	7th: 1 c (Inquiry); 4 a,b (Earth and Space Science)
DOK Level	DOK 3
DOK Application	Separate, Compare, Relate, Make Observations
National Standards	5-8: A (Inquiry); D (Earth and Space Science)
Graduate Research Element	Minerals are the building blocks of rocks. They provide essential nutrients for life, building material, etc. Minerals also find their way into surface waters and impair the quality of some waters.

Student Learning Goal:
MS 7th Grade:
(Inquiry) 1 (c) Collect and display data using simple tools and resources to compare information; (Earth and Space Science) 4 (a) Justify the importance of Earth materials (e.g. rocks, minerals, atmospheric gases, water) to humans.

National Science Education Standards of Content 5-8:
(Inquiry - A) Abilities necessary to do scientific inquiry; Use appropriate tools and techniques to gather, analyze, and interpret data; (Earth and Space Science - D) Structure of the Earth System

Materials Needed (supplies, hand-outs, resources)
Computer, Projecter, Handouts (INSPIRE_HO_Cherry_02.01.12), several mineral kits (number depends on availability and how students are grouped), hand lenses, scratch plates, small bottle of acid (HCl), electronic scale, graduated cylinder (large), nail, glass plate

Lesson Performance Task/Assessment:
This lesson will guide students through the identification and classification of some common minerals. The students will be responsible for identifying all minerals on their

own based on their observations. A table will be supplied to them, so they can easily fill out their observations in order to deduce which mineral is which. Each item on the table is explained, and an example mineral is investigated as a class. Depending on the time required for the students to identify the minerals, this lesson could be divided into two class periods, in which case, one class period would be devoted to introducing the students to the methods, and the next lesson devoted to completing the table.

Lesson Relevance to Performance Task and Students:
The mineral identification lesson will be made relevant to the students by showing some common minerals that they may find in their day-to-day lives. Minerals such as calcite can be found extensively throughout the Columbus area. It will be important to research this in other parts of the world for other schools. Also, providing students with common instruments, such as a nail and glass, gives the students an opportunity to investigate the properties of various minerals they may find. It shows the students that you don't have to have the fancy equipment to perform scientific investigations.

Anticipatory Set/Capture Interest:
The students will be intrigued for several reasons. First, going to the lab is always one way to excite students. Also, displaying several unknown minerals is intriguing for students. Finally, showing students pictures of everyday objects that are made of various minerals from around the world will get students excited about the lesson (see Teacher Notes).

Guided Practice:
An example mineral will be investigated as a class. Each property, after being defined and discussed, will be investigated. It may be appropriate to call on students to verify the observation (example: show the class that the mineral galena has a metallic luster, then have a student come and verify that observation).

Independent Practice:
Students will work in small groups to complete the table (INSPIRE_HO_Cherry_02_01_12). The instructor should be moving about the lab to ensure that all students are participating in order to get individual practice with the exercise.

Remediation and/or Enrichment:
Remediation- Individual IEP; Fill in some of the blanks on the table for the students
Enrichment - Have students find examples of some of the minerals discussed in the lesson at home and write what they found in a journal. If possible, have them perform the tests to ensure that it is the correct mineral.

Check(s) for Understanding:
Formative and summative feedback will be essential in order to check for students' understanding of the material. A completed table should be submitted, which will serve as summative feedback, and formative feedback will be provided by the students throughout the laboratory exercise.

Closure:
Question 1: Why are minerals important to humans? List three reasons.

Question 2: How do we find the relative hardness of a mineral? What is the hardness of a nail? What is the hardness of glass?

Possible Alternate Subject Integrations:
Chemistry, Physical Science, Earth Science

Teacher Notes:
There are 15 slots on the table, but it is not necessary to use every slot as 15 minerals may not be available. Also, instructors may want to fill in all of the mineral names prior to the lab, and allow students to fill in the properties during the lab. If this is done, it is recommended to add a few "mystery" minerals for the students to identify based on their prior observations.

Anticipatory set:
See lesson at
http://www.geosociety.org/educate/lessonplans/Earth_Materials_in_Subaru.pdf and show pictures of a Subaru as an example of minerals in a car.

AND/OR

http://geopubs.wr.usgs.gov/open-file/of01-360/of01-360.pdf