

MINI MINERS MONTHLY

VOL. 7 NO. 12 A Monthly Publication for Young Mineral Collectors December 2013

IT'S A SEASON FOR GIVING!



Create a mineral puzzle or crossword or word search? We are always eager to include your work in future issues. (And we offer payment of \$25 for each article or item that is chosen to be used in a future publication.)

Way back in 1990, we created our first mineral activity and coloring book. It went through a number of improvements and editions and sold 50,000 copies or more (we kind of lost track after a while). For this season of giving, we have decided to make this book available to our Mini Miners. That is why this issue of Mini Miners Monthly is 44 pages long. Yes, we are giving it to you. It comes with the agreement that you can use it for your own fun and learning, but we ask that you don't make copies to sell to others.

This issue also starts with another fine article by our regular contributor, Emma Fajcz. The way minerals inspire creativity and thoughtfulness in Emma is inspiring. May minerals and mineral collecting inspire creative things in you, too.

Do you have any questions about minerals and mineral collecting? Is there a topic you would like to see here in an issue in 2014? Would you like to write an article for an upcoming issue? Draw mineral pictures?

Selected Sketches: Some Minerals from My Collection

By Emma Fajcz

This month, I did three mineral drawings, each of a different specimen from my mineral collection. I'll share the story behind how I acquired each one and some facts about irradiation.

I purchased this irradiated smoky quartz at the Gem and Mineral Show in Jacksonville, Florida this September. I wanted to buy this piece because of the beautiful crystals and colors in it. I also was curious what "irradiated" meant.

The Mineral & Gemstone Kingdom website says irradiation is "The act of being exposed to radiation. This has an effect on several gemstones by altering their natural color."¹ Topaz, tourmaline, beryl, and calcite are some minerals that can be irradiated.²



Crystal Cluster by Emma Fajcz, 3" by 2" permanent marker, graphite pencil, and colored pencils



Striped Agate by Emma Fajcz, 2½" by 2¼" permanent marker and graphite pencil.

At the same Gem and Mineral Show this year, my Mom, my sister, and I were digging through a box of very reasonably priced polished specimens and slabs of minerals. Since I was thinking the lines in this specimen would make an interesting drawing, I preferred this one over the others. This mineral, semitransparent in spots, is in shades of gray, milky white, taupe, and brown and was originally a gray/white banded agate nodule before it was cut into a slab and polished.

This specimen drawn below is composed of smoky quartz and amazonite crystals that grew on rock. Mr. Stephen Phillips, a family friend, gave this piece to me in 2010, when I was starting my mineral collection. Mr. Phillips, a gemologist, has many beautiful mineral specimens at his home, and I was very grateful to receive this nice piece. I like the interesting texture of the rock, the muted colors, and the biggest smoky quartz crystal in the center of the specimen.



Smoky Quartz and Amazonite, by Emma Fajcz, 4 $\frac{1}{2}$ " by 3 $\frac{1}{2}$ ".
permanent marker, graphite pencil, and colored pencils

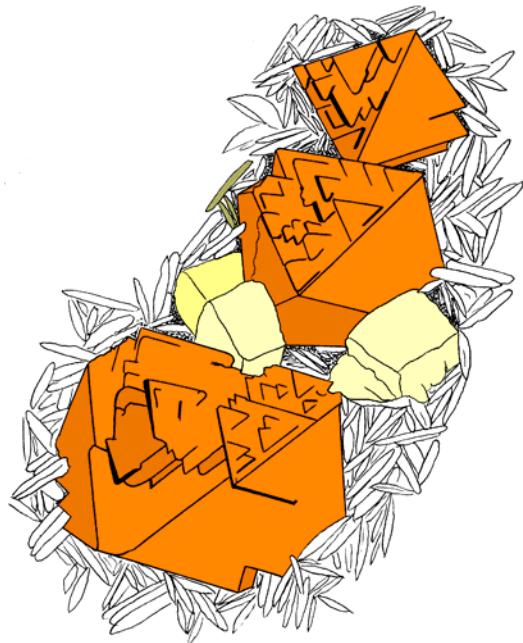
I store the irradiated smoky quartz specimen in its original box, complete with a label and soft padding. The gray/white banded agate has been kept in a small, clear plastic bag with the other specimens we bought at the Jacksonville Show this year. I usually keep the smoky quartz and amazonite piece in one of my cardboard rock boxes.

Footnotes

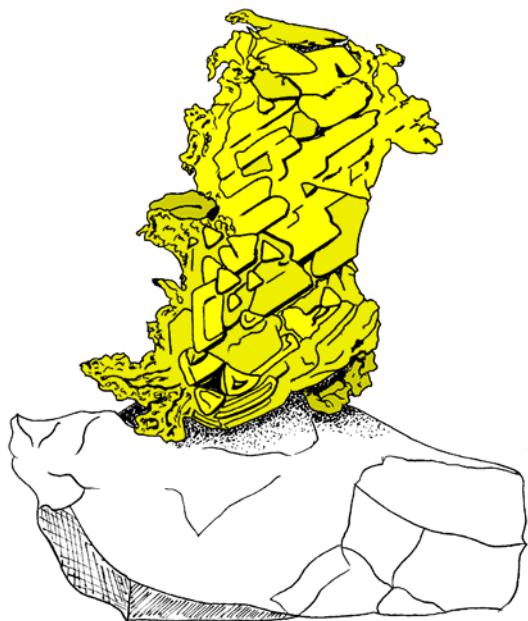
Found on http://www.minerals.net/mineral_glossary/irradiation.aspx: accessed on December 1, 2013

Found on http://minerals.gps.caltech.edu/COLOR_Causes/Radiate/index.html: accessed on December 1, 2013

The World of Minerals & Crystals

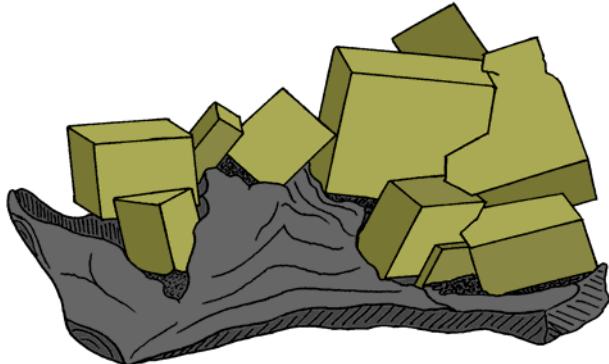


Scheelite, an ore of tungsten

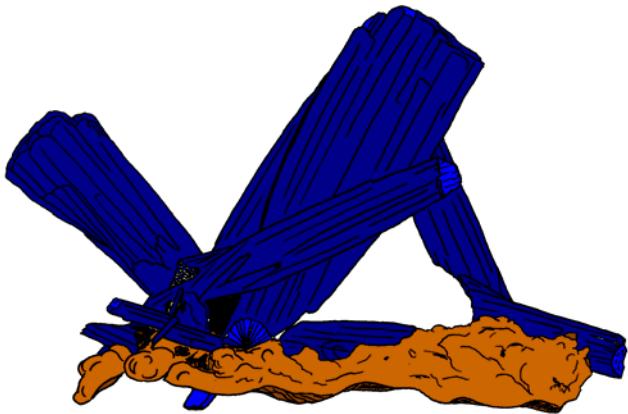


Natural gold

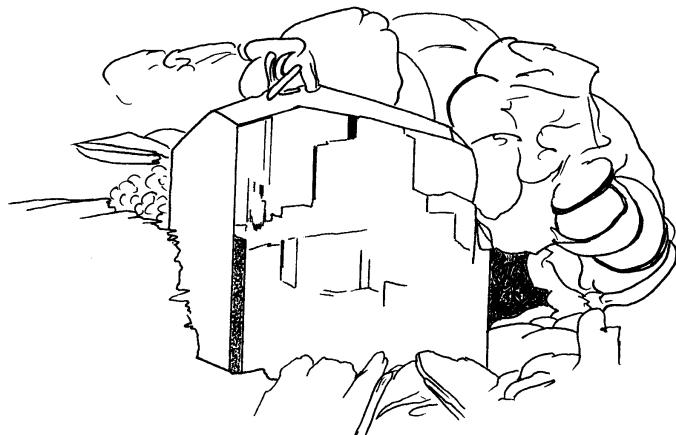
TheIR PROPERTIES, FORMS and USES



Pyrite cubes, an ore of iron and sulfur



Azurite, an ore of copper



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ISBN 0-9678163-5-1

Another production of:

Diamond Dan Publications
278 Howland Avenue
Rochester, New York 14620
(585) 278-3047

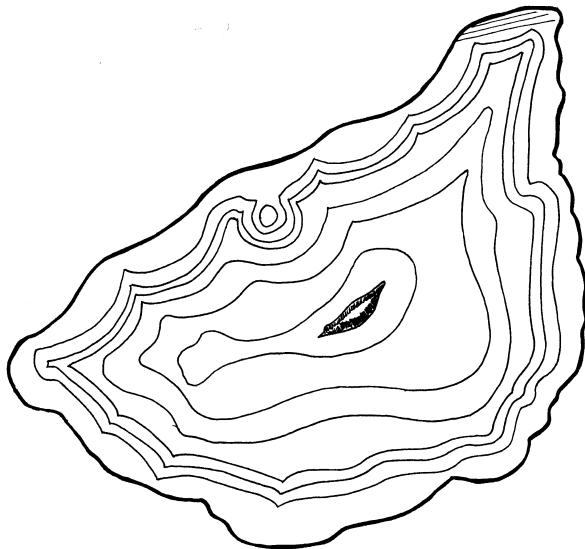
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A is FOR . . .

. . . Agate

Agate is a variety of the mineral *quartz*. It's beautiful colors and patterns make agate a favorite of collectors. Color each band a different color (red, white, blue, black, orange, brown, gray.)

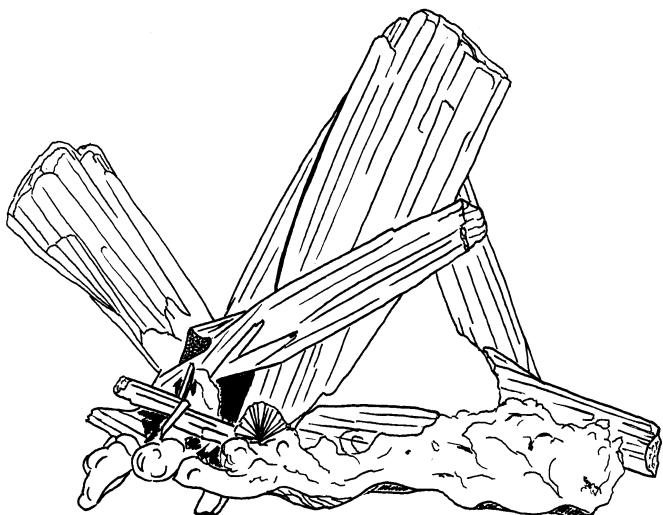
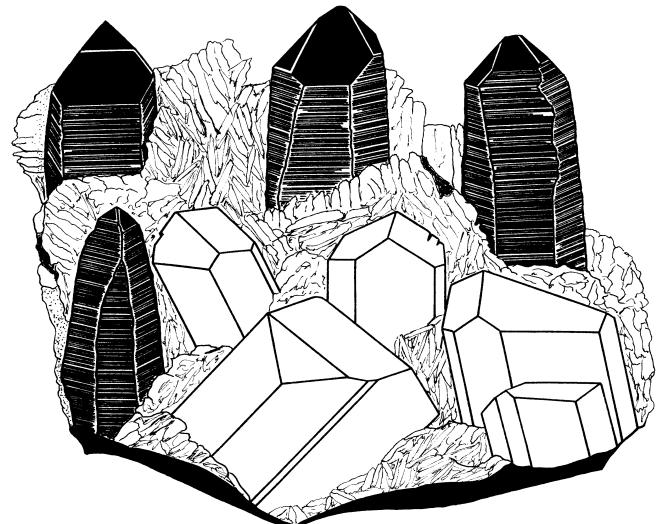


*An agate slice
from Brazil.*

. . . Amazonite

Amazonite is a variety of the mineral called *feldspar*. It is green and is polished to make jewelry.

Three green amazonite crystals with a large, black smoky quartz crystal in the back. From Colorado.



. . . AZURITE

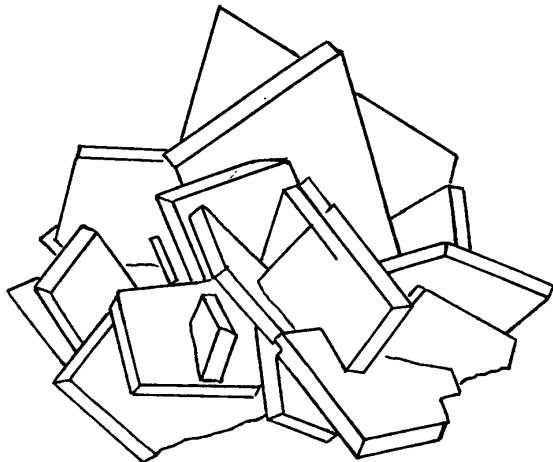
Azurite is a beautiful blue mineral. Its name comes from the word *azure* which means *blue*.

Dark blue azurite crystals from Tsumeb, South West Africa.

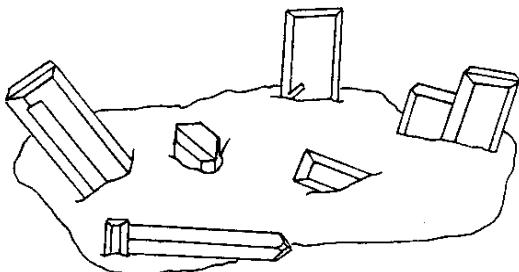
B is FOR . . .

. . . Barite

Barite is a very heavy mineral. This makes it useful in drilling for oil. Its name means *heavy*. Barite can be white, brown, yellow and red.



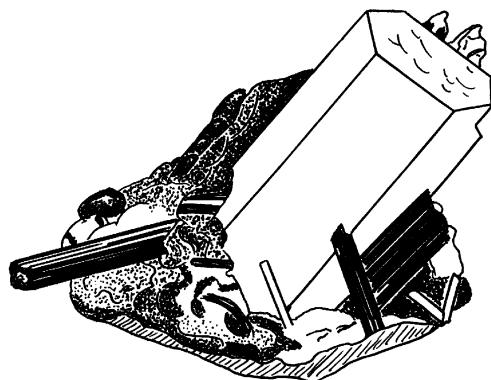
Yellow barite from Nevada.



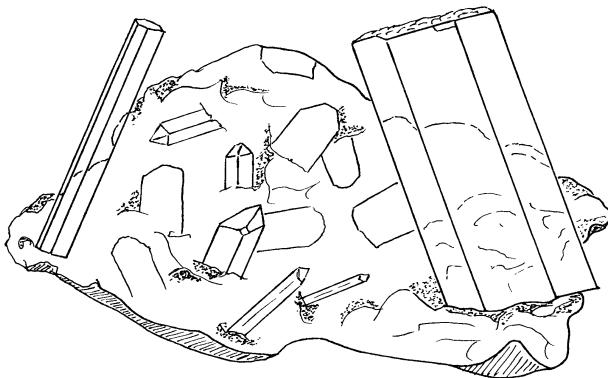
Gray-blue barite crystals from Colorado.

. . . Beryl

Beryl is found in many colors. Each color variety has a different name. Here are two:



Light blue aquamarine with black tourmaline from Namibia, Africa.



Two yellow *heliodor* crystals with quartz crystals from Russia.

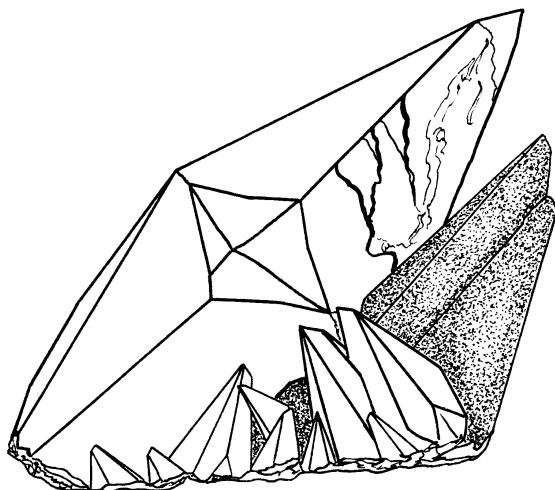
C is FOR . . .

. . . Calcite

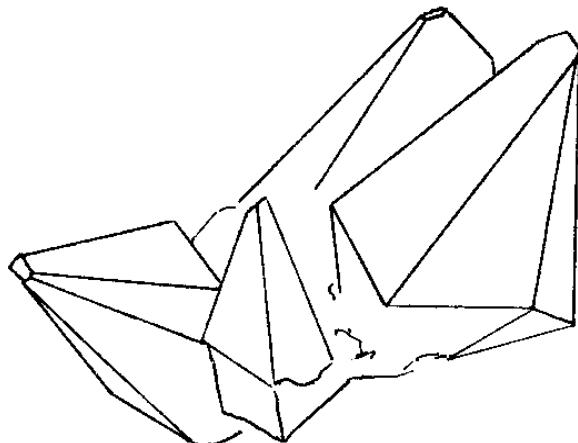
Calcite can be found in many shapes and many colors. These calcite crystals to the right are golden brown, but calcite can also be green, blue, red, yellow, black, tan, white, and colorless. Calcite is used to make cement, fertilizers and some special chemicals.



Calcite with copper inside from Michigan.

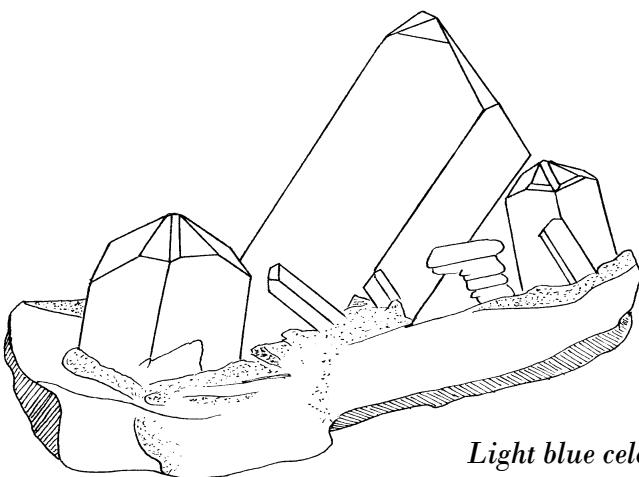


Gray calcite from Missouri



“Dogtooth” calcite crystals from Oklahoma. They are called “dogtooth” because they look a little like a dog’s fangs!

. . . Celestite



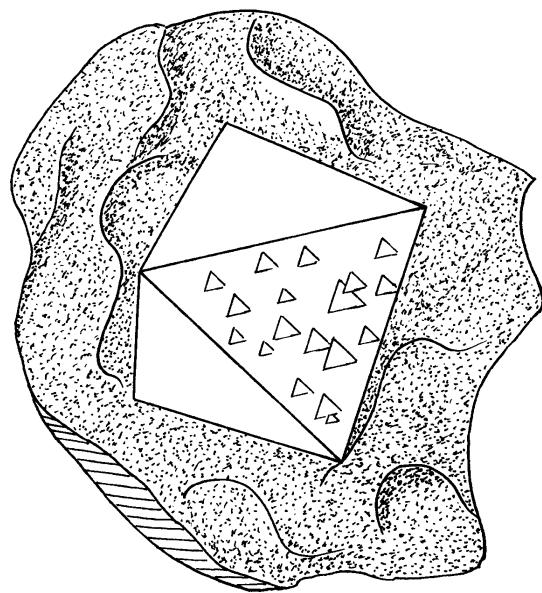
Light blue celestite crystals from Madagascar.

Celestite has an element in it called *strontium*. Strontium is used in fireworks to make a pretty, bright red color. However, celestite itself is light blue, yellow, white or colorless.

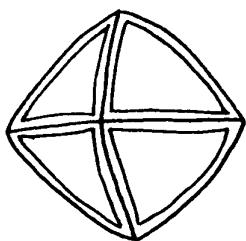
D is FOR . . .

. . . Diamond

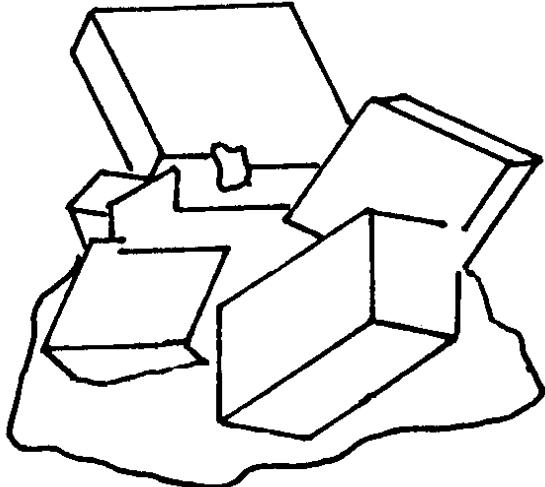
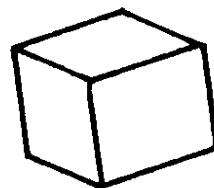
Clear diamonds are very valuable and are cut for jewelry. Most gem diamonds are colorless, but “fancy” diamonds are blue, yellow, green, and rarely, red. The diamond is the hardest substance on earth! Diamonds that are not clear enough to be gems are used in drills and saws to cut through rock.



A diamond crystal from South Africa. It is sitting in a type of rock called “blue rock.”



To the left is a diamond crystal with rounded faces from South Africa. To the right is a box-shaped diamond crystal called a cube.



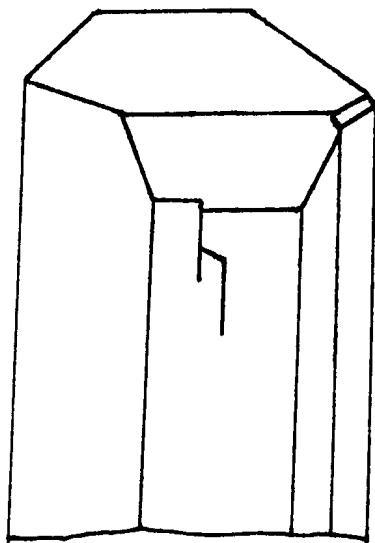
. . . Dolomite

Dolomite crystals look like boxes that have been squashed to the side. These crystals are called *rhombohedra*. Usually, dolomite is white, but it can also be pink, brown, or yellow. It is used in the process of making steel from iron ore.

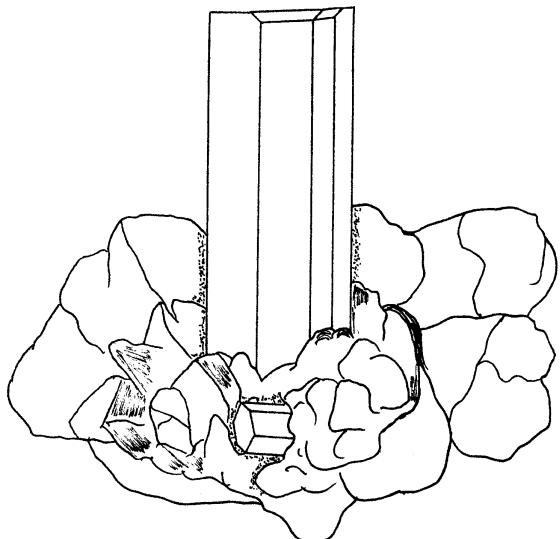
Dolomite crystals from New York.

E is FOR Epidote

Epidote is a beautiful, dark green, glassy mineral. Sometimes it is used for making jewelry. When a mineral looks like glass, it has a *glassy luster*. Other minerals, like pyrite or gold, look like metal and are said to have a *metallic luster*.



A single epidote crystal from Alaska.

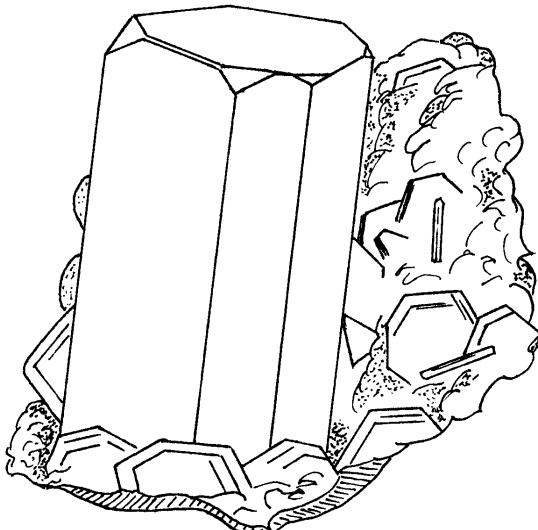


(Above) A dark green emerald on gray calcite from the Cosquez Mine, Colombia, South America.

(Right) A light green emerald on tan mica from Russia.

. . . EMERALD

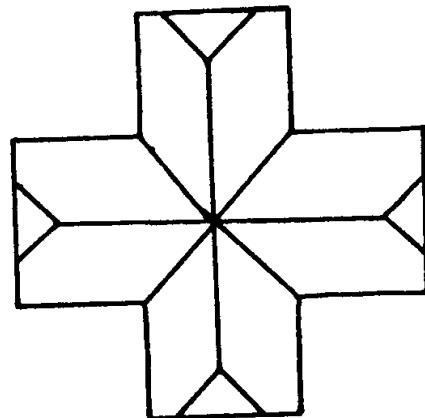
Emerald is the green variety of the mineral *beryl*. It is a very popular and beautiful gemstone. High quality emeralds are more valuable than diamonds!



F is FOR . . .

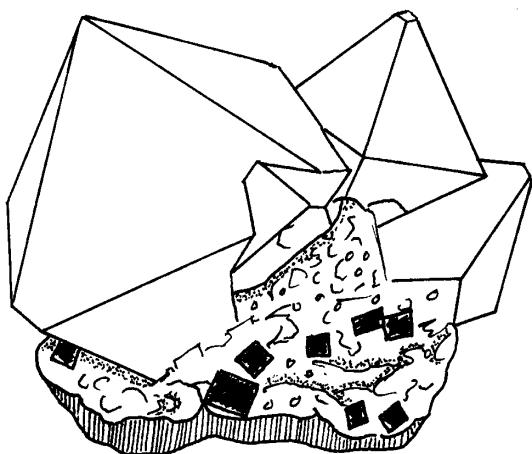
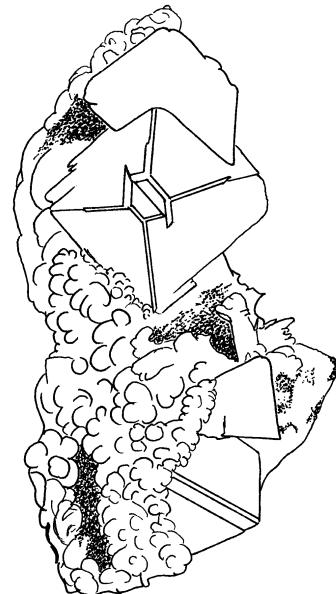
. . . FAIRY STONE

“Fairy Stone” is a popular name for a mineral called *staurolite*. Staurolite crystals often form crosses (the name *staurolite* comes from the Greek word *stauros* which means *a cross*.) Staurolite is dark brown.

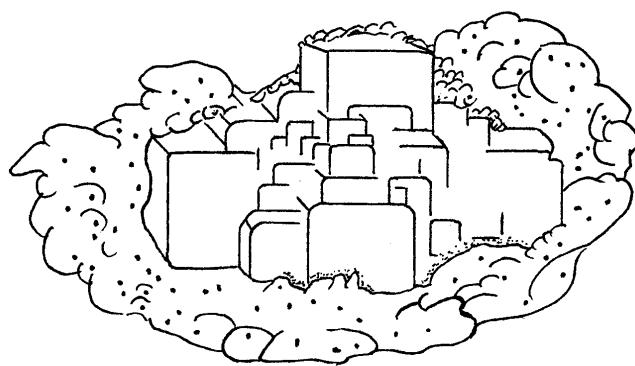


. . . FLUORITE

Fluorite is a favorite mineral with collectors for a number of reasons. Its beautiful crystals are found in many colors: yellow, blue, purple, colorless, pink, brown, and green. It also forms very nice crystals, both cubes and diamond-shaped. Fluorite contains the element called *fluorine* which is used in toothpaste to make your teeth strong.



Pink fluorite from Peru.



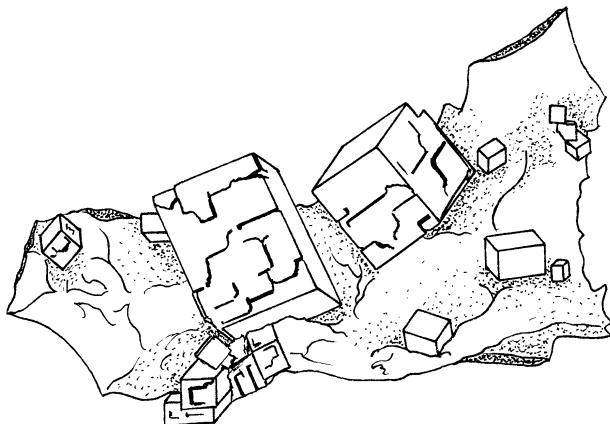
Purple fluorite from Mexico.

Apple-green fluorite on pink rhodochrosite from Colorado.

G is FOR . . .

. . . Galena

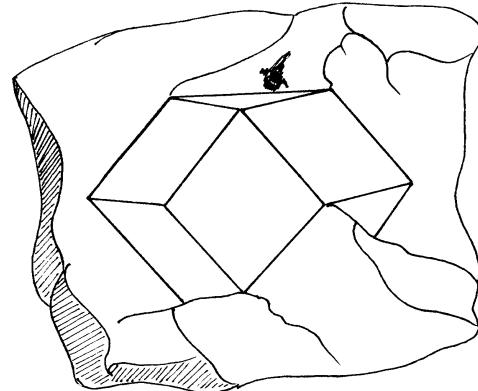
Galena is an ore of the metal lead. It is very heavy and is often very shiny. Minerals which look like shiny metal are said to have *metallic luster*. Galena breaks into perfect cubes. This is called *cubic cleavage*. Galena is gray.



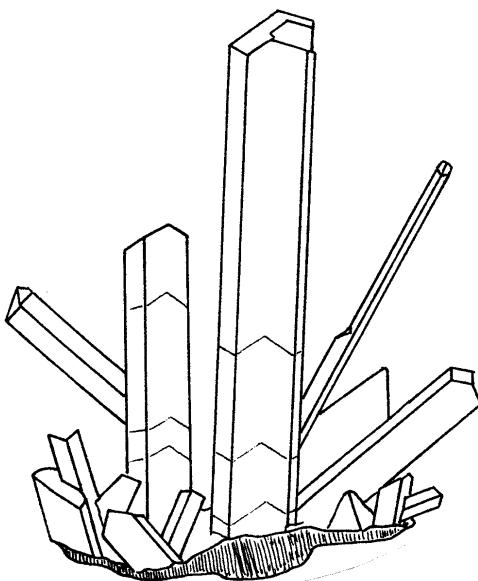
Lead-gray galena cubes sitting on dolomite rock from Galena, Kansas.

. . . GARNET

“Garnet” is the name of a *group* of similar minerals. They are different in their chemical make up. Garnets are usually found in *metamorphic rocks*. Metamorphic rocks are rocks that have been changed by heat and pressure. Garnets are used as an abrasive in sandpaper. Sometimes garnets are cut as gemstones.



Dark green garnet from Colorado. Garnets can also be red, brown, and purple.



Golden brown gypsum from Mexico.

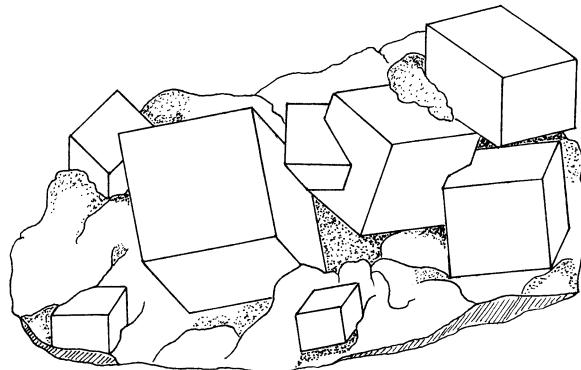
. . . GYPSUM

Only a few minerals—like talc and graphite—are softer than gypsum. Because it is so soft it is easy to crush into a powder. This powder is heated and turned into Plaster of Paris. Gypsum is also used to make wall boards for homes. When it is clear, it is given the special name *selenite*. Gypsum crystals were found in Mexico that were over 6 feet long! Gypsum can be colorless, white, brown, tan and green.

H is FOR . . .

. . . Halite

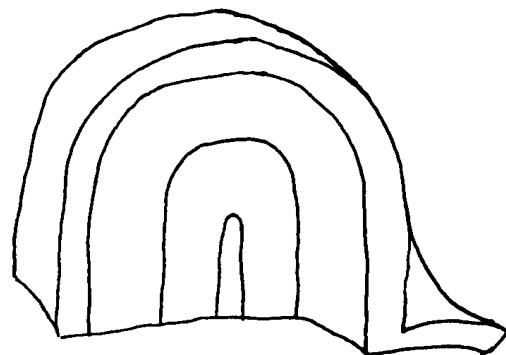
Halite is the mineral name for salt. Halite crystals are found in the shape of cubes. In the United States, large deposits of salt can be found in New York, Michigan, Ohio and Texas. Halite is colorless, but impurities can make it pink, yellow, purple, red, brown and black.



Halite crystals from Poland.

. . . Hematite

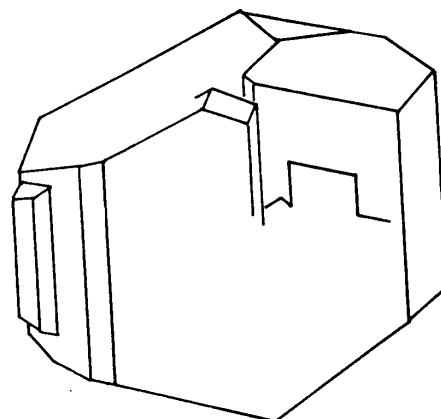
Hematite is named from a Greek word which means “blood” because all hematite is blood-red when it is crushed. Hematite is a very important ore of iron.



Layered hematite from Cumberland, England.

. . . Hornblende

Hornblende is a mineral which forms in metamorphic rocks. A metamorphic rock is one that has been changed by great heat, pressure or both. Hornblende forms interesting crystals, but it does not have any use. Hornblende is dark brown to black.

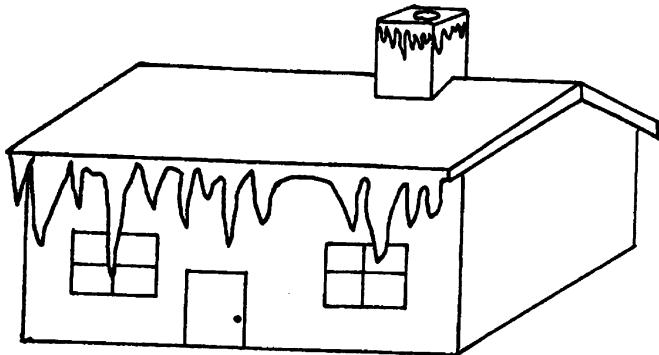
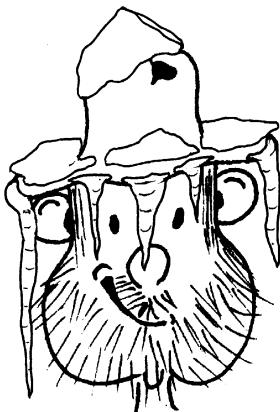
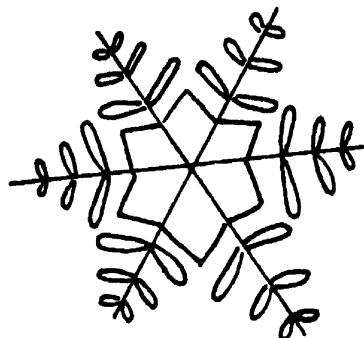


A large hornblende crystal from Canada.

I is FOR . . .

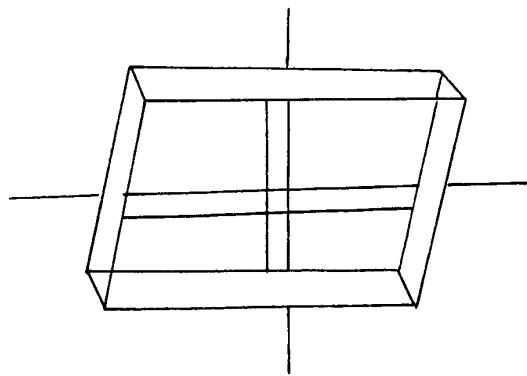
. . . Ice

Yes, ice is a mineral! But don't put it in your collection box, or everything will get wet! Ice is usually colorless or white, but the house can be any color you like.



. . . Iceland Spar

Iceland Spar is the name given to perfectly clear and colorless pieces of the mineral calcite. When you look at a line through a piece of Iceland spar, you actually see two lines. This effect is called *double refraction*.

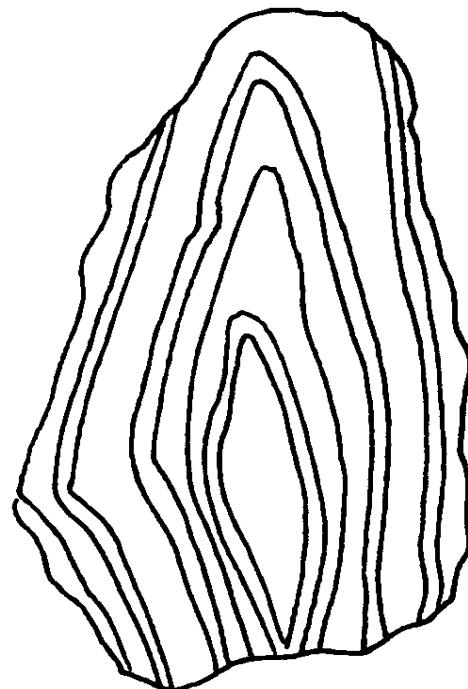


Iceland Spar from Mexico showing double refraction.

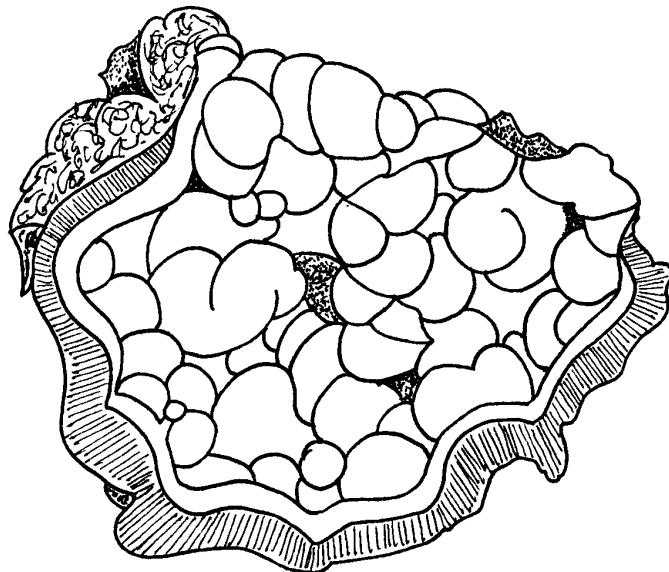
J is FOR . . .

. . . JASPER

Jasper is a variety of the mineral *quartz*. It often looks a lot like agate, but jasper is all red (and sometimes yellow.)

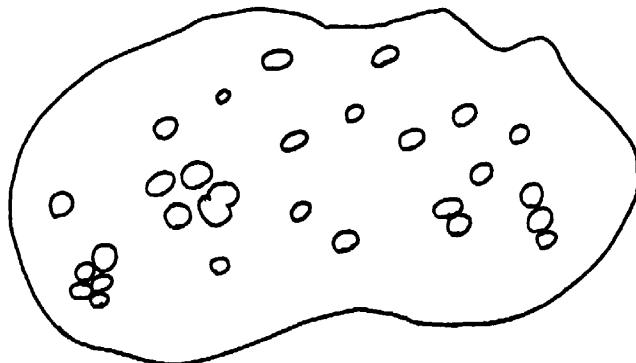


This jasper looks like agate, but each section is a different shade of red.



This is a specimen of lumpy, rounded jasper from Argentina. It is blood red.

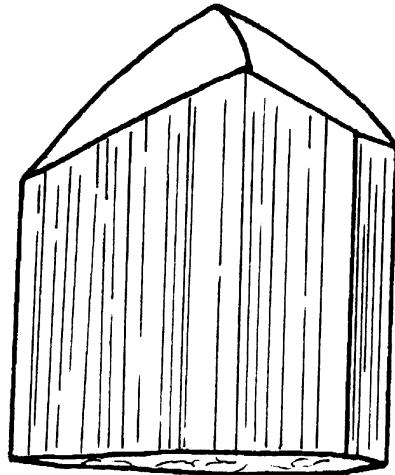
This specimen is a slice of red jasper with yellow spots. It is called orbicular jasper. You can add more spots if you wish.



K is FOR . . .

. . . Kunzite

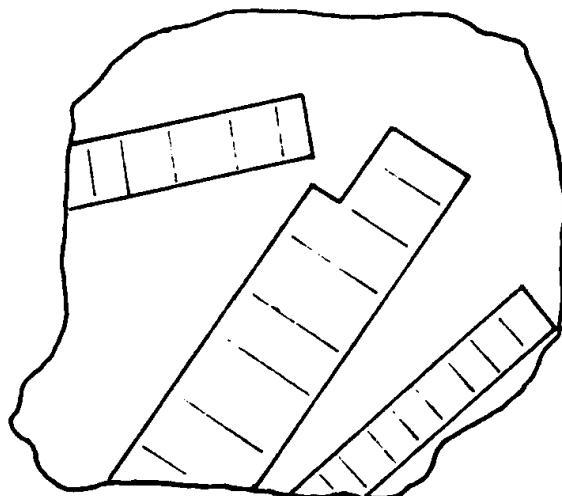
Kunzite is a gem variety of the mineral *spodumene*. It is light purple. Kunzite is cut as a gemstone. It was named after George F. Kunz, the man who identified it.



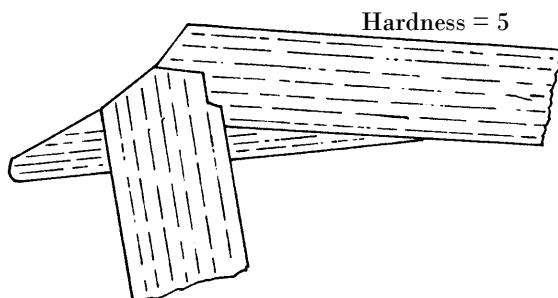
A large kunzite crystal from the Pala Mine, California.

. . . Kyanite

All minerals have a property called *hardness*. Some, like talc, are very soft and can be scratched with a fingernail. Others, like diamond, are so hard that nothing will scratch them. Kyanite is unique because it has two different hardnesses in one crystal! Kyanite is light blue or light green.



Kyanite crystals in white mica.



Hardness = 7

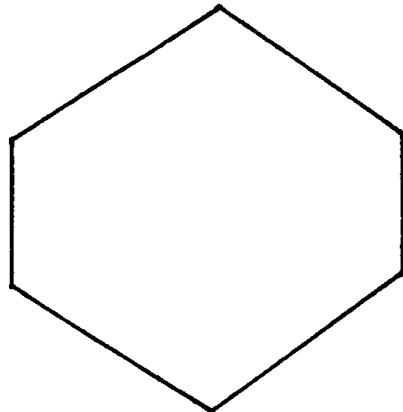
These kyanite crystals can be green or blue. Notice the different hardnesses indicated on this picture.

L is FOR . . .

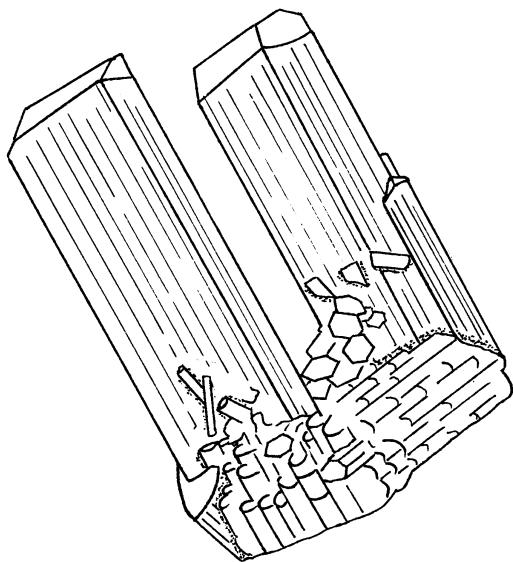
. . . Lepidolite

Lepidolite is a type of mineral called *mica*. It can be broken into very thin sheets. It is often found with spectacular minerals like tourmaline and kunzite.

Lepidolite is light purple.



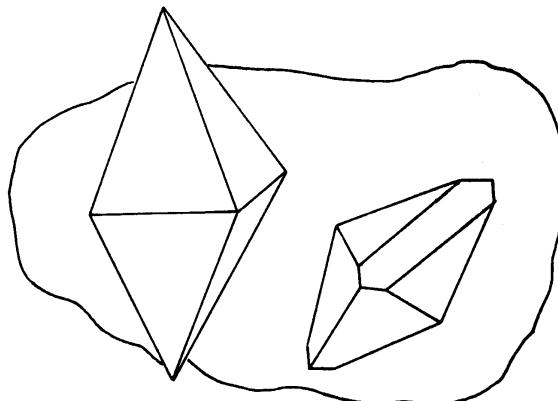
A perfect lepidolite crystal would look like this.



*Deep purple tourmaline on lepidolite crystals.
They are from Minas Gerais, Brazil.*

. . . Lazulite

Lazulite is sometimes used to decorate special buildings. Mineral collectors find its crystal shape and bright blue color very attractive.

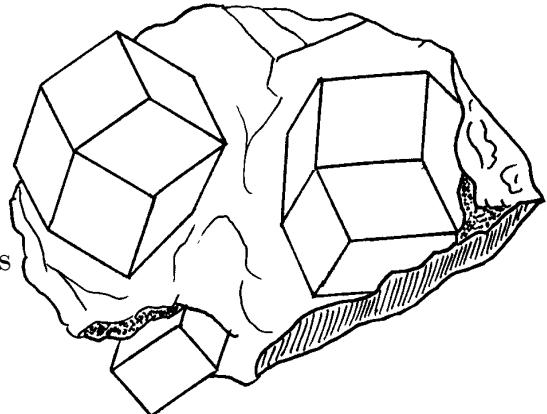


Two lazulite crystals from Graves Mountain, Georgia.

M is FOR . . .

. . . Magnetite

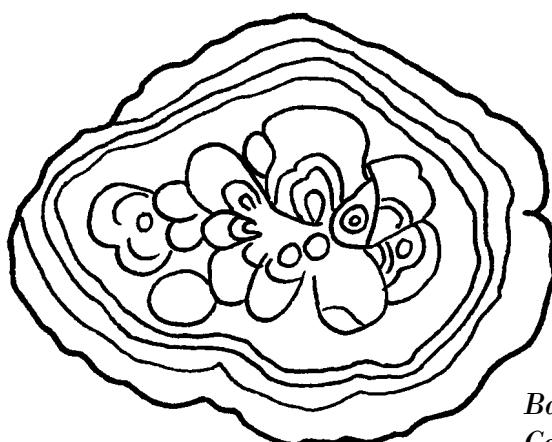
Magnetite is a natural magnet. It is the most important ore of iron in the world. Its crystals can be diamond-shaped: collectors call them *octahedral* crystals. “Octahedral” means they have eight sides or faces. The crystals in this specimen have twelve faces. They are called *dodecahedral* crystals. Color them gray.



These magnetite crystals are from Brewster, New York.

. . . Malachite

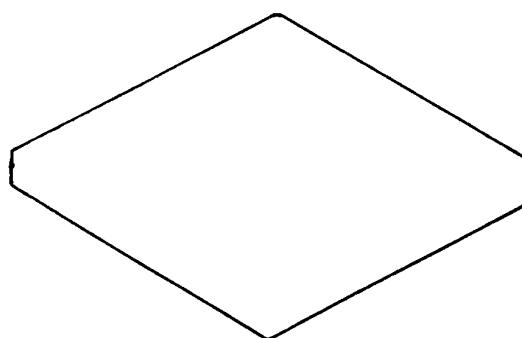
Malachite is a beautiful green mineral. It often has zones or bands, each of which is a slightly different shade of green. It polishes well, so it is used for jewelry and carvings.



Banded malachite from Bisbee, Arizona.
Color each band a different shade of green.

. . . Muscovite

Muscovite is another type of mica (see lepidolite.) Like other micas, it forms six-sided crystals and breaks into sheets. It can be yellow, light brown, green or red.



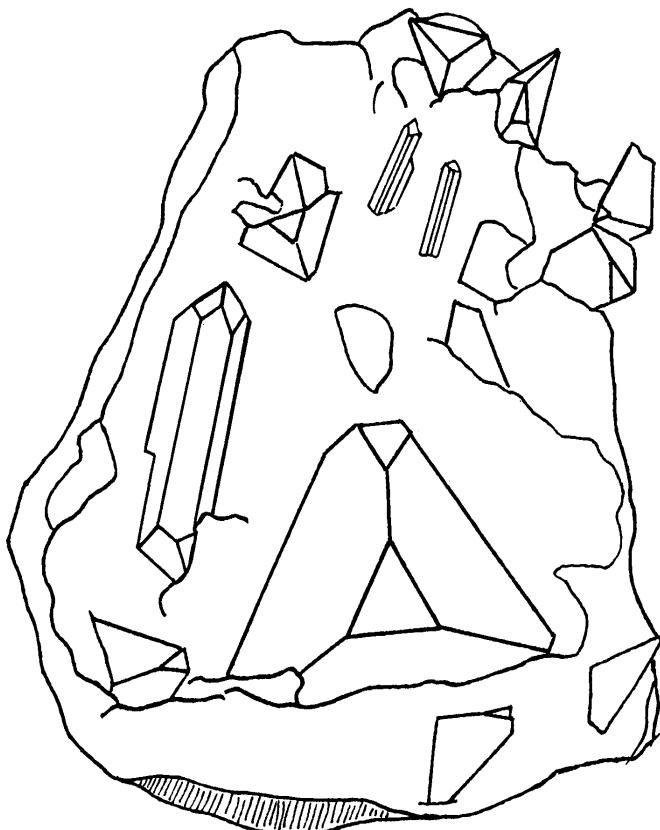
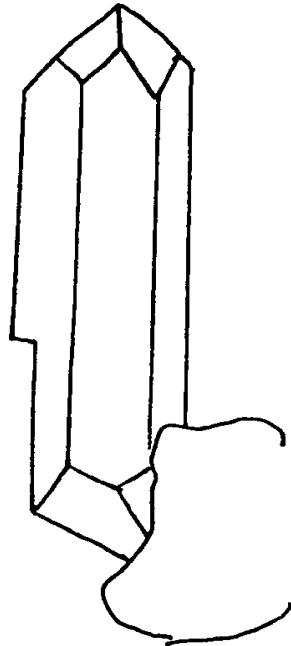
“Diamond Mica” from the Black Hills of South Dakota.

N is FOR . . .

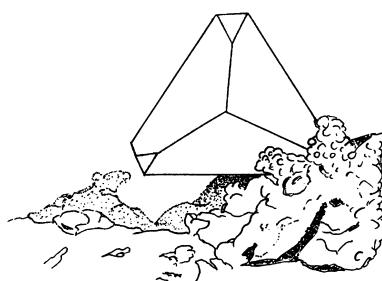
. . . Neptunite

Neptunite forms nice, dark red to black crystals which look like dark glass. At San Benito County, California, neptunite is found in a white mineral called natrolite. It is often found with the very rare, light blue mineral called *benitoite*. Benitoite crystals are shaped like triangles.

A single, large neptunite crystal.



Neptunite and benitoite crystals on natrolite. Around the edge of this specimen is a light green material called *matrix*. “Matrix” refers to any kind of material on which crystals grow. In this specimen, the matrix is a rock called “blue schist.”

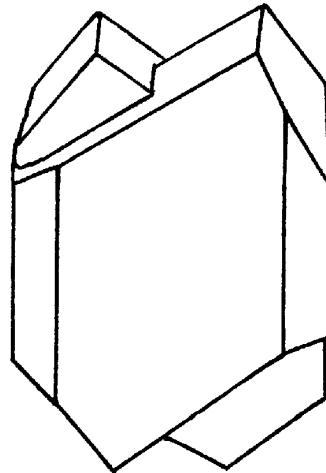


A single, light blue benitoite crystal.

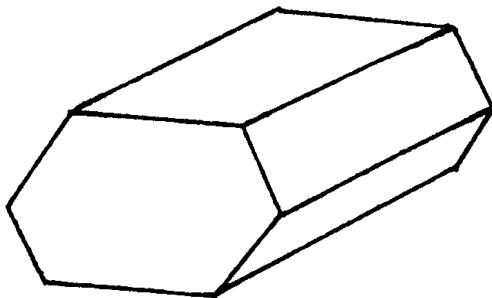
O is FOR . . .

. . . Orthoclase

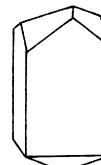
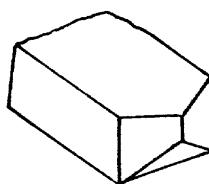
Orthoclase belongs to a group of minerals called *feldspars*. It is mixed with other minerals to make porcelain, like porcelain tea cups and saucers. Orthoclase crystals often grow together. This is called a *tinned crystal*. Orthoclase is usually white, but it can also be yellow, pink or gray.



A “tinned” orthoclase crystal from Canada.

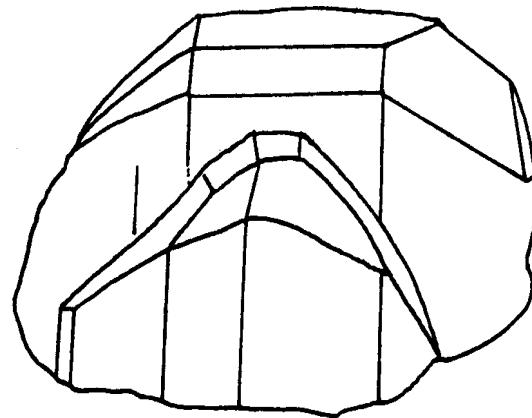


Single orthoclase crystals from Canada.



. . . Olivine

Olivine is found in igneous rocks. “Igneous” rocks are rocks that came from inside the Earth where they are so hot that they are liquid. When this liquid cools down, mineral crystals form. This olivine crystal is grass-green and is called by the special name, *peridot*.

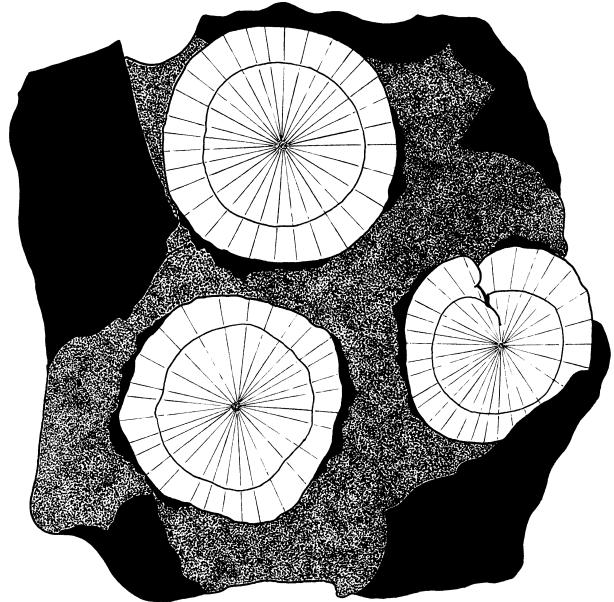


Two unusually large olivine crystals from an island off the coast of Egypt.

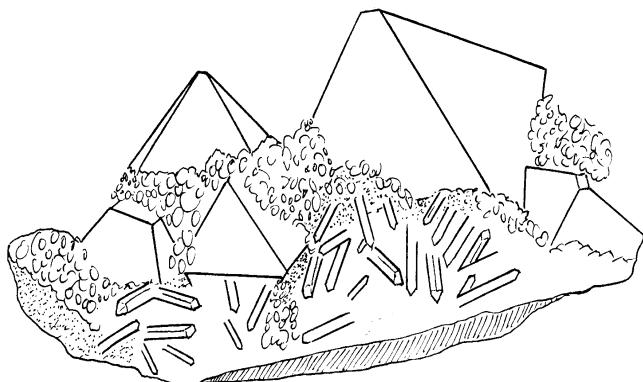
P is FOR . . .

... PYRITE

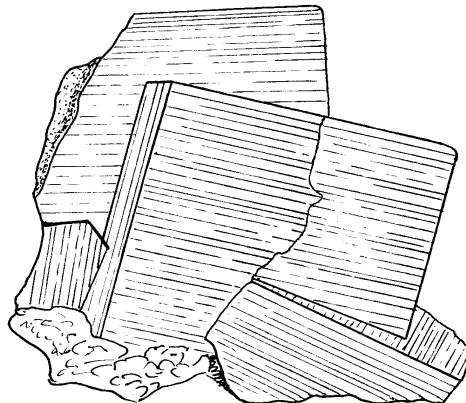
Pyrite is also known as “Fool’s Gold” because many prospectors thought they had discovered gold when they had only found . . . pyrite. Actually, gold is softer and more yellow than pyrite. Pyrite is named after the Greek word for fire because it makes a spark when it is hit with steel. Pyrite is dark yellow and has a shiny, metallic luster.



These are called “pyrite dollars” because they look like large coins. They are from Illinois.



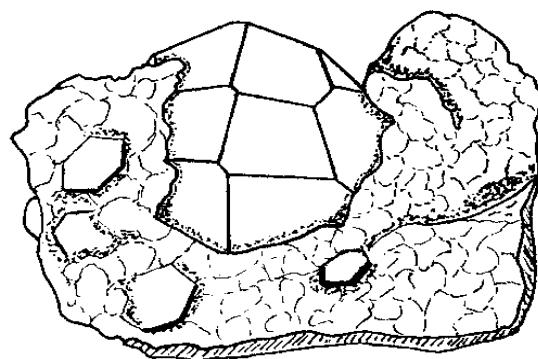
Pyrite can form diamond-shaped crystals like these from Colorado. They are sitting on clear quartz “needles.”



Shiny, intergrown pyrite cubes from Colorado.

... PYROPE

Pyrope is a dark red variety of the mineral garnet. Its crystals are often very well-formed. It is sometimes used as a gemstone.



Pyrope on gray quartz with brown mica crystals from Maine.

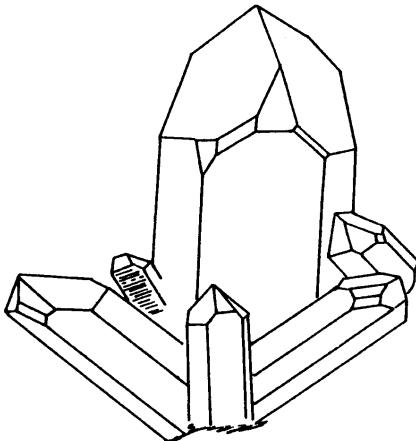
Q is FOR QUARTZ



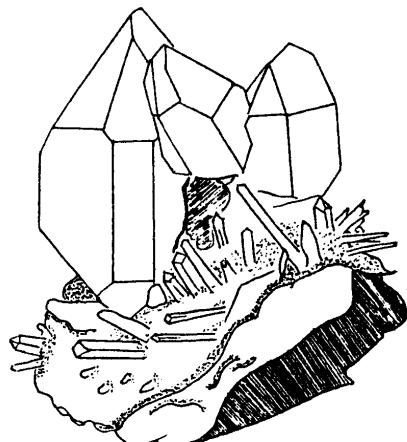
only quartz . . . and nothing but quartz

Quartz is one of the most common minerals in the Earth's crust. It is found in well-formed and often very large crystals. It comes in many colors including colorless (Rock Crystal), purple (Amethyst), brown and yellow (Citrine), black (Smoky Quartz), white (Milky Quartz), and pink (Rose Quartz).

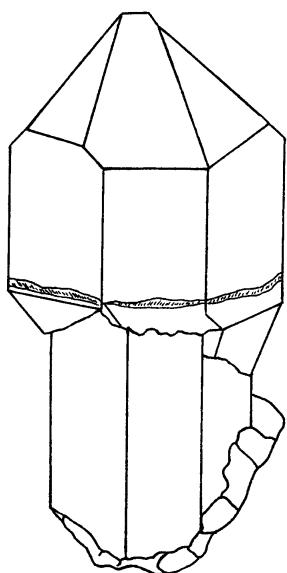
Quartz is used to make glass and jewelry. It is also used in watches and other electronic equipment.



Quartz crystals from Arkansas.

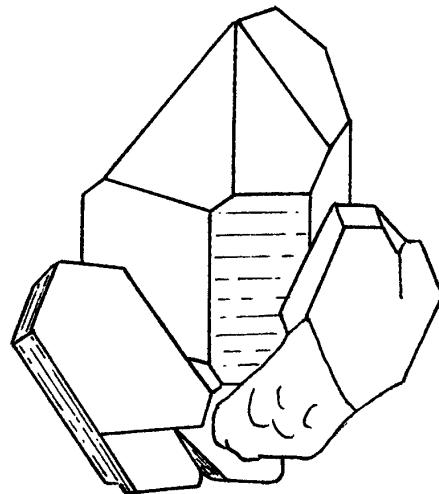


Amethyst crystals from Mexico.



Quartz scepter. A scepter crystal is one in which the top is larger than the lower part of the crystal. This one is dark brown on top and black on the bottom. It is from Nevada.

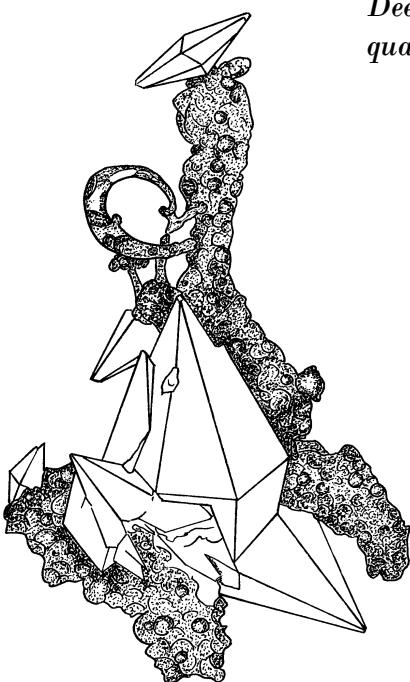
Quartz (center) with green fluorite (right) and golden muscovite (left).
From Pakistan.>



R is FOR . . .

. . . Rhodochrosite

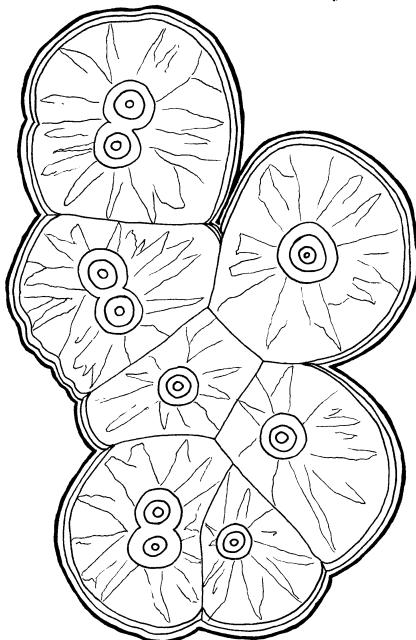
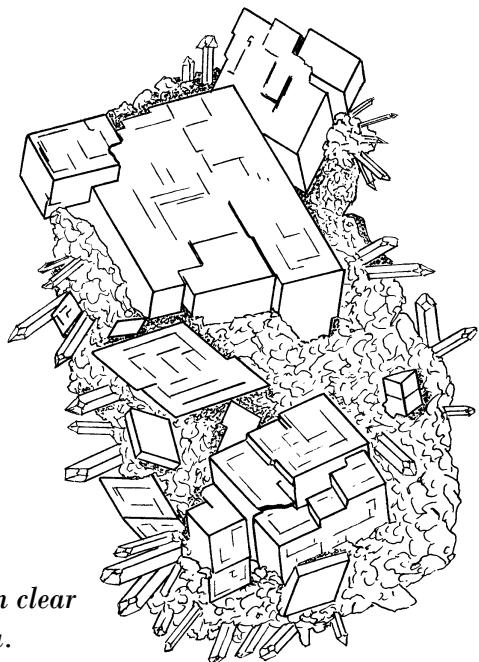
Rhodochrosite forms pink to deep red crystals. It also forms banded masses. The masses are cut, sculpted and polished. You will notice that some rhodochrosite crystals have the same "dogtooth" shape as some calcite crystals.



Dark red rhodochrosite crystals on silver.

This specimen is also from Peru.

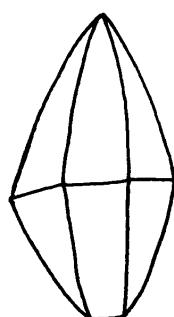
Deep red rhodochrosite on clear quartz crystals from Peru.



A slice of rhodochrosite from Argentina.
Each ring is a different shade of pink or red.

. . . Ruby

Ruby is the red gem variety of the mineral *corundum*. The only mineral harder than ruby is diamond.

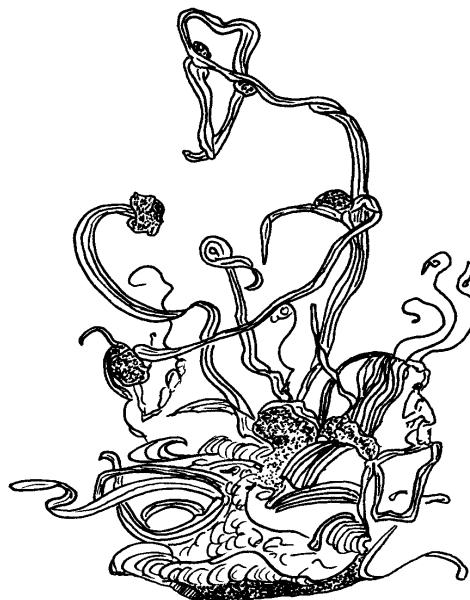


S is FOR . . .

. . . Silver

Silver is used in photography, chemistry, and jewelry. As a mineral, it is sometimes found in long wires and bundles of wires. The color of silver is described as “silver-gray” and clean silver is very bright and shiny.

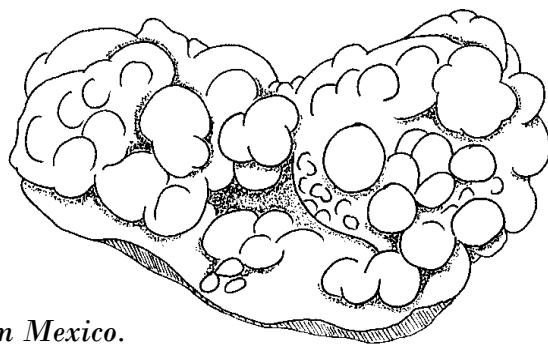
Silver wires from Peru.



. . . Smithsonite

Smithsonite rarely forms crystals. It is most commonly found in rounded “lumps” which look a little like a bunch of grapes. Mineral collectors call this form *botryoidal* which means *bunch of grapes!*

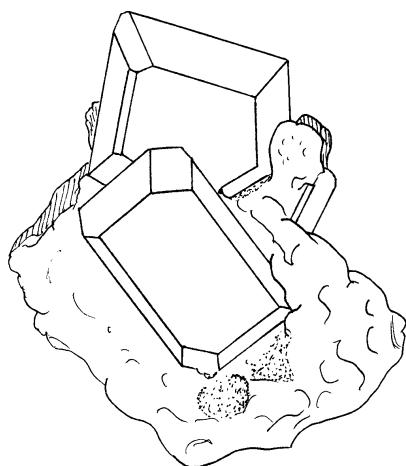
Pink smithsonite from Mexico.



. . . Sulfur

Sulfur is used in making rubber, matches and fertilizers. It will burn in a match flame, and when it does, it smells like rotten eggs. Sulfur is very soft. The United States is the world’s largest producer of sulfur. It is yellow to bright lemon yellow in color.

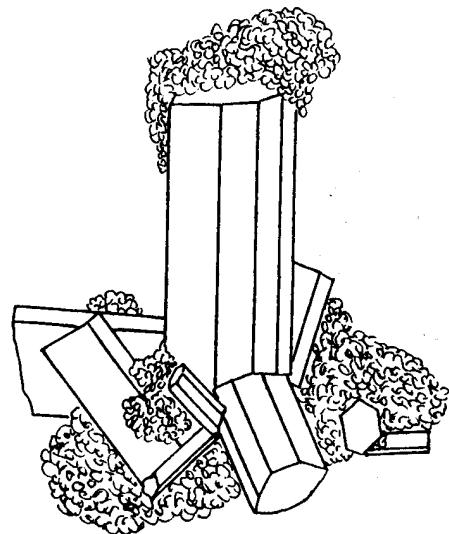
Rare sulfur crystals from Sicily, Italy.



T is FOR . . .

. . . Topaz

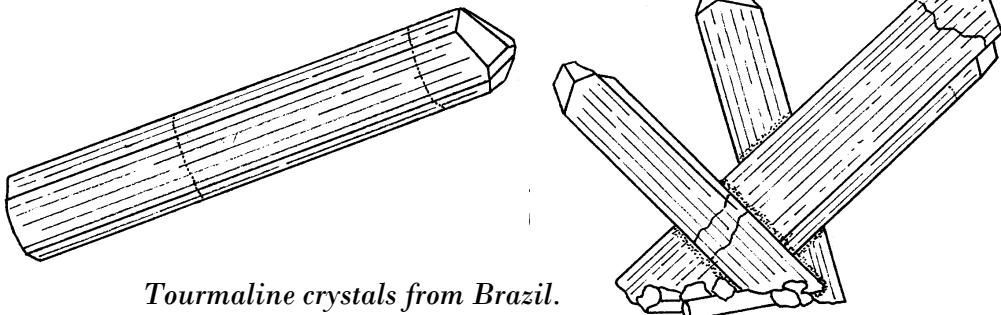
Topaz is often cut to make gemstones. Topaz can form huge crystals which can be up to 600 pounds! It is colorless, yellow, blue, green, orange, or reddish-yellow.



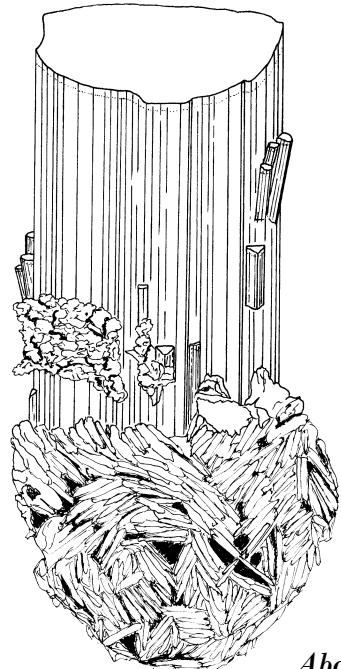
Topaz crystals from Mexico.

. . . Tourmaline

Tourmaline forms spectacular and colorful crystals. It can be black (Schorl), red or pink (Rubellite), dark brown (Dravite), or green. Some are red in the middle and green on the outside: these are called "Watermelon Tourmaline." Tourmaline is a gemstone. At one time, black tourmaline from Madagascar was used in electronic equipment.



Tourmaline crystals from Brazil.

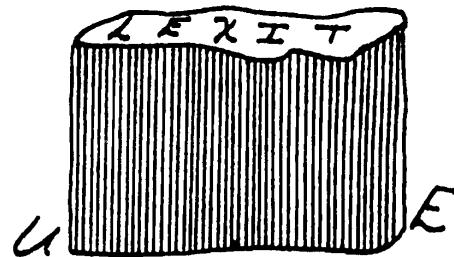
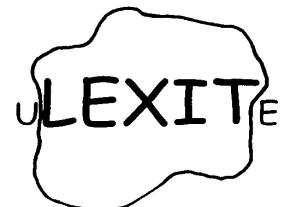
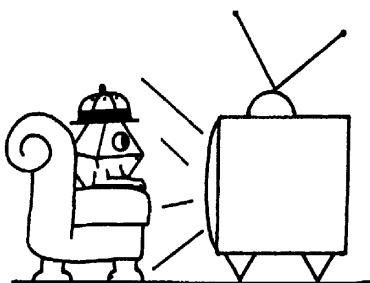


*Above:
Pink tourmaline
with a blue cap and
white albite from
Pala, California.*

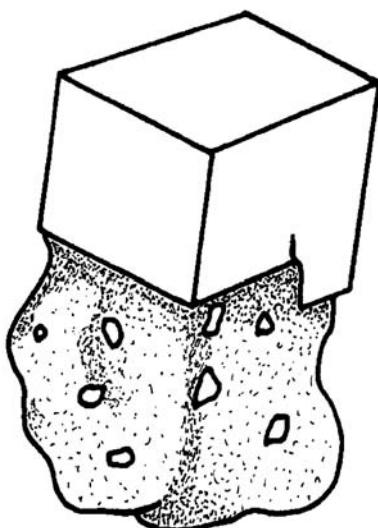
U is FOR . . .

. . . Ulexite

When a cut and polished piece of ulexite is placed over writing, the writing appears to be on the top of the specimen! This is why some people call this mineral "Television Stone." Ulexite can be white, colorless, or gray.



A ulexite specimen from California.



. . . URAninite

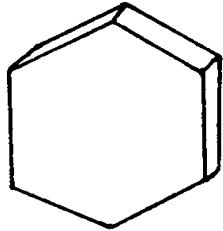
Uraninite is a mineral that contains the radioactive element *uranium*. Uranium is very important as a source of energy in nuclear reactors. It is black and shiny.

An unusually large uraninite cube from Canada.

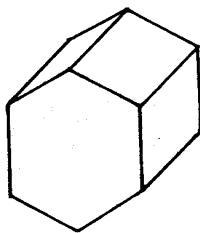
V is FOR . . .

. . . Vanadinite

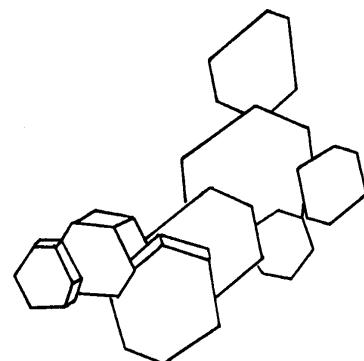
Vanadinite forms bright red to reddish-orange, six-sided crystals. Six-sided crystals are called *hexagonal* crystals. Vanadinite crystals are very valuable to mineral collectors.



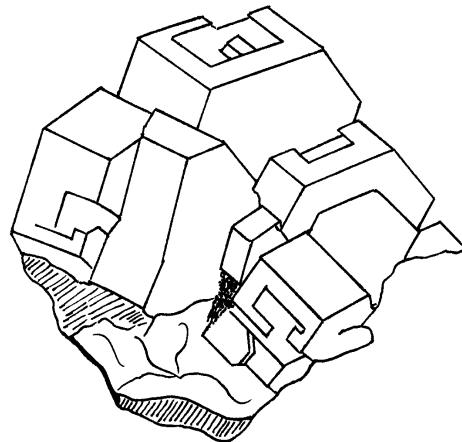
Vanadinite can form very thin crystals like this . . .



. . . or fat crystals like this.



A group of vanadinite crystals from Morocco.

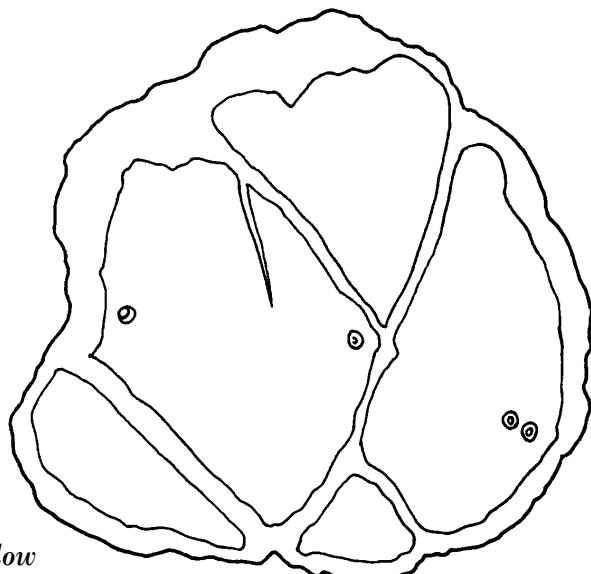


A group of orange-red vanadinite crystals.

. . . Variscite

Variscite almost always forms lumps or masses. However, some very small crystals (called *micro-crystals*) are found in Arkansas. It is light green, and can be surrounded by a yellow mineral called *crandallite*, as in this specimen.

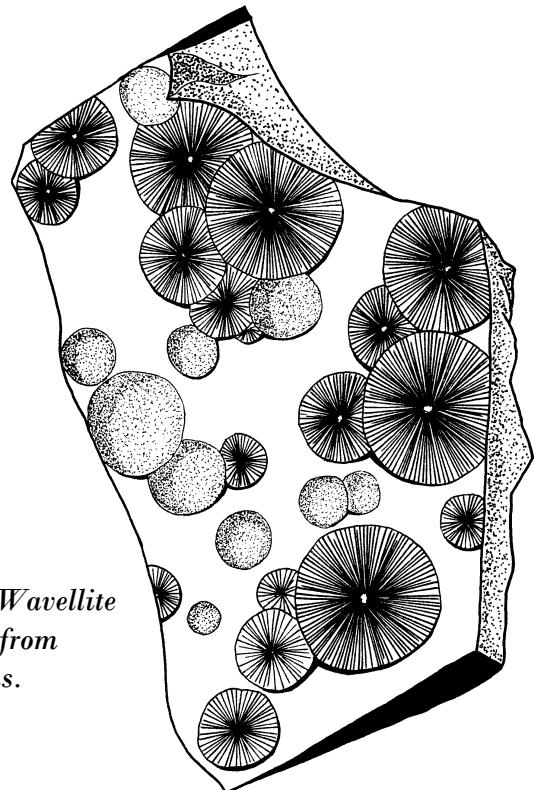
Green variscite surrounded by yellow crandallite from Utah.



W is FOR . . .

. . . Wavellite

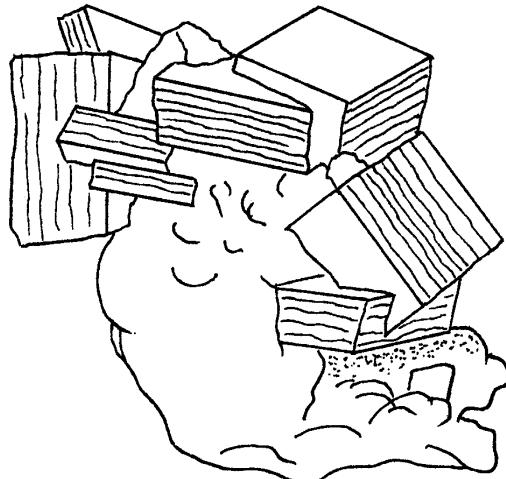
Wavellite often forms balls of crystals. When the balls are broken open, you can see how the crystals grow from the center out to the edge of the ball. This is called *radial* crystal growth. Wavellite can be white, yellow or green.



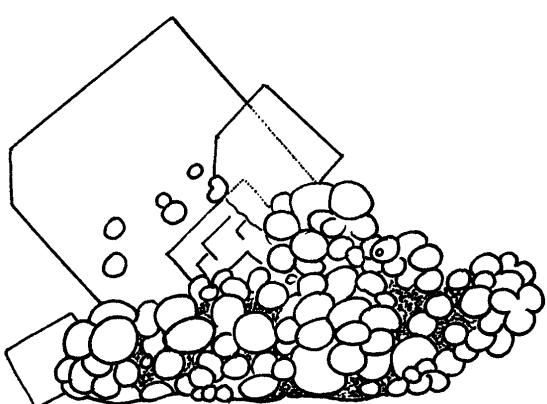
Balls of Wavellite
crystals from
Arkansas.

. . . Wulfenite

Wulfenite is a very popular, and very expensive mineral. Some crystals are thick and look like boxes. Others are so thin you can see through them. It can be found in bright, glassy red, orange, or yellow crystals.



Orange wulfenite on brown matrix from
Mexico. Notice how thick these crystals
are.

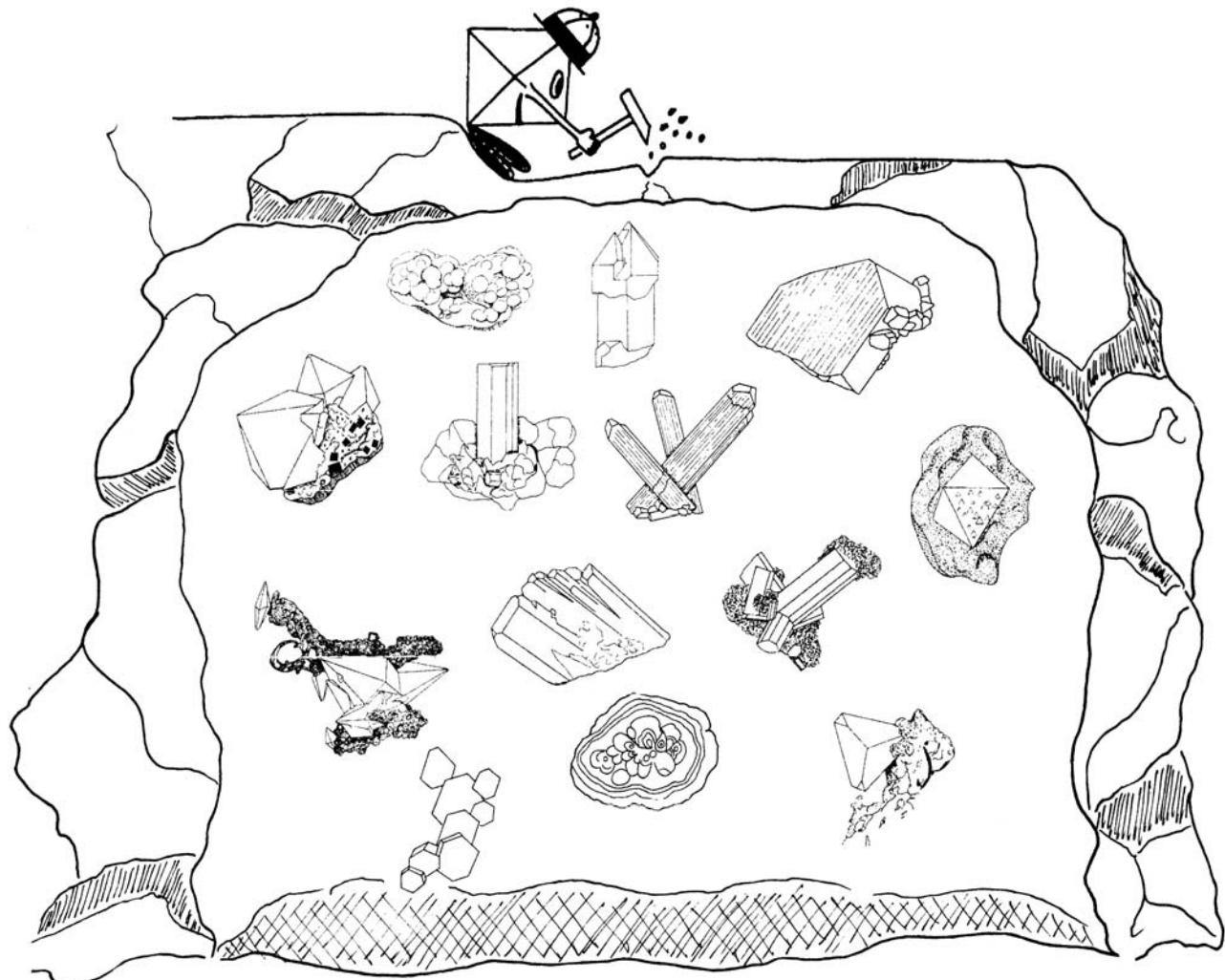


Yellow wulfenite on orange, rounded mimetite
from Mexico. These crystals are so thin that you
can actually see through them.

X IS FOR . . .

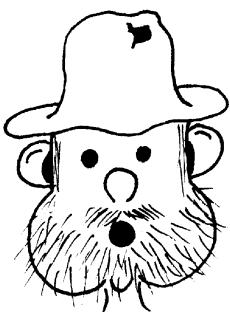
. . . KNOWING WHERE TO DIG FOR GREAT
MINERAL SPECIMENS.

AS ALWAYS . . .
X MARKS THE SPOT.



Y IS FOR . . .

Why not try drawing your own minerals?! Copy your favorite pictures from this coloring book, or draw specimens from your own collection. When you are done . . . color them.



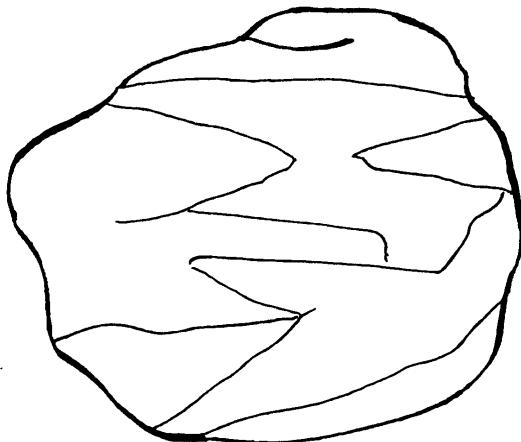
**Rocky the Miner thinks YOUR
DRAWINGS ARE GREAT!!**



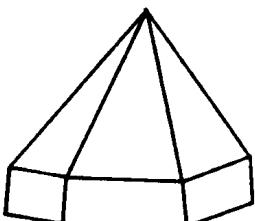
Z is FOR . . .

. . . Zincite

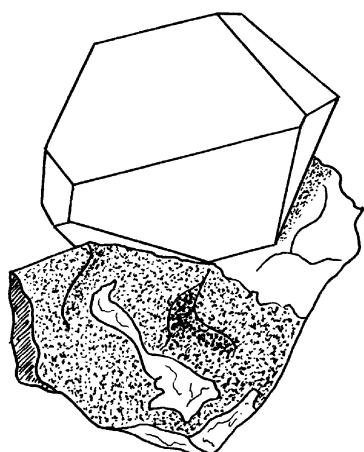
Zincite is an important ore of the element zinc. It seldom forms crystals. Franklin, New Jersey is one place where these rare crystals are found. It is orange to dark red in color.



A perfect zincite crystal.



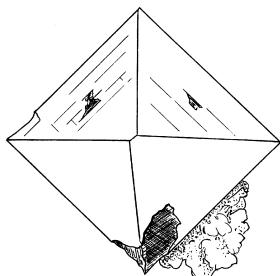
This zincite looks like fingers. It grew with white calcite.



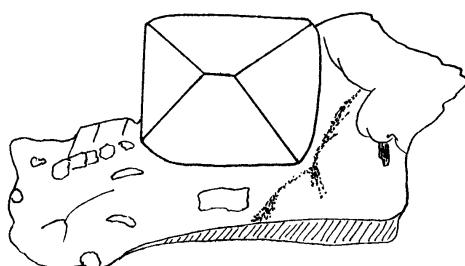
. . . Zircon

Zircon is often found in well-formed crystals. They can be more than an inch across. Brown zircon turns blue when it is heated. This blue zircon is used to make jewelry. It will turn brown again if left in the sunlight.

A black zircon crystal from Bryson, Quebec, Canada.



⇨ Dark brown zircon from Mont Saint-Hilaire, Quebec, Canada.

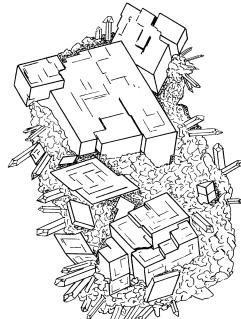


↑ A deep red zircon crystal on white matrix from Colorado.

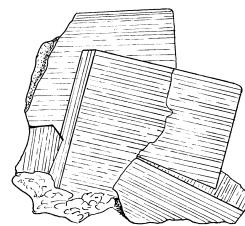
Mineral Match

Draw a line from the mineral name to the correct picture.

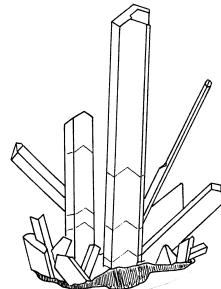
Silver



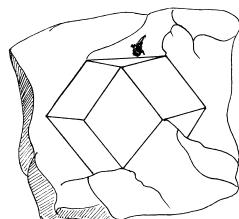
Gypsum



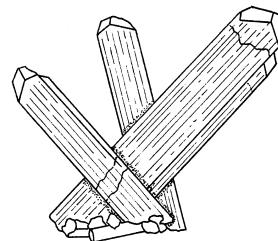
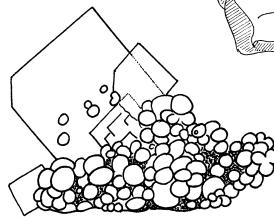
Fluorite



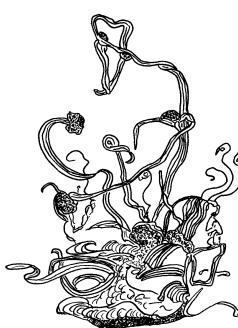
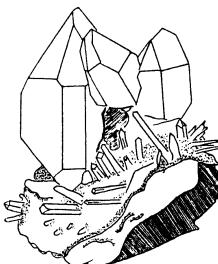
Rhodochrosite



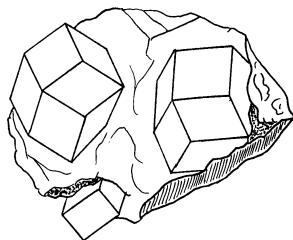
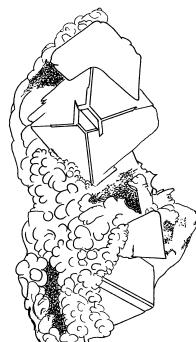
Magnetite



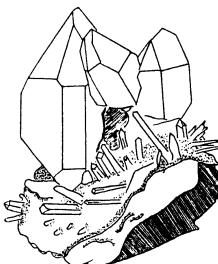
Garnet



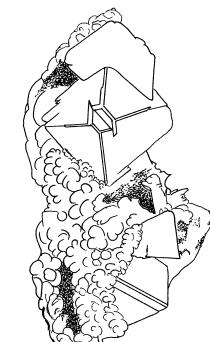
Amethyst



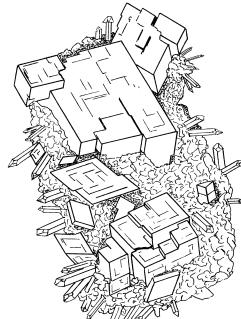
Wulfenite



Pyrite



Tourmaline

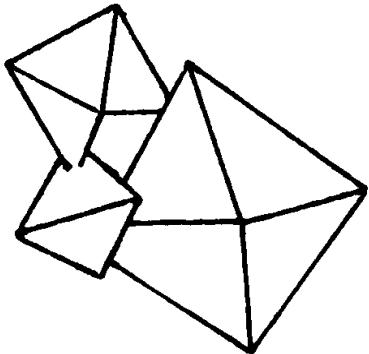




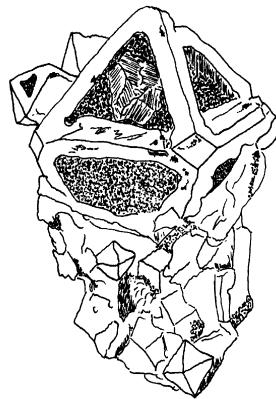
Fool's Gold

Pyrite

It might look like gold, but don't be fooled! Many prospectors ran off to the bank thinking they had struck it rich in gold only to learn they had struck pyrite. They were fooled by "fool's gold."

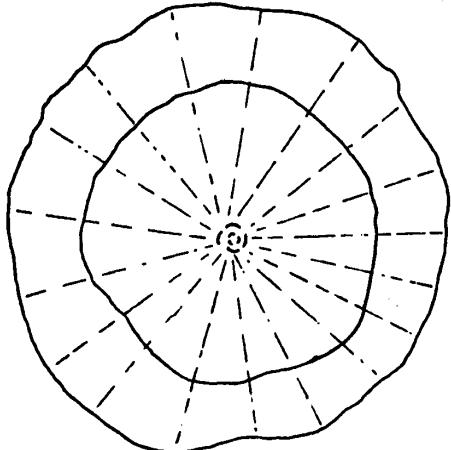


Pyrite and gold are similar in one way: they crystallize in the same *crystal system*. This means they both can form cubes and octahedra (that is, diamond-shaped crystals).



Gold from Russia

Pyrite from Peru

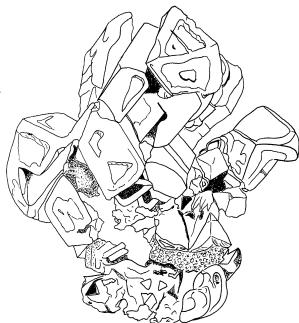


You don't have to be fooled, though, because fool's gold and real gold are *very different* from one another. Fill in the information on the following page and discover how you can tell the difference. The answers can be found in a mineral book.

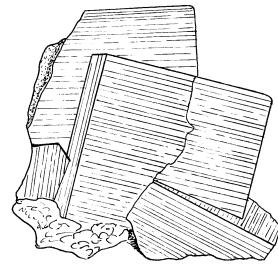
Pyrite disc (commonly called "Pyrite Sun") from Illinois.

What's the Difference?

Use a mineral book to find information about gold and pyrite and show how they are really different from each other.



Gold



Pyrite

Color: _____

Color: _____

Hardness: _____

Hardness: _____

Crystal System: _____

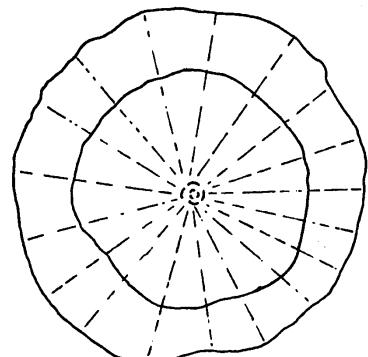
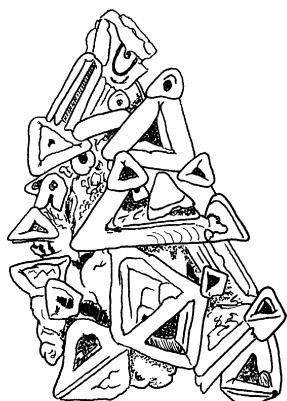
Crystal System: _____

Specific Gravity: _____

Specific Gravity: _____

Streak: _____

Streak: _____





Mineral Trivia

Some _____ crystals are so thin, you can see through them.

_____ is unique because it has two different hardnesses in one crystal.

_____ has the element *strontium* in it, which is used to make bright red fireworks.

The name of this mineral means *heavy*. The mineral is _____.

_____ is very valuable. It is also *ductile* which means it can be stretched into long, thin wires.

_____ is also known as “Fool’s Gold.”

_____ is an important source of uranium for nuclear reactors.

_____ is used to make porcelain.

_____ is the mineral name for nature’s magnet.

_____ can form huge crystals, some as big as 600 pounds.

_____ is an ore of the metal called *lead*.

_____ is the hardest substance on Earth.

_____ is the green variety of the mineral *beryl*.

_____ is named from a Greek word which means *blood*.

_____ is the mineral name for *salt*.

_____ is used in photography and jewelry.

_____ usually grows in rounded masses that look like a bunch of grapes.

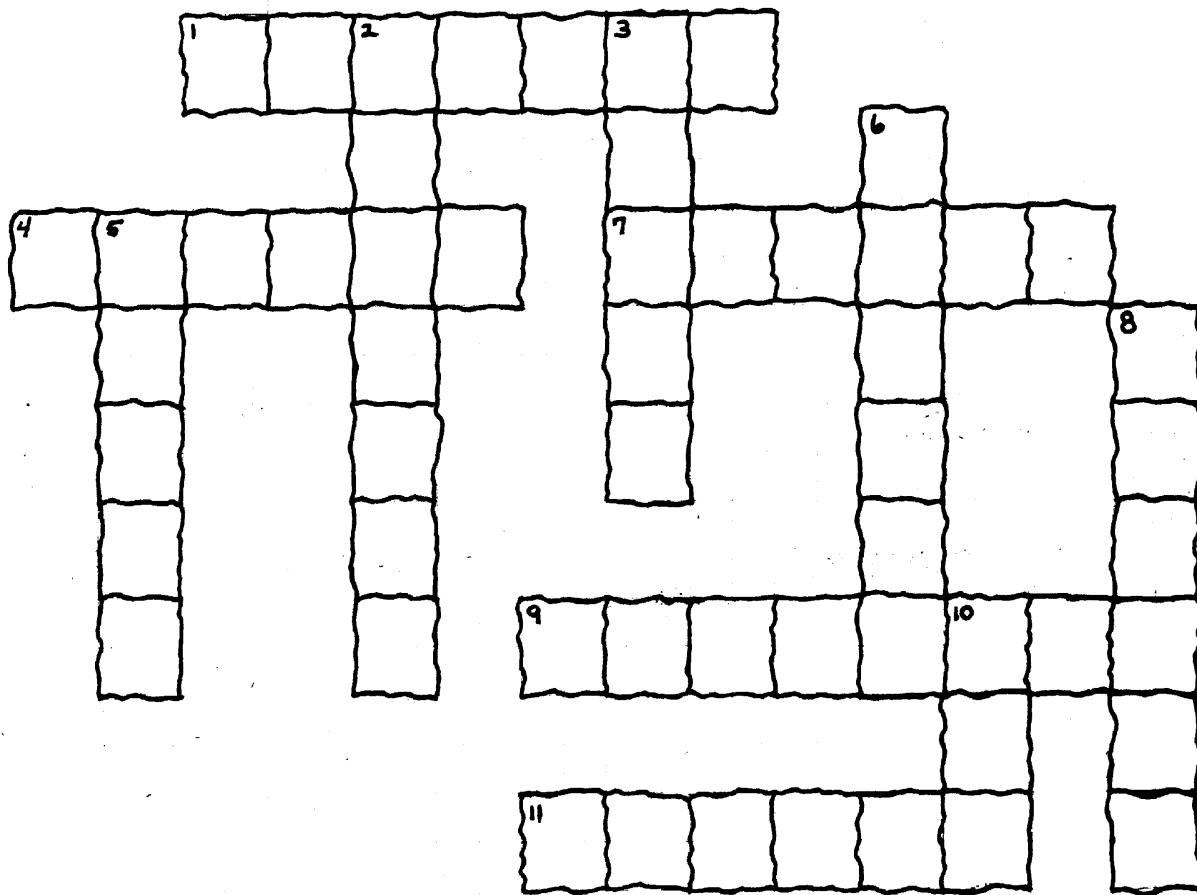
_____ is the mineral name for “Television Stone.”

Choose From The Following Minerals . . .

Barite, Celestite, Diamond, Emerald, Galena, Gold, Halite, Hematite, Kyanite, Magnetite, Orthoclase, Pyrite, Silver, Smithsonite, Topaz, Ulexite, Uraninite, Wulfenite.



Mineral CROSSWORD PUZZLE



Across

1. A blue mineral named after a word which means *blue*.
4. A red variety of the mineral *quartz*. It can sometimes be yellow, too.
7. Also known as "Fool's Gold."
9. This mineral contains the element *fluorine*. It comes in many colors.
11. The mineral name for *salt*.

Down

2. Also called "Television Stone."
3. This mineral can form crystals weighing hundreds of pounds.
5. A variety of *quartz* with many colors and patterns.
6. This mineral is used in photography and chemistry. It can form long wires.
8. A very heavy mineral with metallic luster. It is an ore of lead.
10. This mineral melts above 32 degrees Fahrenheit.

We Use a LOT of Minerals!

In a lifetime, the average American will use a LOT of stuff.

Much of this “stuff” comes from minerals.

In his lifetime, Corundum Carl will use . . .

1,600 pounds of Copper
(from azurite, malachite, cuprite)

32,300 pounds of salt
(halite)

920 pounds of zinc
(from sphalerite)

42,000 pounds of iron ore
(hematite and magnetite)

68,000 pounds of cement
(cement is made from lime-stone, sand and gravel.
Limestone contains the same material as calcite—
calcium carbonate)

1.7 Troy ounces of gold

5,700 pounds of aluminum
(from bauxite)

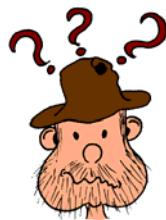
1,000 pounds of lead
(from galena)

20,500 pounds of phosphate rock

61,000 pounds of other minerals
(like gypsum, spodumene, sulfur, silver,
quartz, and fluorite)

You will use this much, too!!

Letter Scramble



Unscramble the letters of these mineral names. They are all found in this book.

oretiufl

evlsri _____

rpjsae _____

ytierp _____

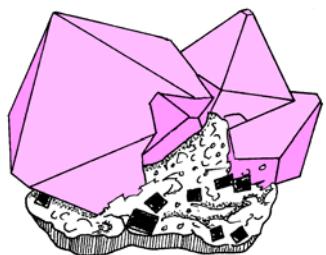


dlog _____

rmealde _____

zuqatr _____

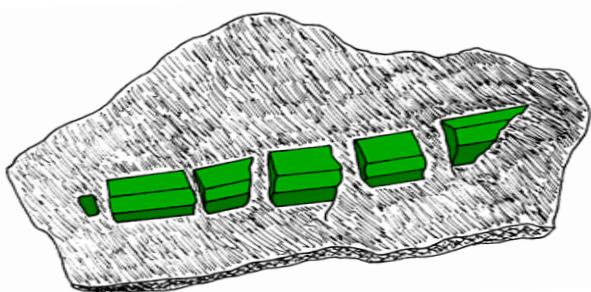
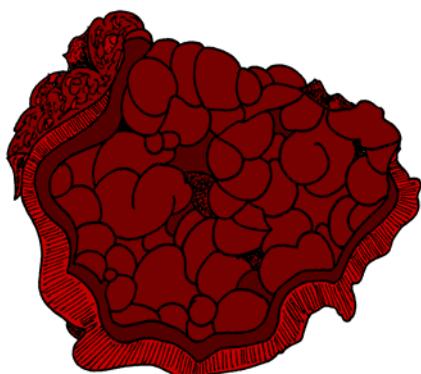
cclatei



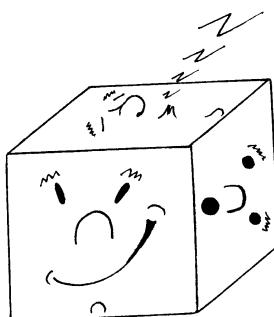
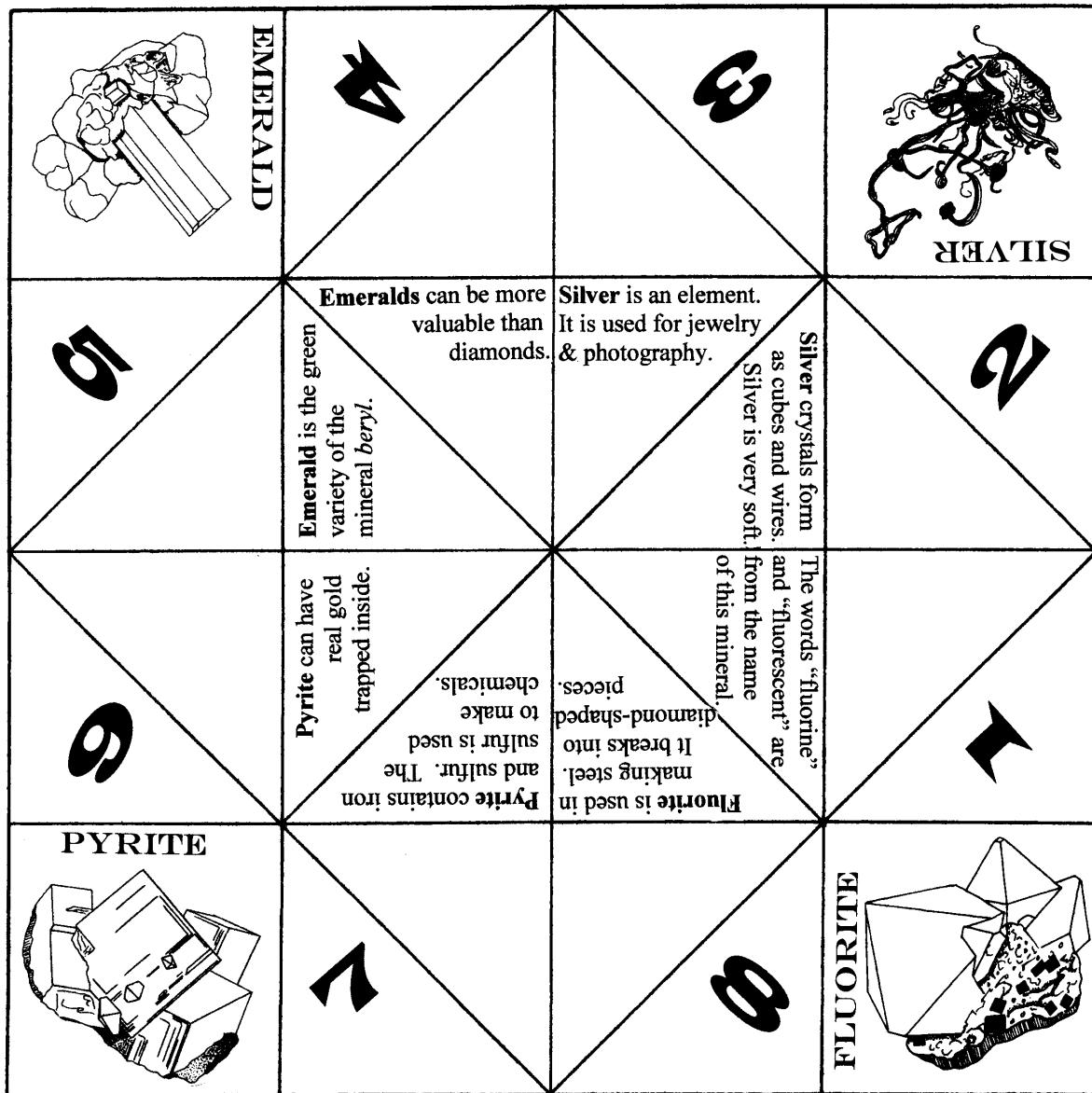
amsytteh _____

gmypus _____

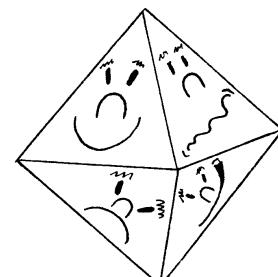
Imagea _____



Mineral Cootie Catcher



CRYSTAL FACES



Cootie Catcher Directions

1. Cut out the cootie catcher on the previous page.
2. Fold it in half from the silver corner to the pyrite corner. You will be folding the pictures of the minerals in half. Every time you make a fold, press hard to make a sharp fold in the paper.
3. Open the paper and fold it in half from the fluorite corner to the emerald corner. Again, you will be folding the pictures of the minerals in half.
Unfold so you are back to the square.
4. Next, flip it over so the blank side is facing up and fold the mineral picture corners into the center of the creases in the paper. You will now have a smaller square with the four mineral pictures facing you.
5. Flip it over again so that the facts about the minerals are facing up. Fold all four corner points to the center again.

6. Put your two thumbs and two fingers into each of the four flap pockets. The flap pockets are the spaces under the mineral pictures. Use your fingers to press the center creases so that all four flaps meet at a point in the center.

How To play

Have a player choose one of the top four mineral squares. Spell the mineral they chose while you open and close the Cootie Catcher once for each letter in the mineral they selected. The player then selects one of the four numbers on the inside. Open up and down and side to side as you count the number they picked. When you've stopped counting, look inside and let the player choose again. Open and close the right number of times, then choose once more. Open the panel under the number and read the mineral fact under the panel. Play over and over, again and again.

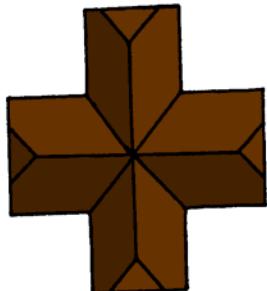
MINERAL NAMES

Where do they come from? What do they mean?

When a baby is given a name, the name usually has a special meaning. Ask your parents why they chose your name. Our cats and dogs have names that say something special about their looks or personalities. A dog named "Fluffy" usually has fluffy fur. Can you guess why a dog would be named "Fang"?

Mineral names also tell you a story. If you look closely at mineral names, you can discover all sorts of interesting information. Mineral names sometimes tell their chemical formula. They introduce us to famous and not-so-famous collectors. They can also introduce us to scientists and poets. Some are named after cities and some after regions. When you study mineral names, you will know more about geography, history, and languages.

Before we start looking at different kinds of mineral names, I want to show you how mineral names end.



Some mineral names end with **-lite**

like staurolite, lazulite and mesolite.

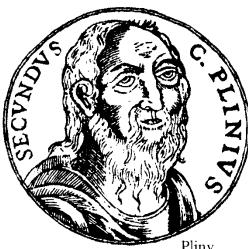
"-lite" comes from the Greek word "lithos" which means "a stone." So, staurolite is a stone in the shape of a cross and lazulite is a blue stone.

Left: A dark brown staurolite crystal from North Carolina, USA.

Many more minerals end with **-ite**

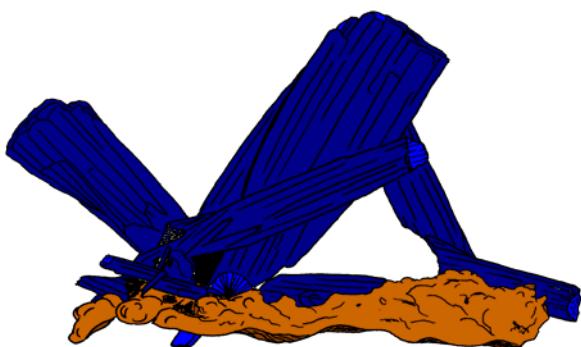
like fluorite, malachite, azurite, magnetite, and pyrite.

The -ite ending is NOT a short version of -lite!!!! It is an ending that was used by ancient Greek and Roman writers . For example, a man named Pliny the Elder (here's his picture) called the mineral malachite by the name "molochites." Do you see the -ite in there?



Modern mineralogists continue to use this ancient ending, even today!

Right: A polished slab of banded malachite from Africa. The bands alternate between dark green and light green.



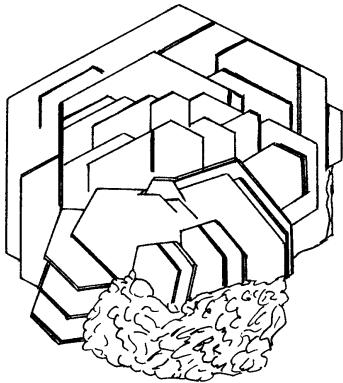
Left: Dark blue azurite crystals on brown rock.



Using the internet or a good mineral book, list the meanings of the names of 25 different minerals.

MINERAL NAMES, CONTINUED

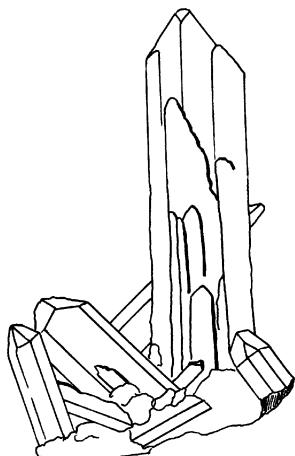
Some minerals were named after a **special place**, usually a place where they were first found or where there is a large deposit of the mineral.



Muscovite was named after a region in the old country of Russia. The region was called *Muscovy*. Muscovite can be broken into very thin sheets that are clear. You can see right through them! Pieces of muscovite were cut up to make windows for stoves. Because of this, some people called muscovite "Muscovy Glass."

Left: Golden brown muscovite crystals from Brazil.

Tanzanite was named after the African nation of Tanzania, where it was discovered in July of 1967. Tanzanite is a deep blue, gem variety of the mineral zoisite. To the right is a tanzanite crystal.

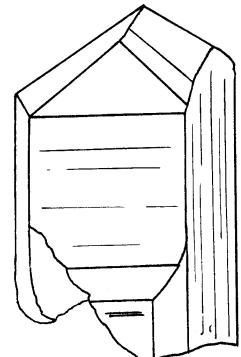


Vesuvianite was named after Mount Vesuvius in Italy. The first crystals of this mineral that were studied by scientists came from Mount Vesuvius.

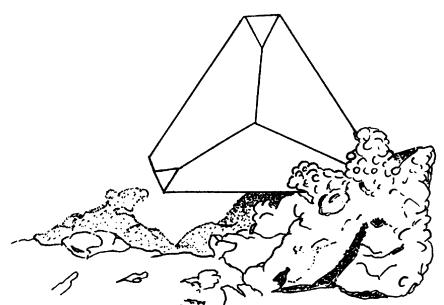
Left: Vesuvianite crystal group from the Jeffrey min, Asbestos, Quebec, Canada. The vesuvianites from the Jeffrey mine are light green, purple, or yellow.

Benitoite was named after San Benito County, California, USA where it was discovered.

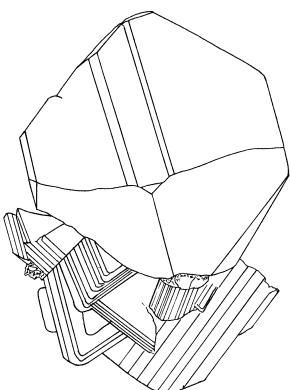
Right: A light blue benitoite crystal.



Brazilianite was discovered where???? You can do this!



Left: A large, light yellow brazilianite crystal sitting on light tan muscovite crystals.



Minerals are also named after cities, people, mountains, their chemical formulas, their physical properties, their color, and more.

Find The Minerals with a Metallic Luster

All minerals have a property called *luster*. “Luster” is the appearance of the mineral in light. *Metallic luster* refers to minerals which look like a very shiny metal.

Antimony	M	A	R	C	A	S	I	T	E	S
Bornite	A	B	D	Y	F	I	X	D	A	B
Copper	G	E	L	P	M	L	N	G	B	O
Galena	N	T	O	L	O	V	T	V	H	R
Gold	N	T	O	L	O	V	T	V	H	R
Hematite	E	I	G	A	L	E	N	A	E	N
Iron	T	N	E	T	I	R	Y	P	M	I
Magnetite	I	B	A	I	N	L	P	R	A	T
Marcasite	T	I	U	N	R	O	E	D	T	E
Platinum	E	T	Q	U	C	O	H	S	I	G
Pyrite	P	S	F	M	I	K	N	T	T	S
Silver	Y	N	O	M	I	T	N	A	E	W
Stibnite										

Diamond Dan loves colorful minerals.

Help him Find These Favorites.

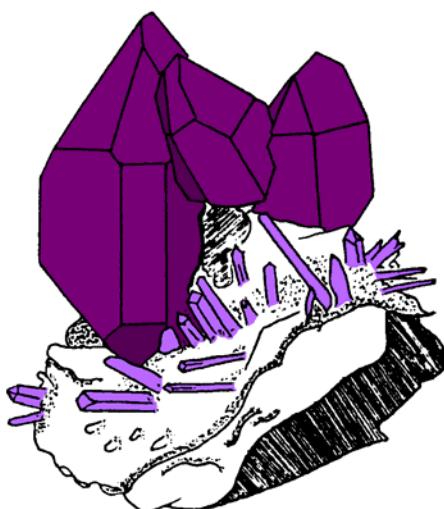
Agate	D	T	U	R	Q	U	O	I	S	E
Amethyst	T	I	Y	B	U	R	P	L	N	T
Azurite	O	E	O	F	S	M	A	S	E	D
Beryl	U	T	C	P	W	U	L	N	T	F
Calcite	R	I	E	J	T	Q	L	O	I	L
Crocoite	M	O	T	A	R	A	E	F	R	U
Dioptase	A	C	I	D	V	T	S	B	U	O
Fluorite	L	O	C	E	A	Y	B	E	Z	R
Gold	I	R	L	G	O	L	D	R	A	I
Jade	N	C	A	M	E	T	H	Y	S	T
Lapis	E	H	C	S	I	P	A	L	J	E

We use minerals every day of our lives. We depend on copper pipes to bring clean, fresh water to our sinks. We look through glass windows made of quartz sand. We turn on a light bulb, and the tungsten filament glows and lights our room. The rubber tires on our bicycles and cars are made with the help of sulfur. Homes and office buildings are built with steel. Our plaster walls are made of gypsum. Minerals are the source of many products and materials.



Rhodochrosite on silver

We rely on the *physical properties* and *chemical compositions* of minerals to provide these useful products. This book will introduce you to the variety of minerals in the mineral kingdom, to their physical properties and to their uses.



Amethyst crystals