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# Using Your Mineral Kit

*40 ideas to get you started!*

Congratulations on your new collection! First, we recommend reviewing the educational videos and background information about the 15 geological items that were included in your mineral kit by visiting minerals.ysu.edu/mineral-kits/. Afterward, consider doing any of the following:

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- Check Color

This is a simple one: look at each of your minerals and see what color it is. Take it one step further and do an online search to see if other specimens of that mineral are always the same color (for example, all sulfur is yellow) or if it comes in a variety of colors (for example, fluorite can be many different colors).

- Check Hardness

Some minerals can be very hard and some can be very soft. Try scratching a mineral with your fingernail. If you were able to scratch it with a fingernail, it is considered very soft! With an adult's help, you could try scratching your mineral next with progressively harder items, like a penny, knife, steel nail, and drill bit. Or, if you don't have these items, you can scratch one mineral on another. The harder mineral will leave a scratch on the softer mineral. In this way, you could line up your minerals in relative order of hardness. Note: you could have more than one mineral with the same level of hardness.

- Check Specific Gravity

You can measure the specific gravity of your minerals at home if you have a small scale, cup, and paperclip (check out this external link for instructions and photos: http://www.johnbetts-fineminerals.com/jhbnyc/articles/specific_gravity.htm). However, if you just want to get an idea for specific gravity, you could hold the mineral pieces in your hands and gage how heavy or dense they feel to you.

- Check Luster

Stand by a lamp, near a bright window, or step outside on a sunny day. Move your mineral around in the light and describe how the light appears to reflect off the mineral. Take it one step further and try to label each mineral by the type of luster it shows. For examples, check out this Wikipedia page which has example images for different types of luster: https://en.wikipedia.org/wiki/Lustre_(mineralogy)

- Check Diaphaneity

Test each mineral to see if light can pass through it. There are 3 options for each mineral: transparent, translucent, and opaque. Usually transparent minerals are pretty easy to spot since you can see right through them, but sometimes it can be hard to tell if a mineral is translucent or opaque. If you have a mineral that looks like it is opaque, try shining a flashlight directly on it. You might get surprised!

- Check Magnetism

If you have a small refrigerator magnet at home, see if you feel any pulling/pushing forces when you hold it near your minerals.

- Check Streak

If you have an unglazed porcelain tile at home, you can scratch your minerals on it to see what color powder they leave behind as a streak. Be sure to do this with an adult and always leave the tile on a table while you scratch it; if you are holding the tile in your hands and scratch really hard you could break the tile and hurt your hand. If you don't have a tile you can use, you could try scratching your minerals on a driveway or sidewalk or some old pottery (e.g. a flower pot).

- Check for a Reaction to Acid

If you have some diluted hydrochloric acid lying around, feel free to put a tiny drop on each mineral (with an adult's help) to check for bubbling. If you don't have hydrochloric acid, you could try using a weaker but more readily available acid, like vinegar.

- Memorize your Minerals

After you've looked at them for a while, can you name them without looking at the labels? Test yourself and see if you can memorize all 15. Once you can remember the names and what they look like, you can start to test your identification skills in the real world. Which brings us to…

- Go for a Nature Walk

Get some fresh air in your backyard, at a park, or other outdoor area, and see if you can find any rocks. Pick them up and look at them closely. Do you notice certain colors, shapes, textures? Is there anything in the piece you are holding that looks similar to any of the mineral pieces in your kit? Can you tell if you are holding a rock, or a mineral, or something else? We don't encourage taking geological pieces from other places without permission, but consider taking photos of your rock. Later, you can look online and try to figure out what it was that you found!

- Look up Mineral Name Origins

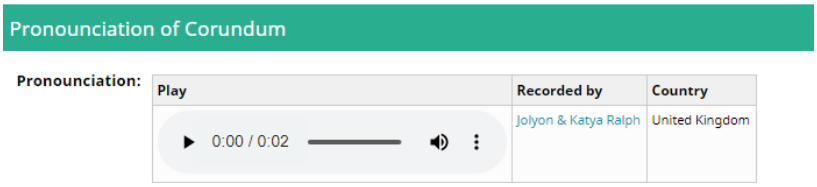
All minerals are named after something. Sometimes they are named after the person who discovered them. Sometimes they are named after the place they were discovered in. Sometimes they are named based on the elements in their formula. In our opinion, some of the best mineral names are ones that are based on words from ancient languages. For example, cobaltite is named after the Greek word for goblin! Look up the origins of your minerals' names and see what you find.

- Check out Mineral Databases

There are several online mineral databases, such as mindat.org or minerals.net. Look up your minerals on these databases. Often times you will find a large gallery of photos for each mineral. See how your mineral piece looks compared to images of the same mineral on the database. While you're there, see what else you can learn about your minerals!

- Learn How to Pronounce your Mineral

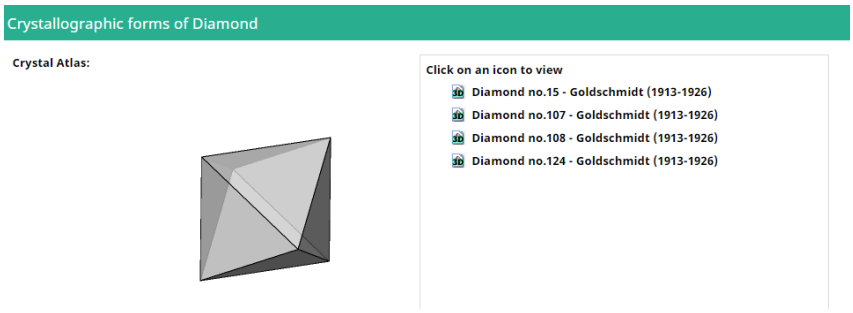
Some mineral names might look a little strange to you if you've never seen them before and you might not be sure how to pronounce them. Often times mindat.org will have a pronunciation box that will audibly demonstrate the proper way to say a mineral's name.

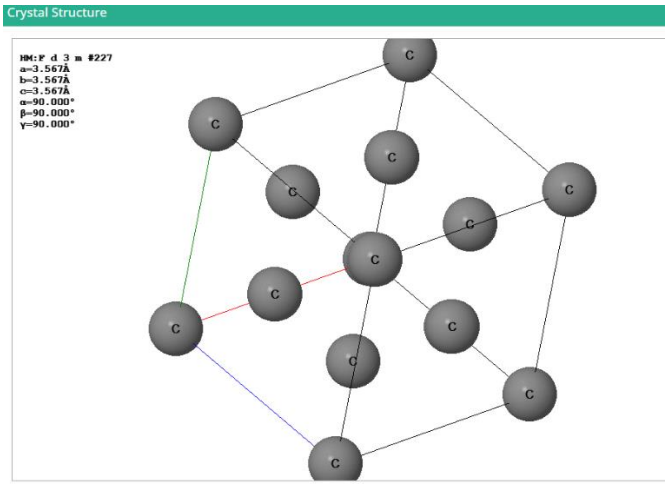



Screenshot from Mindat.org

- ## Manipulate the Crystal Forms and Structure

While on mindat.org, check out the crystallographic forms section, where you can play around with various crystal forms of your mineral. If there is more than 1 form listed, click around the options to see which form you might have in your kit (keeping in mind the form might not be noticeable in your mineral piece for a variety of reasons). You can also check out the internal crystal structure of your mineral just below. Try moving it around, zooming in and out, and turning on the labels to see which circles represent which elements.




Screenshots from Mindat.org

- ## Break your Mineral

You can test your minerals for cleavage and fracture patterns by smashing it, but be aware that once you break your mineral, it will not go back together. To break your mineral, first ask an adult to help or supervise you. Cover the mineral piece you want to break with a towel or something that will keep small mineral pieces from flying all over the place. With a rock hammer or whatever hammer you have, see if you can hit the mineral hard enough to cause it to break. Check the breakage to see if you notice fractures or cleavage. Remember, cleavage is a break along a flat surface.

- ## Check Fluorescence

Do you have a blacklight at home? Most blacklights are actually long wave ultraviolet lights. If you have one, try holding your minerals under it to check for glowing. If you don't have a blacklight you could try taking them with you the next time you play laser tag, putt putt, or skate at a location with blacklights. Don't notice glowing? Only about 15% of minerals will fluoresce. And some of those minerals will only fluoresce under short wave ultraviolet lights.

- Research Ancient Uses of your Mineral

Depending on when and where your mineral was discovered, you might find that ancient people had some interesting uses for it! Maybe it was used for jewelry. Maybe it was ground up into a pigment and used for paints or makeup. Maybe it was used as a medicine. See what you can discover! Take it one step further and see if you can determine if any of these minerals are still used in the same way today.

- Research Modern Uses of your Mineral

Minerals are not only fun to learn about and collect, but many minerals have very important uses. We use minerals every day. Minerals are in our food, medicine, the walls of our home, our coffee cups, makeup, glasses, countertops, toothpaste, fireworks, pencils, matches, sandpaper, wires, coins, frying pans, and even smart phones! See if you can find some modern uses of the minerals in your collection. Take it one step further and see if you can find minerals listed as ingredients in any of your products at home. Note that the ingredient name might not be the exact same as the mineral name. The Silicon Dioxide in some table salt is essentially ground up quartz (it keeps the salt from clumping together).

- Visit a Mineral Museum

Visiting a professional mineral display is a great way to view many high quality samples of mineral specimens. When you go, be sure to check and see if you can find any of your minerals in the displays. How do your minerals compare with those on display? Some local museums you can visit include:

- our museum, the Clarence R. Smith Mineral Museum, which is currently open by appointment only during Youngstown State University's academic semesters;
- The Cleveland Museum of Natural History, which has a department of mineralogy;
- The Carnegie museum of natural history in Pittsburgh, which has the stunning Hillman Hall of minerals and gems.

- Take a Virtual Tour

Several museums have created free online virtual tours, such as the Smithsonian National Museum of Natural History. If you visit the Smithsonian's virtual tour, available on their website, you can specifically choose to view the Janet Annenberg Hooker Hall of Geology, Gems, and Minerals. Take your time admiring the many specimens they have on display and again, try to find examples of the minerals from your own kit.

- Research Rock-Forming Minerals

Figure out what types of rocks (metamorphic, igneous, sedimentary) might contain your minerals. Some minerals, referred to as rock-forming minerals, are more commonly found in rocks than other minerals.

- Sketch your Mineral

Before cameras were around, geologists had to rely on making very detailed sketches of their rock and mineral collections. See if you can draw a realistic sketch of your minerals. To do this, you must really eyeball your mineral up close and look at every little feature on it. You can use a pencil or colored pencils, but anything with a fine tip will probably give you better results than something like standard markers or crayons.

- Paint your Mineral

Feeling artistic but not into highly detailed sketching? Try paints or other materials to create an artistic masterpiece based on your favorite mineral in the kit.

- Count Crystal Faces

Move your minerals around in the light. Do you notice that minerals with flat surfaces will reflect the light one surface at a time? The flat surfaces are called faces. See how many faces you can find in a mineral.

- Check for Double Refraction

If you have a transparent or clear mineral, place it over a piece of text to check for double refraction. Double refraction is when you see double of image.

- Practice Writing like a Scientist

Look closely at a mineral. Notice every little detail about it that you can. Now, write a descriptive paragraph about your mineral using only those details that you can see (don't make inferences about it, or say things that you can only guess about). You are writing about your mineral as if you were describing it to someone who cannot see it.

- Write a Poem about your Mineral

Now the opposite of writing like a scientist! Write something fun, like a poem, about your mineral. You can make generalizations or comments about it and use all the flowery language you want!

- Look Up the Chemical Formula

What is the chemical formula of your mineral? What are the elements in the chemical formula? How many different elements are in the chemical formula? Find an interactive periodic table online such as this one: https://www.chemicool.com/ and click on the elements that are in your mineral to learn more about them.

- Make Jewelry

People have used minerals to make jewelry for a very long time. Are there are pieces in your kit that you would like to wear as jewelry, or gift to someone else? Look online for inspiration. Some people like to wrap minerals or rocks in wire and then attach them to necklaces, rings, bracelets, and earrings. Some people like to use a rock tumbler or saw to change the shape of the pieces before using them in jewelry. Be sure to get an adult to help you if you choose to do something like this. Not into jewelry? You can also make a keychain!

- Moon Minerals

Look up the names of minerals that have been found on the moon. Do any of these minerals match yours?

- Scientist Biography

See if you can find information about the person who discovered your mineral. Make a short story, book, comic, etc. about the life of this scientist.

- Fossil Minerals

Fossils are primarily composed of minerals. Typically, the most common minerals in fossils are calcite and quartz. Look online to see if you can find examples of fossils that contain these minerals, and see if you can find any examples of other minerals that have been found in fossils.

- Look Up Birthstones

Each month of the year has been assigned one or more minerals as birthstones. If you do not know your birthstone, look it up! Then check to see if any of the minerals in your kit are birthstones.

- Smell your Minerals

Some minerals are known for having a distinct odor, such as sulfur. Take a little sniff and see what you think! Sometimes the smell might be the strongest after a little piece is broken off. Or if it's been sitting in its bag, try smelling the inside of the bag.

- Mineral Songs

Can you think of songs that mention rocks or minerals in the title or lyrics? An example would be "Shine On You Crazy Diamond" by Pink Floyd. Or, write your own song that uses your minerals as inspiration.

- Visit your Library

While there is always lots of information available online, it can be fun to read an old fashioned book. Check your local library to see what books they might have about any of your minerals or any books about rocks/minerals in general.

- Practice Grouping

Lay out all your minerals. Try to place them in piles, or groups, with similar colors. Now try to group them based on size. Also try grouping with texture and whatever else you can think of. This is a great activity for little kids to do.

- Visit a Local Rock Shop

If you want to expand your rock/mineral/fossil collection or just window shop, do an online search for rock shops near where you live. You could also keep an eye out for areas where you can mine for your own fossils and minerals.

- Curate your Museum

Pretend you are in charge of your own little museum. How can you store the minerals in your kit? Do you want to mount them on something and display them? Do you want to keep them in boxes on a shelf? How will you keep your collection neat, safe, and labeled? How will your storage system work if you add more pieces to your collection down the road?

- Write a Short Story

Think about how your mineral came to be and what its future might hold (for example, maybe it will become part of a rock). Write a short story about the life of your mineral.