

## Rockin' Detectives Post Activity

Assessment  
Cross-curricular

identification

### Big Ideas

- Rocks and minerals have unique characteristics and properties that are a result of how they were formed.
- The properties of rocks and minerals determine society's possible uses for them.

### Learning Goals

- To be able to use the rock and mineral identification skills learned in the DE school program to make identifications in the "real world".

### Specific Expectations

#### Grade 4 Rocks & Minerals

- 2.1 follow established safety procedures for outdoor activities and for working with tools, materials, and equipment
- 2.2 use a variety of tests to identify the physical properties of minerals
- 2.3 use a variety of criteria to classify common rocks and minerals according to their characteristics

#### Grade 5 Conservation of Energy & Resources

- 1.1 analyse the long-term impacts on society and the environment of human uses of energy and natural resources, and suggest ways to reduce these impacts

#### Grade 6 Space

- 3.1 identify components of the solar system, including the sun, the earth, and other planets, natural satellites, comets, asteroids, and meteoroids, and describe their physical characteristics in qualitative terms

### Description

The aim of this post activity is to reinforce the concepts learned in the Rockin' Detectives school program by using their new skills to make identifications of unknown "rocks". Students can also see how what they learned is actually useful in the real world and gives them greater knowledge of the world around them.

### Materials

Pennies (or small pieces of copper)  
Nails  
A piece of glass  
White (and if possible black) unglazed tiles (can be obtained from a home renovation store)

Magnets  
Vinegar, Pipettes (if possible)  
Magnifying glasses (if possible)

### Safety Notes

Where safety goggles. Caution with vinegar.

---

## Introduction

### Recap

- What is the difference between a rock and a mineral?
  - A mineral is a naturally occurring substance, which is pure in content (meaning it has a specific chemical composition).
  - A rock is an aggregate of minerals (a number of minerals having formed a mixed structure)
- Minerals have specific physical properties. We can use those to help us identify them either in pure content or as part of a rock.
- Did and/or learned about a number of tests on minerals at Dynamic Earth to determine what they were:
  - Hardness test
  - Streak test (what colour is a streak that we make with the mineral?)
  - Fluorescence (does it glow under UV light?)
  - Magnetism (is a magnet attracted to it?)
  - Electrical Conductivity (does it conduct electricity?)
  - Cleavage (Does the mineral break along flat planar surfaces?)
  - Effervescence (Does the mineral react to an acid?)

### Discussion of today's activity

Today we will use our newfound skills to try to identify minerals we can find in our everyday life here at school and/or at home.

- Can we do any of the tests listed above with tools that we have here in our classroom or even at home? Yes. Discuss:
  - Can test hardness with a fingernail, penny, nail, glass plate – we have that!
  - Streak test can be done with black and white unglazed tiles – we have that!
  - Fluorescence is a bit harder. We may not have a UV light available.
  - Magnetism can be tested with a simple magnet – we have that!
  - Electrical conductivity is harder again. We may not have a setup to test it.
  - Cleavage we can do by just looking at the structure of minerals – but it may not be possible if it has been modified (e.g. shaped into something).
  - Effervescence we can do by using pickling vinegar – we have that!

---

## Action

### Find “rocks” to test

- In order to increase the variety of minerals that students can test we recommend that you instruct students to look for samples at home as an assignment before this lesson.
- Students can also find things around the school now for testing.
- Ideas on what items they can look for:
  - drywall pieces, metal pipes (copper, aluminum, steel, etc.), clay pot pieces, pieces of gravel, any ornamental rocks that may be available from the yard or even a nearby outdoor space, pencil led (graphite), cutlery

## Test the materials

- Once you have a good assortment of things to test have the students perform the identification tests on them.
    - Try to scratch the sample with your fingernail. If that fails with a penny, then a nail, and finally try to scratch glass with the sample. See below for hardness chart to get a hardness range for the sample.
    - Try to create a streak on a black (for light samples) or white (for dark samples) tile. Record the colour.
    - Hold a magnet up to the sample. Does it stick? Record result.
    - If the sample allows (most of the time it may not) look for cleavage and use the reference chart to determine what it is.
    - Drip a few drops of vinegar onto sample. Does it start to bubble? If you don't see anything, try looking with a magnifying glass. Bubbles may only be forming very slowly. If bubbles form then the sample has carbonate mineral content (calcite or dolomite).
  - Use the accompanying worksheet to fill out the results for each item.
  - Use the attached identification chart or your own chart to compare the worksheet results to and make a guess what each material might be.
- 

## Consolidation/Extension

### Consolidation

Minerals are all around us. Sometimes in pure form and more often as part of materials we use. We can identify minerals in various ways.

### Extension – Analyze the mineral content of household items

This is a different approach to the lesson plan we present here, but it gets at the same thing: that minerals are present throughout our daily lives and we can identify them and learn just how they are used. Instead of using tests to identify minerals though we use our research tools to figure out what minerals are in household items.

### Basic approach:

- Recap what a mineral is with students.
- Discuss some examples of mineral use. There are some obvious examples, such as tiles, cutlery, and countertops. Students may not be aware though just in how many places we find minerals, such a cosmetic products, in electronics, etc.
- Some things have ingredients listed on the packaging. Look at the ingredients and identify any minerals. Students may have to look up the ingredients to learn whether they are minerals or not.
- Some things do not have the ingredients listed. For these students can do research to learn what minerals are in them.
- Presentation:
  - For example you could have each student pick ONE household item and research what mineral are in it. They could further research where this mineral comes from, how it is mined and processed. They can then present their findings in class in an oral (or written) presentation.

- Possible reference websites:
  - <http://www.mineralogy4kids.org/minerals-your-house>
  - <http://www.nma.org/index.php/minerals-publications/40-common-minerals-and-their-uses>
  - <http://www.pbslearningmedia.org/resource/ess05.sci.ess.earthsys.mineralenv/minerals-in-our-environment/>