

Teacher reflections, ideas, and resources

1. I set up my classroom with 8 minerals in a box. Before I had that many sets, I just had student groups pass around minerals to another group as they finished making observations.
 - a. The minerals I use are: graphite, galena, chalcopyrite, hornblende, hematite, magnetite, pyrite, bauxite, sulfur, talc, calcite, biotite mica, muscovite, mica, halite (I do not let my students “lick” my salt rocks. If they feel it might be salt (halite), they just need to ask and I let them know yes it is or no it’s not.), gypsum, dolomite, fluorite, apatite, hematite, the feldspars, olivine, and quartz.
 - b. Included in the mineral box are a few streak plates, black and white, a staple (for magnetic minerals), an iron nail, a glass plate.
 - c. I did not include any acid as I have had kids treat the acid dangerously. If a student wants a drop of acid they raise their hand and I place a single drop onto the mineral. Students have tissues to wipe off the acid. I now use diluted HCl but have used vinegar. Vinegar just happens to have a smell I don’t appreciate, but it is much safer. That being said, HCl has a cooler reaction if a mineral effervesces.
2. You will notice that I have set up the mineral ID table to include a shaded and a non-shaded portion for each mineral. When students first examine their samples, I have them write down their own observations without any input from other students. This helps with the “freeloading” student, who just sits back and relaxes while others discuss the lab. Also, students get a chance to take their own “educated” guess as to what each mineral is. Once each student has tried their best to identify the mineral, they then compare and “debate” their answers. Students will then get to choose which person in the group has the best answer and can justify it. A student can pick the group’s consensus or take a chance and keep their answer.
3. As students begin this lab, I go over all the important information and activities found here
 - a. **Day one: [Mineral Classification part 1](#) lecture and discussion**
 - i. I have created groups of images to show the different lusters, metallic and non-metallic
 1. **Common** problem and discussion:
 - a. Understanding metallic and non-metallic minerals are where kids go wrong first. When a student asks me the difference between them, I always tell them that if it doesn’t look like iron, gold, or silver, it is non-metallic. The problem with this is that some kids define “silver” as shiny, so I have to keep reiterating that just because a mineral is shiny doesn’t mean it is metallic.
 - ii. They learn what streak is and see examples
 - iii. There are images of what cleavage looks like
 - iv. At the bottom of the site, I have students streak their minerals in their mineral kit.
 - v. At this time I also have students determine what luster their minerals have.
 - vi. They also determine whether their mineral has good cleavage, excellent cleavage, or none.
 - vii. NOTE: Clicking on images from the site will zoom in to the image.
 - b. **Day two: [Mineral Classification Part 2](#) lecture and discussion**
 - i. Teach Mohs Scale of Mineral Hardness. Students then test their minerals for hardness.

- ii. Then we discuss unique mineral properties. I have created an image found on the site, with examples of some cool mineral properties. If you have a black light and some minerals that glow, this is a great wow factor. I go through each unique property and have students test the properties of their samples.
 - 1. This is where I run around with a dropper of acid and they wipe it off with a tissue.
 - 2. Students will see if minerals have any magnetic properties by trying to pick up the staple in their kits..
 - 3. Students will check for particular feels, smells, and ask me if a mineral is salty.
 - a. (I do not let my students “lick” my salt rocks. If they feel it might be salt, they just need to ask and I let them know yes or not.)
 - 4. They check to see if they have double refraction on any minerals.
- iii. I also have the students do what I call the “hefty” test. A mineral that is heavy for its size or really dense, can usually be a metallic mineral. The key shows the specific gravity of each mineral. If that number is large then the “heftier” the mineral would be.
- iv. During all of these tests, they are recording on their sheet their observations.

c. Day 3: Practice using a Dichotomous Key

- i. Now that students have filled out the mineral ID sheet by themselves, it is time to teach how to use a dichotomous key. I have students complete another worksheet without using real minerals that practice the use of a dichotomous key. You can find this activity here. <https://www.teacherspayteachers.com/Product/Mineral-ID-Dichotomous-Key-Practice-3197977>
 - 1. This activity also helps students understand the vocabulary that will be used on the mineral key for this activity.
 - 2. I have found that students feel much more comfortable with the mineral identification lab of actually identifying real minerals if they practice using a dichotomous key first. This has saved me quite the headache.

d. Day 4: Identify your mineral in the kit

- i. I use the following mineral dichotomous key that I created based on other charts I have seen. It is based on the minerals I actually have them testing. I have a few distractors in the key, but most of the minerals on the key, I have actual samples in their kits Students can go to: <https://earthscience.xyz/mineral-dichotomous-key> if they do not want to print it off. If you want to print off the key you can click here. [Mineral Dichotomous Key Google Doc](#)
- ii. I do print this key off for every student. I have found using a printed versus a digital is easier for most students to use. Both work fine though.
- iii. First students individually follow the dichotomous key and make an educated guess as to what all their minerals are. They make their individual guess in the gray portion.
- iv. Next, students will share their answers with their groups and “debate” their findings and observations. They can now decide to keep their first choice or go with another choice that somebody else in the group had.
- v. Because the minerals are numbered, I keep a key with the correct answers on a clipboard. When kids have discussed with their groups the answers and have made their guesses in both the gray and light boxes, they then come up to me and ask me if they got the answers right. I quickly use a highlighter to mark the incorrect answers and let them try one more time. I also give them an idea as to where they might have gone wrong. After they have tried to follow the dichotomous key again and have made another selection, I collect the papers and this will be their final grade.