

# MINI MINERS MONTHLY



## MINERAL FUN FOR YOUR BRAIN!

This issue has some mineral challenges that will make you think. In the end, the mineral collector who knows more about minerals will build a better mineral collection and will find mineral collecting much more rewarding.

There are a lot of minerals that most of you know by sight: galena, fluorite, quartz. But did you know that there are hundreds of minerals that you most likely will never hear of or see . . . unless you know they exist and go searching for them in museums, at shops, on the internet. There is a little activity here that will make you go to the internet to learn about some minerals we are sure you have never heard of before - like frankhawthorneite, acmite and massicot, to name a few.

Now that you are out of school, you will also have a lot of time to take care of your collection. One of the most important aspects of keeping a good mineral collection is creating a catalog of information about each specimen in your collection. You will find in this issue a creative approach to building a catalog of your specimens.

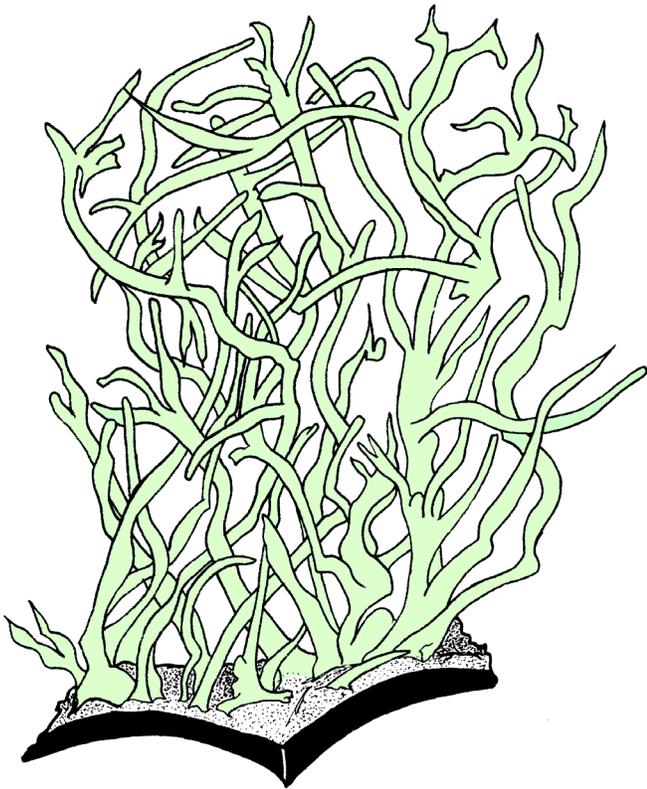
With summer also comes the fun of getting out into the field and digging in the rocks and dirt for specimens. What should you bring with you to be certain you have a successful dig? There are some answers here. Every year we also reprint the American Federation of Mineralogical Society's "Code of Ethics" because it is important that when you dig, you practice the Code. You will have more success and you will be part of the mineral prospecting community that helps assure the success of other collectors, today and for many years to come.

Throughout the summer there are MANY mineral shows held, throughout America and literally all over the world. You will find some websites listed in this issue that will help you find a mineral show near you. You will also learn why it is so important (and so wonderful) to attend as many of these shows as you can.

Lastly, we always have kids who want to color. So, there are a bunch of pages with fun mineral drawings and a couple of mineral-collecting dragons for you to color, too. Print each picture out a bunch of times, sit down with your family or friends, dump out your crayons and pencils and have a ball!

Vol. 7 No. 6  
June 2013

# MINERAL OF THE MONTH



## Aragonite



**Crystal System:** Orthorhombic  
**Luster:** Silky to Vitreous (glassy)

**Hardness:** 3.5 - 4

**Specific Gravity:** 2.9 - 3.0

**Cleavage:** Poor. Brittle.

Often fluorescent.

You are a mineral expert, so when you see the chemical formula for aragonite, you think of another very common mineral right away. What other mineral has the same chemical formula? CALCITE. Aragonite and calcite have the same chemical

formula, BUT their crystal systems are different. Aragonite is orthorhombic and calcite is hexagonal! When two minerals have the same chemical formulas but crystallize in different crystal systems, they are called

*polymorphs* which literally means *many forms*.

Aragonite is much more rare than calcite. It forms from warmer water than the waters that form calcite, like hot springs.

Sometimes aragonite is formed as intergrown branches that look a lot like coral. They were first discovered in iron mines in Germany. The minerals called them *Flos Ferri* which means *Flowers of Iron*. (Like the specimen pictured above.)

*Alabaster* is a dense, massive variety of aragonite that is easily cut and carved into ornamental and useful objects, like statues, boxes, and goblets.

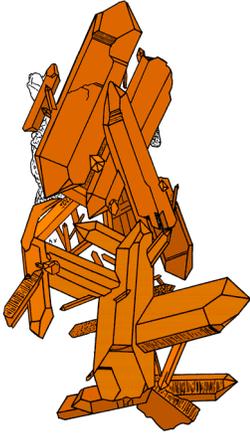
### **The Aragonite Group of Minerals**

There are a few minerals that all have a similar chemical formula and all crystallize in the orthorhombic system. These minerals are grouped together by mineralogists and are called "The Aragonite Group" of minerals. They are aragonite ( $\text{CaCO}_3$ ), witherite ( $\text{BaCO}_3$ ), Strontianite ( $\text{SrCO}_3$ ), Cerussite ( $\text{PbCO}_3$ ).

# MINERALS IN ABOUT 7 WORDS

Here's a challenge for your mineral knowledge. Write a sentence about a mineral in 7 words (if you have to, you can use more or less). The challenge is to show what you know about minerals. The first mineral, quartz, has an example. After that, it's up to you! You can do this with your family, friends, classmates or mineral club buddies.

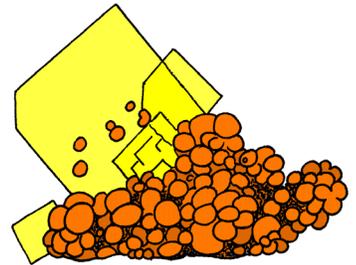
Challenge your parents or club leaders.



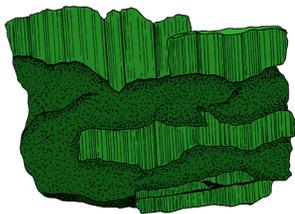
Quartz - Cold, colorful crystals that sparkle like gems.

Quartz -

Wulfenite - Sometimes thin and fragile like glass.

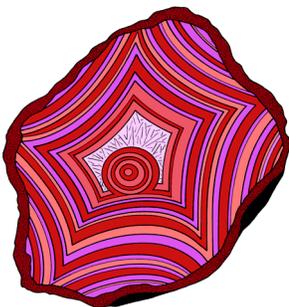
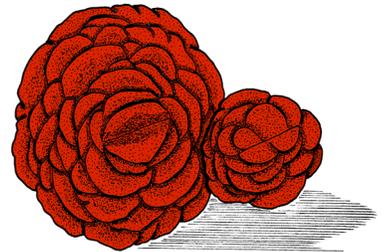


Wulfenite -

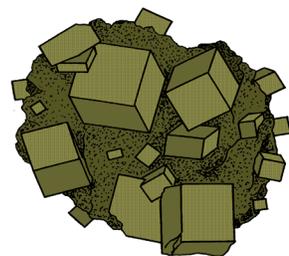


Asbestos -

Barite -

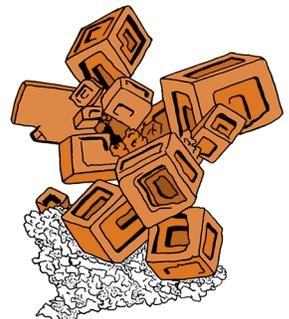


Agate -



Copper -

Pyrite -



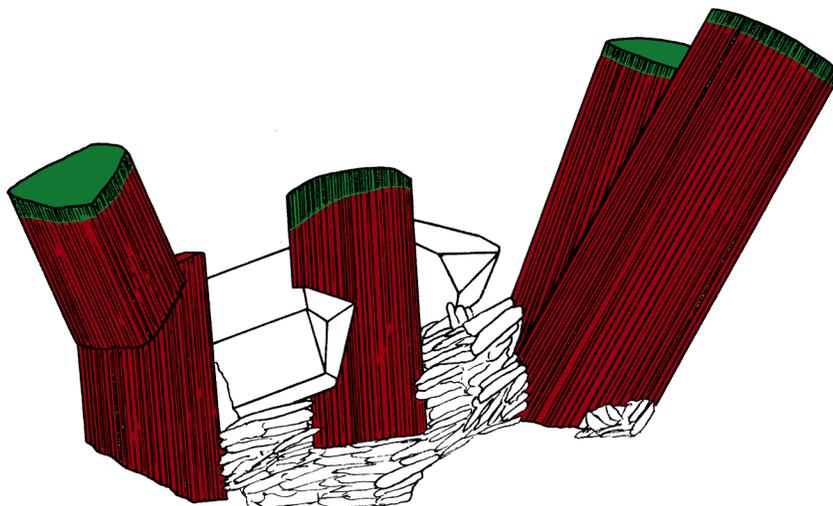
# MAKING A CATALOG OF YOUR MINERAL COLLECTION

On the following 5 pages you will find a fun approach to creating a catalog of the specimens in your collection. There are four examples and then a blank page for you to print out as many times as you wish and use for your collection catalog.

Draw a picture of your specimen in the middle of the page. You could also take a picture, print it out and paste it in place. Then, use the blank boxes to record information about the specimen.

The big box at the top is for the specimen's name. The other boxes can include any other information that you like. I chose to fill them with information about the minerals' physical properties and some other interesting facts. You might choose to record who gave you the specimen. Or, perhaps, what you paid for the specimen. In one of the boxes you could record the date on which you acquired the specimen. You might prefer to record the *value* of the specimen (remember, you may have paid \$2 for it, but you know that it is worth \$100!)

The catalog you create for your specimens should be what YOU want it to be. So, be creative. When you are done, you will have created a book about your very own collection!



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# Copper

Cu

H = 2 1/2 - 3

Metallic

Copper Red  
Color

Ductile

Sp Gr = 8.9

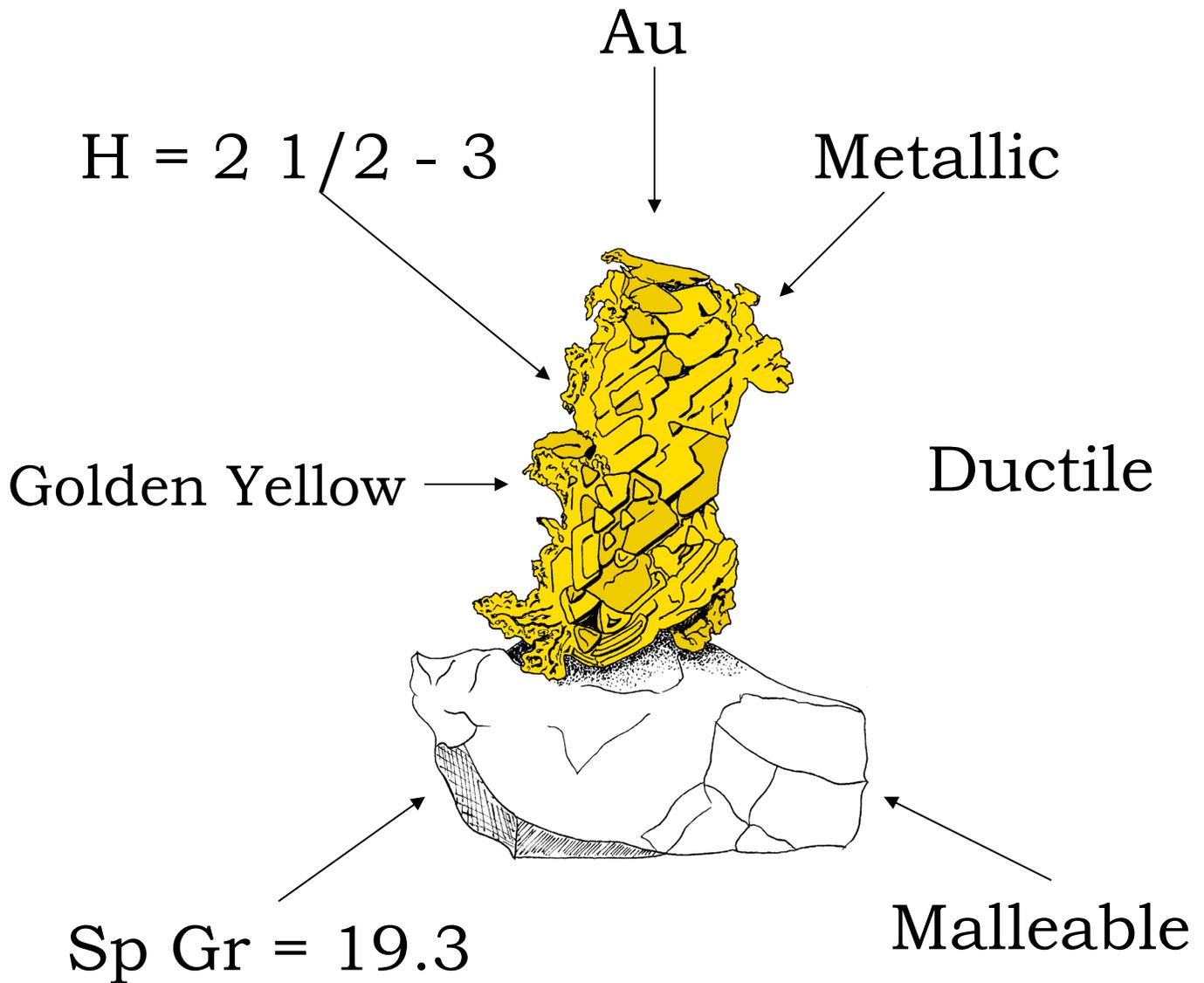
Malleable

Copper + Zinc = Brass

Copper + Tin = Bronze

**Copper Minerals:** Azurite, Malachite,  
Cuprite, Atacamite, Enargite, Chalcopyrite,  
Rosasite, Aurichalcite, Chalcantite

# Gold



## **Gold Minerals**

Aurostibite, Calaverite, Petzite, Krennerite,  
Sylvanite, Rhodite

*There are only a very few minerals that contain gold because gold is one of the most stable elements in the world. It rarely combines with other elements!*

# Silver

Ag

H = 2 1/2 - 3

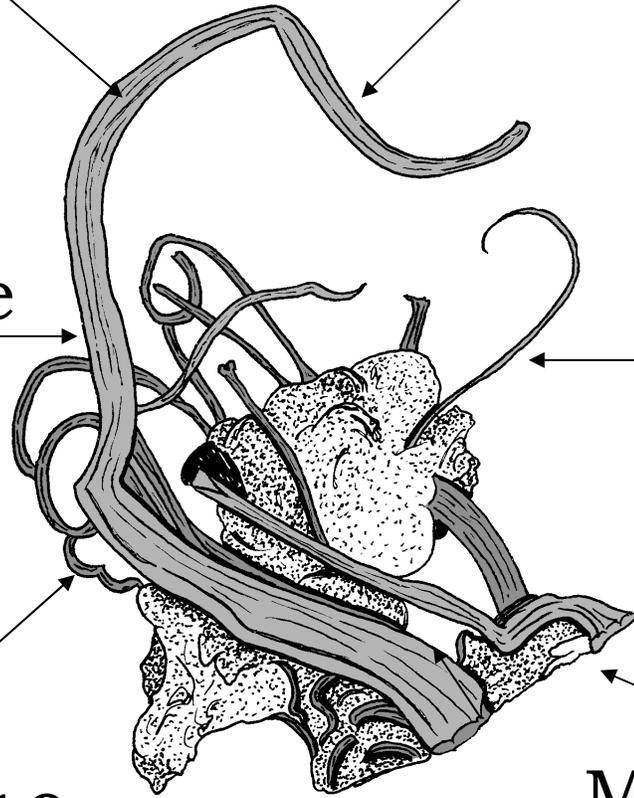
Metallic

Silver-white  
to Gray

Ductile

Sp Gr = 10

Malleable



## **Silver Minerals**

Acanthite, Boleite, Chlorargyrite, Crookesite,  
Dyscrasite, Polybasite, Proustite, Pyrargyrite,  
Stephanite, Sylvanite,

# Mercury

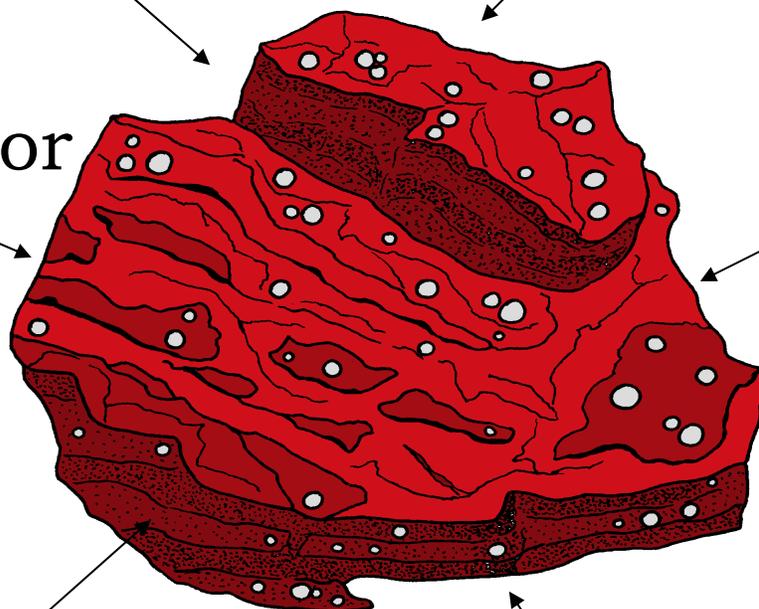
Hg

H = Liquid

Metallic

Silver Color

Ductile



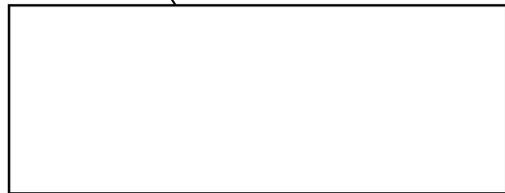
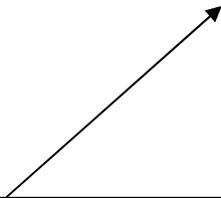
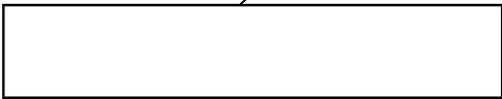
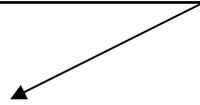
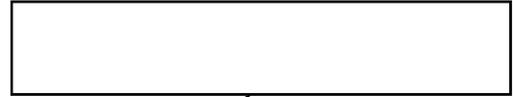
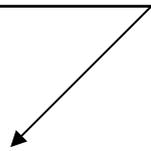
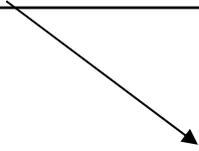
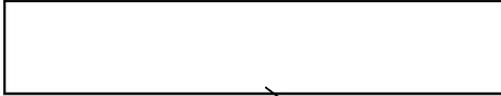
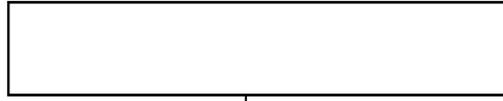
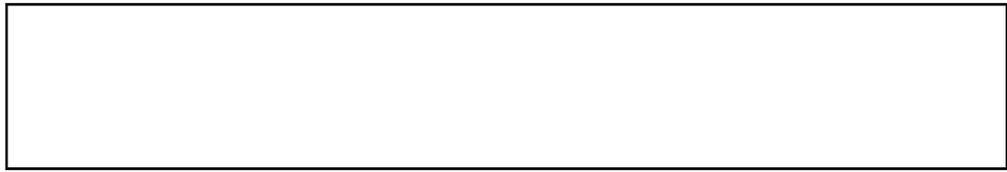
Sp Gr = 13.6

Also called  
Quicksilver

## **Mercury Minerals**

Cinnabar, Aktashite, Christite, Coloradoite,  
Livingstonite, Tiemannite

*Except for cinnabar (the main mercury ore), all  
other mercury minerals are extremely rare!*



# WHERE IS THE COPPER (AND OTHER STUFF)?

Below are sets of four mineral names in each set. Three of the four minerals contain the element listed in color to the left. Your challenge is to figure out which of the four minerals *does not* contain that element. It's really not hard - if you're willing to do a little research!

**Copper** - Frankhawthorneite, Shattuckite, Polyhalite, Covellite

**Gold** - Sylvanite, Tridymite, Calaverite, Aurostibite

**Silver** - Acanthite, Dyscrasite, Pyrargyrite, Heulandite

**Sulfur** - Pyrite, Cristobalite, Gypsum, Jamesonite

**Oxygen** - Tetrahedrite, Hematite, Sodalite, Bixbyite

**Aluminum** - Grossular, Chrysoberyl, Acmite, Vesuvianite

**Iron** - Eudialyte, Franklinite, Boulangerite, Staurolite

**Lead** - Phosgenite, Ilmenite, Massicot, Jamesonite

**Carbon** - Dolomite, Uranophane, Malachite, Diamond

**Zinc** - Alunite, Hydrozincite, Legrandite, Willemite

# TIME TO GO DIGGING !!!

Summer is just about here. School will soon be out and you will be itching to go out into the field and start digging for minerals and crystals. Before you go, you will need to gather up some equipment to be successful.

Whenever you go digging for minerals, keep this one word in your mind:

## SAFETY

Too many collectors are hurt in accidents because they didn't prepare properly and didn't have the right equipment. This is so important that many mineral clubs actually have a "safety chairperson" who will ask members to leave a dig site if they do not have the right safety equipment.

Start to collect for yourself a toolbox of tools and safety equipment. Here is a list of safety equipment you will need:

--**Safety Goggles.** They protect your eyes from flying chips of rock and sometimes pieces of tools that break! They can be purchased at most "dollar stores" and hardware departments.

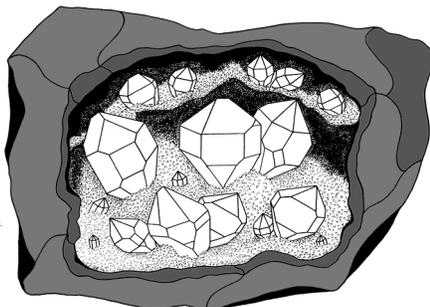
--**Hard Hat.** Protect your head from falling rocks.

--**Boots.** When you prospect for minerals in a quarry, where large rocks can move and roll, you need to protect your feet. Boots, with steel toe guards, can save you from a broken foot or toe.

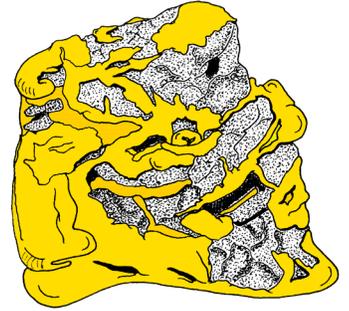
--**Leather work gloves,** or something of similar quality to protect your hands from cuts, scrapes and other injuries. A lot of hands and fingers have been bruised and broken by rock hammers.

--**A First Aid Kit.** A simple first aid kit is necessary. Include band aids, antibacterial ointment, an ace bandage, butterfly bandages, gauze pads, first aid tape, instant cold pack, sharp scissors, hydrogen peroxide, acetaminophen or ibuprofen, alcohol wipes, 2 pairs of plastic gloves, flashlight and extra batteries, a blanket (enough blankets for everyone on the trip, just in case!) You may even want to get on the internet and search for more information about First Aid Kits.

--**Cell Phone.** To call for help if necessary.



In addition to these safety items, there are other items that you will want to have with you.



--**A Friend.** Never collect alone. It is always a LOT more fun to go rock collecting with a special friend. In case of an emergency, one person can help the other or send for help.

--**Long Pants.** Long pants protect the legs from falling and rolling rocks and flying chips of rock.

--**Long-Sleeved Shirt.** Protect your arms, too.

In the summer wear *light-colored* and *light-weight* clothing so you don't get overheated and sick.

--**Plenty of Food and Water for Everyone!!**

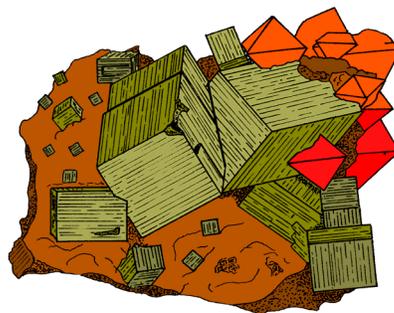
You will be surprised by how much water your body needs to function well and be healthy, especially when you are working in the sun. Bring bottled water and drink often. **Never drink water from pools, puddles or rivers.** You can get sick from this water. Eat and drink often.

--**Warm Clothing.** Just in case the weather turns windy and cold, have some warm clothing in the car. You may not need it, but it is better to have it with you.

--**Insect Repellent.** Bugs, bugs, bugs. Black flies, mosquitoes and gnats. They'll try to chew you up alive! Bring plenty for everyone.

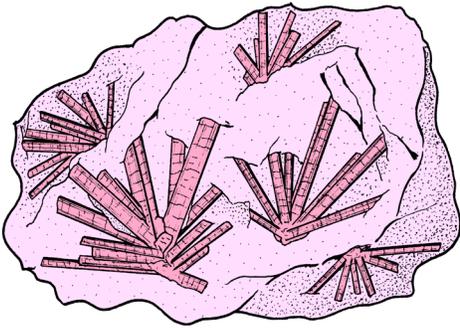
*No mineral specimen is worth losing an eye, breaking a leg, or getting crushed under a rock. Be careful. Protect yourself and everyone digging with you. Going home uninjured with some great specimens that you found*

*yourself can be one of the best feelings in the world. Have a happy and safe summer of digging and collecting.*



# MINERAL COLLECTOR'S

## CODE OF ETHICS



Everyone who is a member of a mineral club or society that is part of the American Federation of Mineralogical Societies (AFMS) promises to follow the Federation's "Code of Ethics." These are the rules we follow whenever we go out in the field to collect minerals (and fossils, too). Read, learn, and practice these items and you will have successful and rewarding digs year after year. Whether you are a member of an AFMS club or not, these rules are important to follow.

- \*I will respect both private and public property and will do no collecting on privately owned land without permission from the owner.**
- \*I will keep informed on all laws, regulations or rules governing collecting on public lands and will observe them .**
- \*I will, to the best of my ability, ascertain the boundary lines of property on which I plan to collect.**
- \*I will use no firearms or blasting material in collecting areas.**
- \*I will cause no willful damage to property of any kind such as fences, signs, buildings, etc.**
- \*I will leave all gates as found.**
- \*I will build fires only in designated or safe places and will be certain they are completely extinguished before leaving the area.**
- \*I will discard no burning material - matches, cigarettes, etc.**
- \*I will fill all excavation holes which may be dangerous to livestock.**
- \*I will not contaminate wells, creeks, or other water supplies.**
- \*I will cause no willful damage to collecting material and will take home only what I can reasonably use.**
- \*I will practice conservation and undertake to utilize fully and well the materials I have collected and will recycle my surplus for the pleasure and benefit of others.**
- \*I will support the rockhound project H.E.L.P. (Help Eliminate Litter Please) and will leave all collecting areas devoid of litter, regardless of how found.**
- \*I will cooperate with field-trip leaders and those in designated authority in all collecting areas.**
- \*I will report to my club or federation officers, Bureau of Land Management or other authorities, any deposit of petrified wood or other materials on public lands which should be protected for the enjoyment of future generations for public, educational and scientific purposes.**
- \*I will appreciate and protect our heritage of natural resources.**
- \*I will observe the "Golden Rule", will use Good Outdoor Manners and will at all times conduct myself in a manner which will add to the stature and Public Image of Rockhounds everywhere.**

# WHY MINERAL SHOWS ARE SO IMPORTANT

by Darryl Powell

Throughout the summer months, mineral clubs and societies have many mineral shows where you can see some of the best specimens in the world on display and even purchase specimens for your own collection. There are many great shows produced by professional companies as well. Is there a show near your home? To find out, go to one of a number websites that list rock, gem, mineral and fossil shows across the country. Here are a few:

<http://www.mineralfest.com/calendar.html>

<http://www.the-vug.com/vug/vugshows.html#.UcEPJ-eKeSo>

<http://www.mindat.org/eventlist.php>

Here are some good reasons why it is extremely important to go to shows if you want to be a successful mineral collector.

1. You will meet people and make friends. The people you meet at mineral shows are eager to share their knowledge. Introduce yourself to the dealers. Ask questions. Learn from other collectors. Most importantly, make friends. You will find that your mineral collecting friends will be friends for life. They will teach you, share specimens, give guidance, and more. Find the time to visit and talk with people. Learn from their stories and their experience. You will eventually have something to share with them, too.
2. You will see hundreds of different mineral specimens in person. One of the best ways to learn about minerals is to see them and study them in person. Look at their color, their size, their texture, the other minerals associated with them. It's almost like going to a museum.
3. You can buy specimens for your collection. There are specimens in every price range, from less than a dollar to thousands of dollars. Having specimens at home gives you the chance to study them closely. It is one thing to read about a mineral in a book. It is another to hold it in your hand and look at the details of the specimen.
4. Shows usually have educational displays to teach about different aspects of minerals. One of the best displays I ever saw was all about pyrite. I never knew pyrite came in so many shapes and sizes . . . until I saw that display.
5. At mineral shows you will see the new specimens that were discovered in the past year or so. I like to go to the same show every year for a number of years. Each year the dealers have specimens that were recently discovered. Also, dealers will sometimes have *old* specimens that were collected many years ago and are now available again. You can see some classic specimens that are only seen when they come out of an old collection.
6. Many mineral shows have hands-on activities like polishing minerals on lapidary equipment, displays of fluorescent minerals, mini mines for kids, lectures and presentations.

I hope you make the time to go to at least one show this summer. Attending minerals shows is a "must do" for all mineral collectors. By the way, nearly every mineral show I have attended has also had fossil displays and dealers, too.

*Left: The East Coast Gem, Mineral & Fossil Show, held every August in Springfield, Massachusetts*



# MINERAL MUSEUMS

Before this summer is over, every serious mineral collector *must* find a good mineral museum to visit. One of the best ways of learning about minerals is seeing some of the best specimens ever discovered. And many of the world's best mineral specimens are in mineral museums. Follow this link for a long list of mineral museums that can be found all over the world. They are arranged by country. I have discovered that it is not unusual for links to not work (web pages are constantly changing!). If you find a museum near you, Google it for an up-to-date website address and up-to-date information about when to visit, times of tours, special exhibits, etc.

<http://www.minerant.org/museums.html>

What should you do when you go to a mineral museum?

1. Bring a digital camera, notebook/sketchbook, pencil, eraser.
2. Look at all of the displays. Slowly, carefully, walk through the museum to see all that you can see. Enjoy the sights. Soak in the colors, the shapes, the sizes of all the different minerals. Most museums arrange their specimens by chemical groups (like native elements, silicates,
3. carbonates, etc.) Many have special displays of minerals from certain mines. Read the educational signs that are placed throughout the museum. There is so much to see and learn!
4. Now that you have enjoyed the collection and have walked through once, walk through again. This time take pictures of anything that is interesting and beautiful to you. If you need to, keep a list of your pictures in your notebook. Mark down the mineral name and where it was found. Also make a note of anything that you find particularly interesting about that specimen. I often make notes about specimens that are similar to specimens in my personal collection. This helps me know my own collection even better.
5. Draw pictures of some of the minerals. Drawing pictures forces you to look very carefully at the specimens. When you look carefully at a specimen, you will learn more about the mineral's crystal form, about the relationships between its crystals faces, and about the relationships between different minerals that occur in one specimen.
6. Above all, HAVE FUN, HAVE FUN, HAVE FUN. LEARN, LEARN, LEARN. HAVE FUN.



**[www.diamonddanpublications.net](http://www.diamonddanpublications.net)**

# Rock & Mineral Scavenger Hunt

By Emma Fajcz

Since school is out, there's lots of time to spend learning more about rocks and minerals. Here is a rock and mineral scavenger hunt about how minerals are used in everyday life. The object is to find the item described or take a photograph of it. This can be done individually, with a sibling or friend, or in teams at a mineral party. Have fun!

Choose from: Graphite, asphalt, lead, fluorite, zinc, the zeolites, tungsten, clay minerals, tin, soda ash, gypsum, diamond, mica, gold, copper, steel, limestone, talc, silver, chromium, quartz, granite and silica. *Note:* One of these minerals is used twice.

## CLUES

1. I am in the kitchen. I can be inside cabinets or hanging up. I might be in pots or gelatin molds. I conduct electricity and heat very well. I am \_\_\_\_\_.
2. I am in the bathroom. I am usually stuck inside a drawer. I am a key ingredient in a pasty substance that you use each day. I am \_\_\_\_\_.
3. I am in your laundry room. I help you scrub your sinks and tubs sparkling clean. I am a group of minerals called the \_\_\_\_\_.
4. I am in your living room. I help brighten up your house even when it is dark. I have the highest melting point out of all metals. I am \_\_\_\_\_.
5. I am in your family room. I help your computer or game console run properly. I am a yellow metal, rare, and valuable. I am \_\_\_\_\_.
6. I am in your dining room. I might be in a china cabinet or on the table. You use me to eat on fancy occasions. I might be tarnished. I am \_\_\_\_\_.
7. I am in your home office. I am white and easily crumbled. My white surface eventually gets drawn, written, or printed on once I have been processed. I am \_\_\_\_\_.
8. I am in your pantry or cupboard. I am a metal that keeps preserved food contained, safe from germs and air. I am \_\_\_\_\_.
9. I am probably found in your basement. I help you paint your walls and trim. I am a major component of many minerals. I am \_\_\_\_\_.
10. I am the hardest substance in the world. I sometimes occur in good enough quality to be cut and faceted into beautiful jewelry. I may be found in a jewelry box or on your mom's finger (or maybe your dad's!). I am a \_\_\_\_\_.

11. I am in your bedroom. I am found as an element and number 1 on the hardness scale (along with talc). I am used in pencils. I am \_\_\_\_\_.
12. I am in your attic. I help insulate your house all through the year. I am an ingredient in fiberglass. I am \_\_\_\_\_.
13. I am in your garage. I may be in a box or hanging up. I help people by keeping their tools and hardware from rusting. I am a gray metal. My name is \_\_\_\_\_.
14. I am on your front porch. I am usually found in metal house numbers, since it is difficult for me to get rusty. As a result, I am good for outdoor use. I am \_\_\_\_\_.
15. If your family owns a cat, I could be on your back porch. Since I can absorb moisture well and minimize odors, I am used in the kitty litter. I am a group of minerals called the \_\_\_\_\_.
16. I might be found on the exterior of your house. After I have been baked or fired, I do not absorb water and help keep your house warm. I am usually shades of red or brown. I am a group of minerals called the \_\_\_\_\_.
17. I am in your back yard. I am an ingredient in a durable substance used to make flowerpots, lawn furniture, toys, and numerous other items. I am a mineral that sometimes occurs in formations called "books." I am \_\_\_\_\_.
18. I am in your driveway. I am a dark gray or black mineral that looks like obsidian. I am used to make roads and shingles, too. I am \_\_\_\_\_.
19. I am found in your sidewalk. Mixed with clay and gypsum, I make a hard and durable surface once I fully dry. I am found in cave formations, too. I am \_\_\_\_\_.
20. I am in your front yard. I keep your mail safe from the weather. I am usually mounted on a post. I am \_\_\_\_\_.
21. I am in your flower beds. I am made of pebbles usually in different shades of gray. I improve the drainage of the soil when it rains or gets wet. I am \_\_\_\_\_.
22. I am in your shed. I may be found in a fishing tackle box or in ammunition. I am a very dense and heavy gray metal. I am \_\_\_\_\_.
23. I am in your vegetable garden. I help your plants grow tall and strong. I am also used to make sheetrock for walls. I am \_\_\_\_\_.
24. I am in your playhouse. Look through a window—you will clearly see me. I am also a common mineral that occurs in many different colors. I am \_\_\_\_\_.

# Solutions

1. I am copper.
2. I am fluorite, which is used to make fluoride, that is in toothpaste.
3. I am the clay minerals used in cleaning supplies.
4. I am tungsten. Since I don't melt easily, I am used in light bulb filaments, which can get very hot.
5. I am gold. I am used in interior computer parts because I am easy to form into wires and I conduct electricity well.
6. I am silver.
7. I am talc. Along with other minerals, I am added to wood pulp to make paper.
8. I am tin. I coat the aluminum in the tin cans that are used for canned foods.
9. I am silica.
10. I am a diamond.
11. I am graphite. I am an excellent lubricator once ground into a fine powder.
12. I am soda ash.
13. I am zinc. I coat your tools in a process called galvanization.
14. I am chromite, from which the rust-resistant metal chromium is made.
15. I am the zeolites.
16. I am the clay minerals.
17. I am mica. Since I am an ingredient in plastic, you see me a lot!
18. I am asphalt.
19. I am limestone.
20. I am steel. I am iron ore mixed with tungsten and other metals and am used widely in manufacturing and construction.
21. I am granite.
22. I am lead. I weigh roughly 708 pounds per cubic foot!
23. I am gypsum.
24. I am quartz in silica or quartz sand, which is melted down to make glass.

**Scoring:** Here you can calculate your scores using the solutions key above. I hope that you did well!

22-24 correct: Awesome job! You know a lot about minerals.

19-21 correct: Great work! Keep expanding your knowledge of minerals.

16-18 correct: Way to go! With a little more practice, you should be able to get a perfect score.

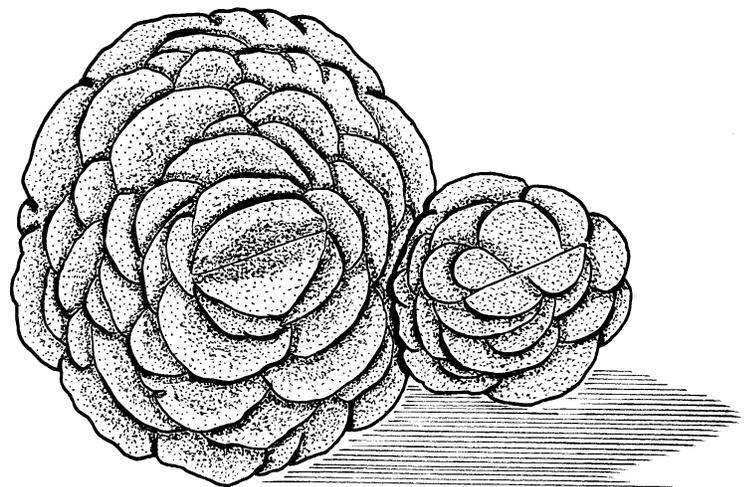
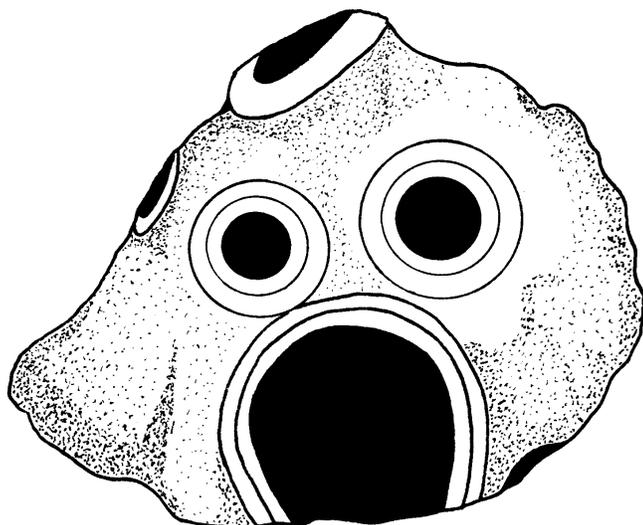
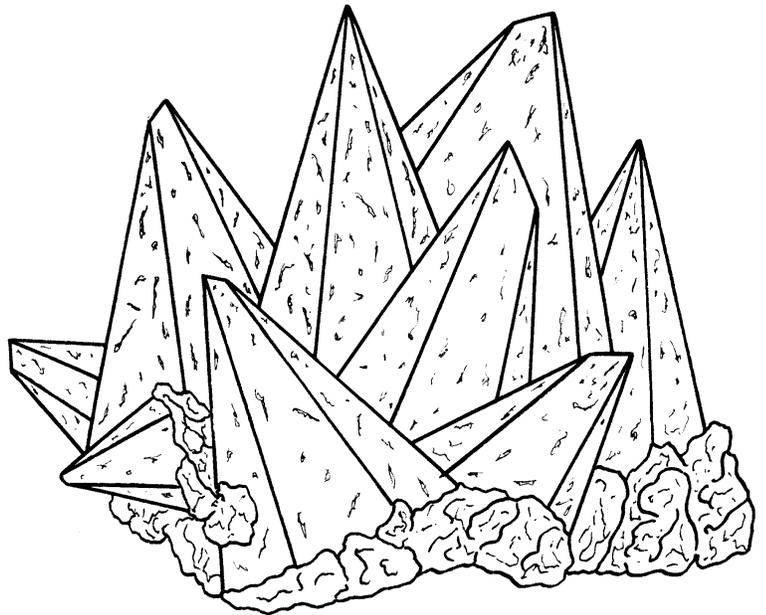
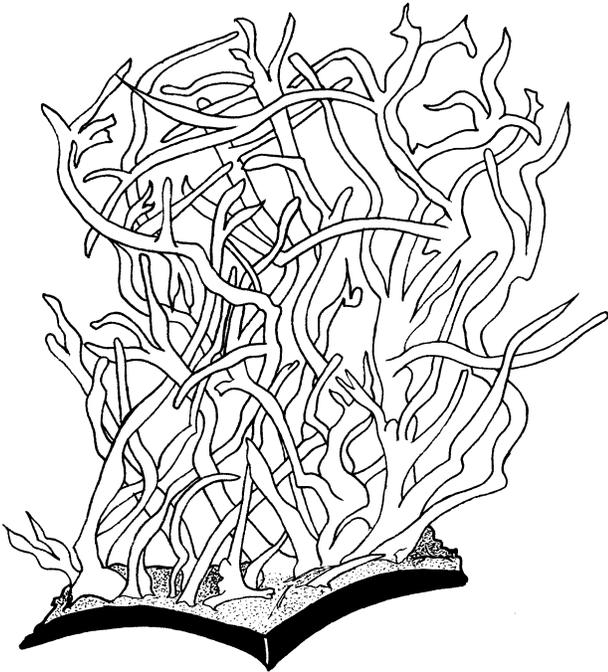
13-15 correct: You did wonderful! Research more about minerals used in everyday life. Keep trying!

12 or less correct: Wow! You are off to a good start. After brushing up on minerals that are used in everyday life, you could try testing your increased knowledge by redoing this scavenger hunt or trying a different one from online. You're bound to do amazing!

*Thank you for participating in this mineral scavenger hunt. I hope that you had fun and learned a lot at the same time. Have a great summer vacation!*

# MINERALS TO COLOR

Did you know that the grown-up collectors color mineral drawings?! There's something about coloring a good picture that is just a load of fun. So, for the youngest *and* the oldest mineral enthusiasts, here are some mineral pictures to color! Enjoy!



A dragon clutching mineral specimens from China. You can color the dragon any color you like! Here is one suggestion.



Another dragon collecting minerals. Once again, it is completely up to you to decide what color the dragon should be!

