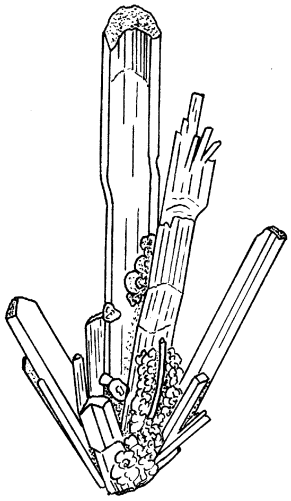
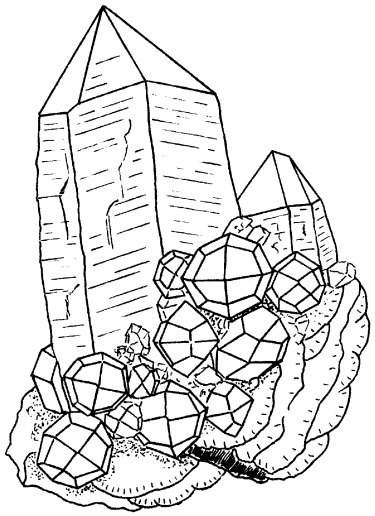
DIAMOND DAN PUBLICATIONS
PRESENTS . . .

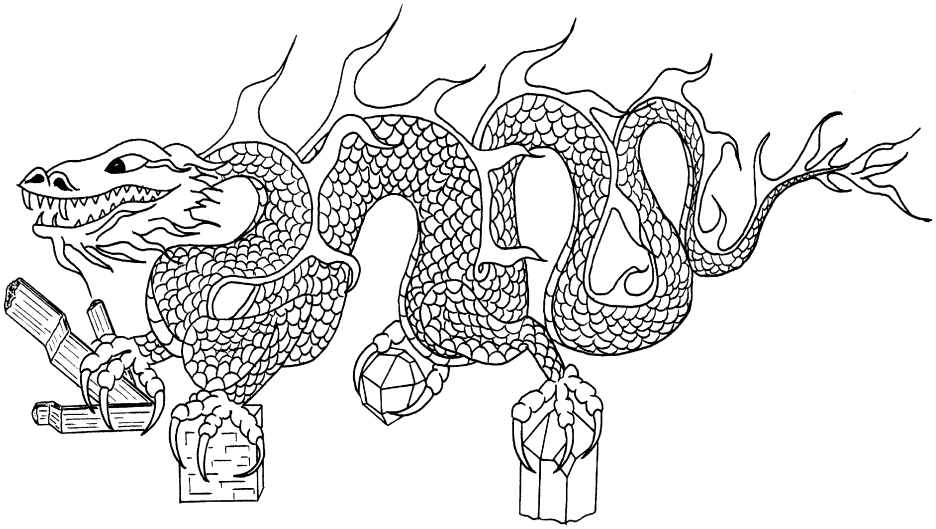
MINERALS FROM CHINA

WELCOME to a brief review of some of the many useful and beautiful minerals from China.



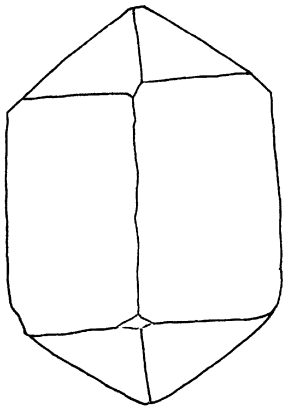
In recent years, many beautiful mineral specimens have come from China. In fact, China is quickly becoming a leading producer of mineral resources in the world. Copper, antimony, gold, iron, tungsten and zinc are just a start of the long list of mineral resources found in China. Using books and the internet, make a list of the mineral resources from China. What are they? How much is mined each year? What are the estimates of minerals to be found in China?

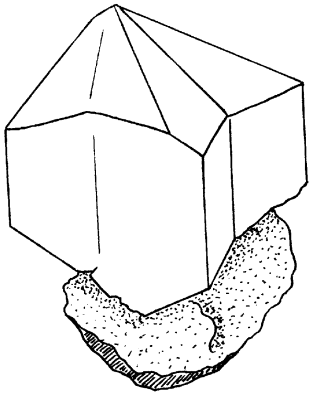




Cassiterite

Xue Bao Diang Mountains, Sichuan Province

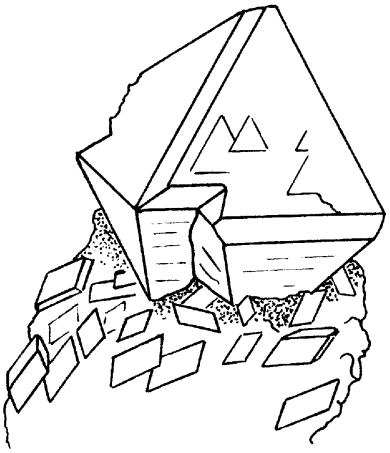




Uses: Cassiterite is a very important ore of the element tin.
Name: Cassiterite is named from the Greek word *kassiteros* which means *tin*. It is sometimes called *Tin Stone*.
Color: Cassiterite is dark brown to black.

Cinnabar

Fenghuang, Hunan Province



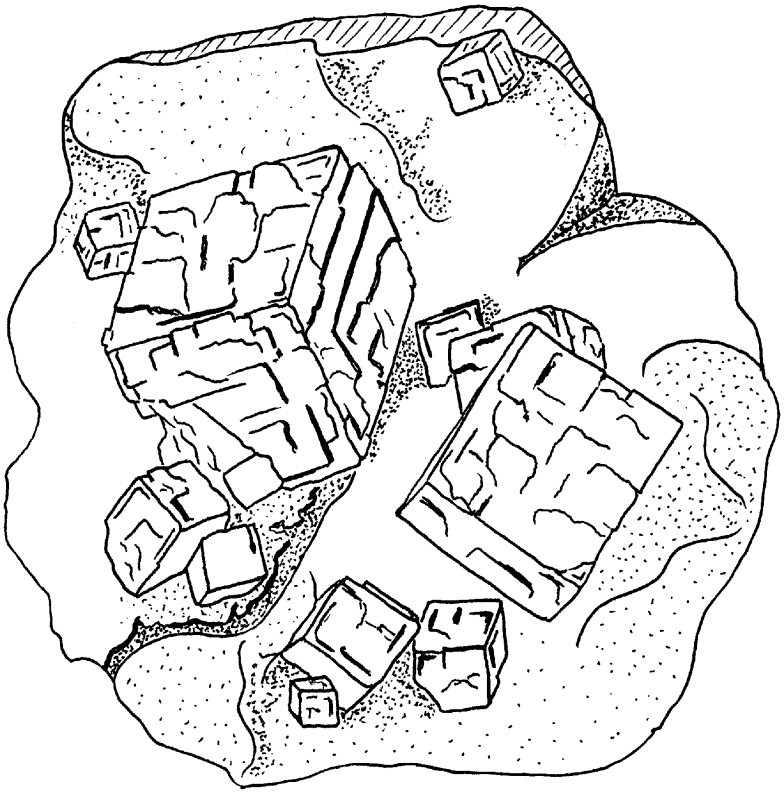
Uses: Cinnabar is an ore of the element *mercury*. Mercury is the only metal that is a liquid at room temperature. Mercury is used in scientific equipment and thermometers.

Name: It is believed the name *cinnabar* came from the Greek word *kinnabaris* which is the ancient name for this mineral. Mercury is also called *quicksilver* because of its bright, silvery color and the fact that it runs like a liquid.

Color: Deep red to bright red.

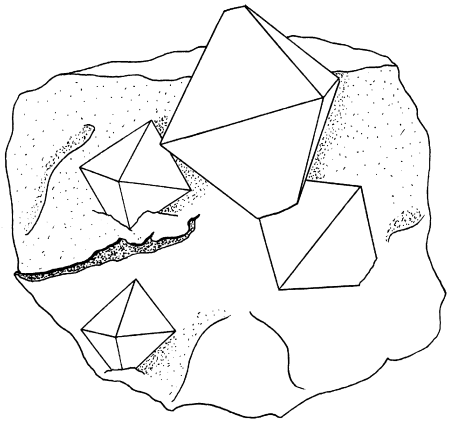
Fluorite

Yiwu, Zhejiang Province



⇦Deep purple fluorite on white quartz.

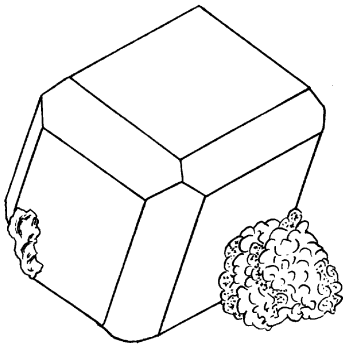
Below: Green fluorite on white quartz. Both specimens are from the Yiwu mine.



Uses: Fluorite contains the element *fluorine*. Fluorine is used to make acids which are very important in industry. Fluorite is added to iron ore to make the iron come out of the ore at lower temperatures.

Name: The name *fluorite* comes from the Latin word *fluere* which means *to flow* because it melts easily and causes iron to melt easily. Fluorite is also called *Fluor Spar*.

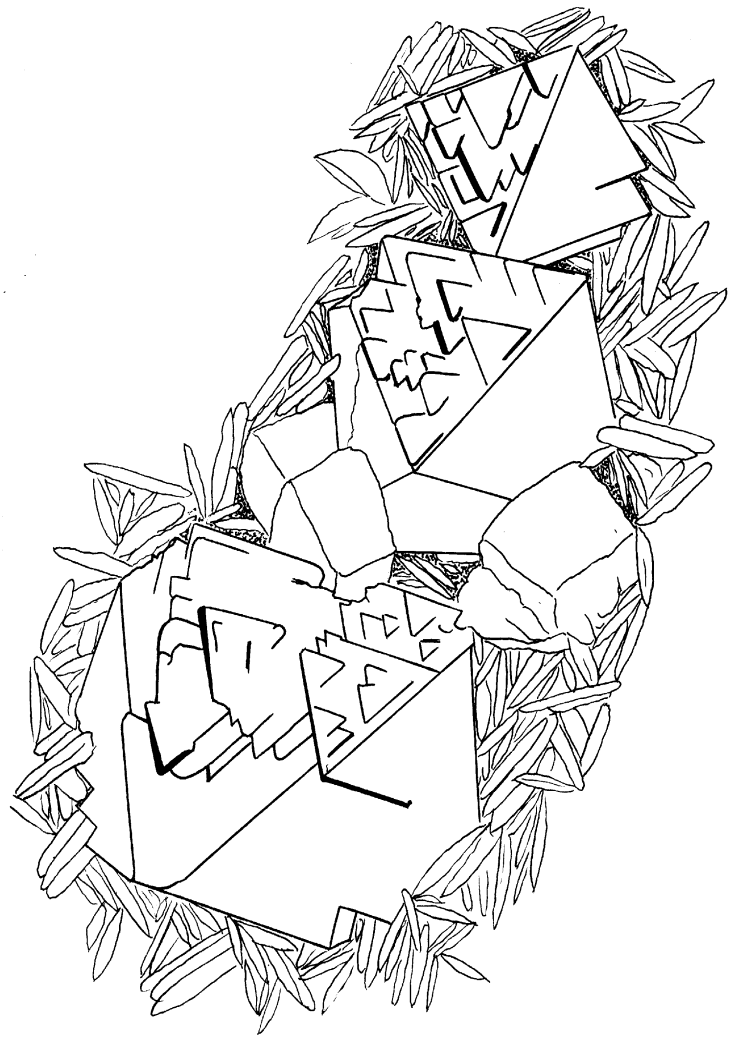
Color: Fluorite can be colorless, pink, green, yellow, blue, purple, brown, and sometimes b lack. Sometimes a single specimen can have more than one color.



Purple fluorite crystal from Yaogangxie mine, Hunan Province. It contains little bubbles of air and water. You can draw in the bubbles wherever you wish.

Scheelite

Xue Bao Diang Mountain, Sichuan Province



Uses: Scheelite is an important source of the element *tungsten*. Tungsten is added to steel to make it stronger and harder.

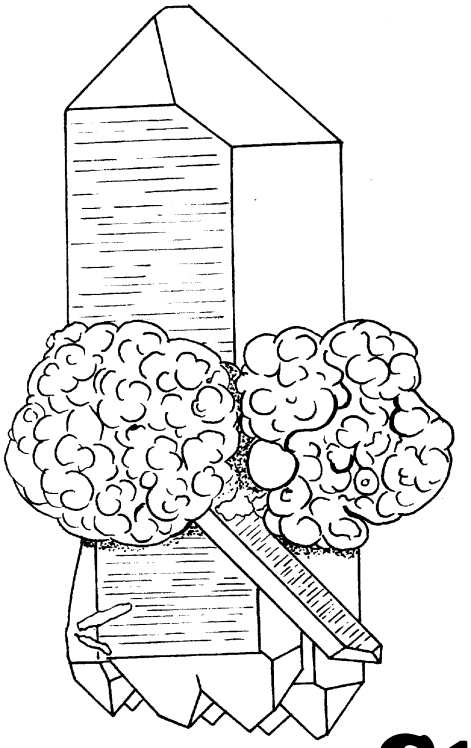
Name: Sometimes minerals are named after important people. Scheelite was named after the Swedish chemist, Karl Wilhelm Scheele (born in 1742 and died in 1786).

Color: These scheelite crystals are bright orange. It can also be yellow, green and gray. These scheelite crystals are sitting in golden tan mica crystals.

Chinese scheelite is usually fluorescent. Using books and the internet, explain what fluorescence is and why it occurs. Write your answer here.

Stannite

Yaogangxian mine, Hunan Province



Uses: Stannite is an ore of the metal *tin*, but it is not as important as cassiterite.

Name: *Stannite* is from the Latin word *stannum* which means *tin*, because this mineral is an ore of tin.

Color: Stannite looks like brass. It is shiny and golden.

Interesting Facts: Stannite is a very rare mineral. Here two "balls" of stannite have grown on white quartz crystals.

Stibnite

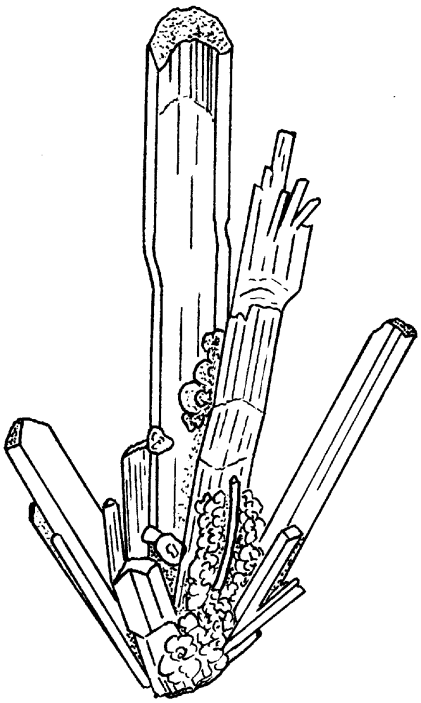
Dushan mine, Guizhou Province

Uses: Stibnite is the most important ore of the element *antimony*. Antimony is used in batteries and fireworks, medicine and glass making.

Name: Stibnite was named from the Latin word *stibium* which means *antimony*.

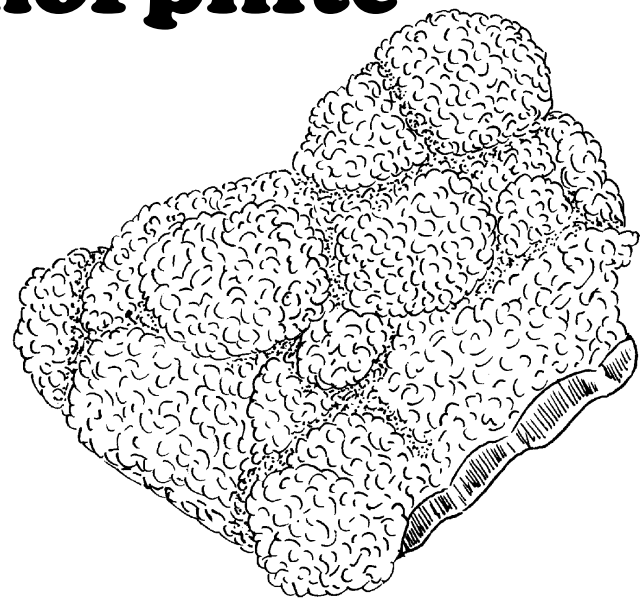
Color: Stibnite is shiny like metal (mineral collectors say it has a *metallic luster*) and is silvery gray.

Interesting Facts: Antimony was used as make up by the ancient Egyptians.



Hemimorphite

Wenshan



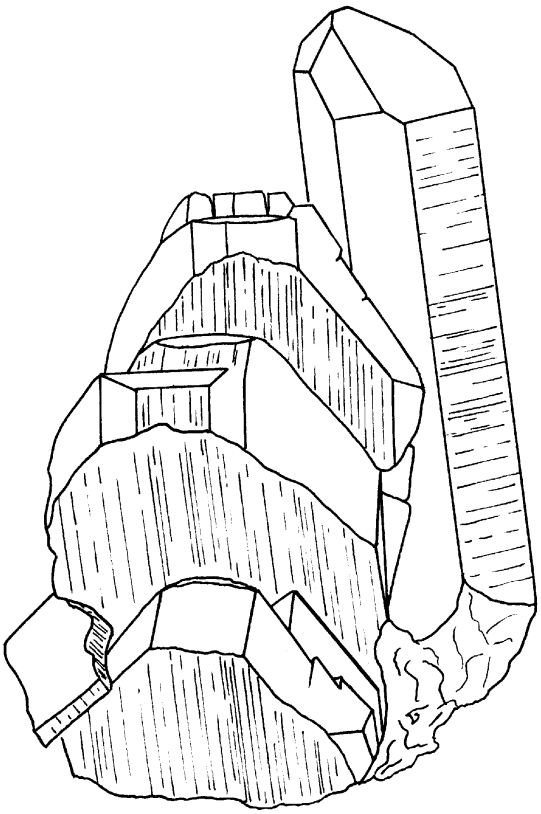
Uses: Hemimorphite is an ore of the element *zinc*.

Name: The ends of hemimorphite crystals can have two different shapes. Its name tells this story: *hemi-* means *half* and *morphe* means *shape*.

Color: Colorless, pink, blue, white. This specimen is light blue.

Wolframite

Yaogangxian mine, Hunan Province

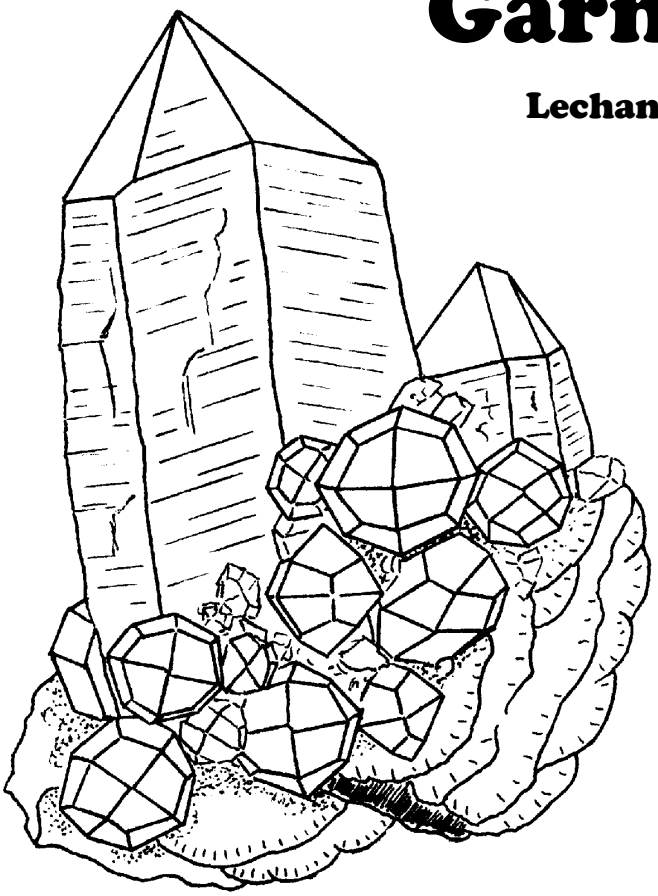


Uses: Wolframite is a source of the element *tungsten*. Tungsten is used to make light bulb filaments and to make steel stronger and harder.

Name: Wolframite was named from the old German words *volf* meaning *wolf* and *rahm* meaning *froth*. In the 1500's, Georgius Agricola, a famous mineralogist, said that a froth formed when wolframite was melted that looked like the froth made by a wolf eating its prey.

Color: Dark brown to black. The quartz is white.

Quartz & Spessartine Garnet



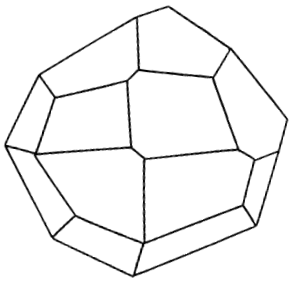
Lechang, Guangdong Province

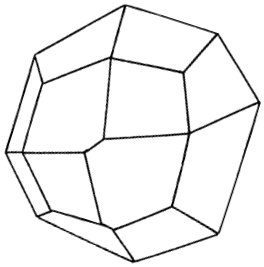
Uses: Garnet is used to make sandpaper and jewelry.

Name: *Garnet* is an ancient name. It comes from the Latin word *granatum* which means *a pomegranate* because garnet was thought to look like pomegranate seeds. (Buy a pomegranate at the store and cut it open to see the bright red seeds.)

Color: Spessartine garnet is orange red to red. The quartz is black (this is called *smoky quartz*).

To the right are two large garnet crystals. These crystals are called *dodecahedral crystals.* Draw some garnet crystals of your own here.



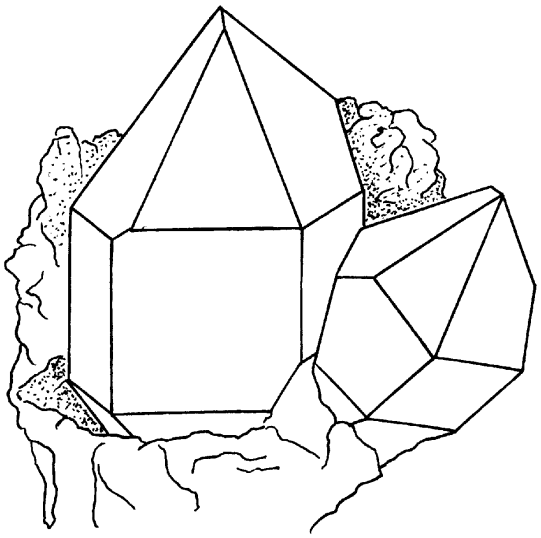


Quartz

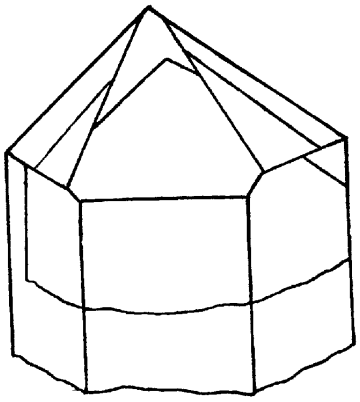
Uses: Quartz is used to make glass and jewelry. It is also used in watches and other scientific equipment. Quartz is one of the most common minerals in the Earth's crust.

Name: The name *Quartz* is thought to come from the ancient German word *quarz.*

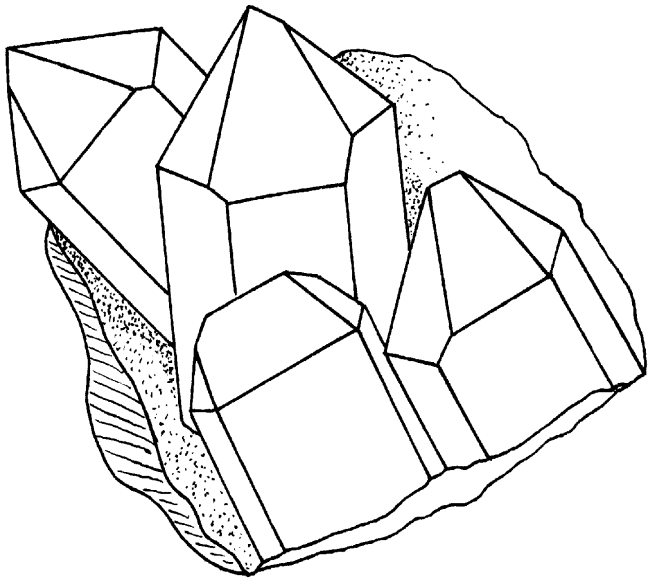
Color: Quartz comes in many colors including colorless (rock crystal), purple (amethyst), brown and yellow (citrine), black (smoky), white (milky), and pink (rose).



Amethyst crystals from the Daye mine, Hubei Province.



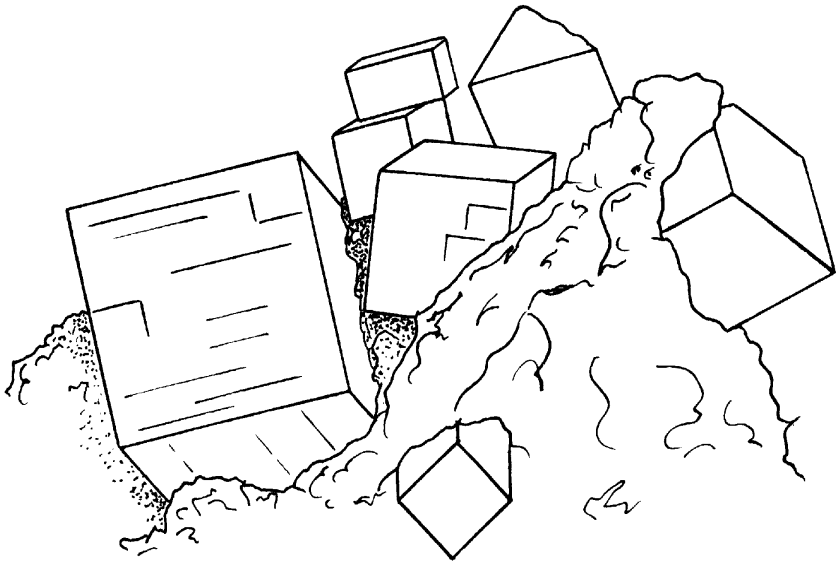
A small orange quartz crystal overgrown by a larger, clear quartz crystal. Mineralogists call this a *phantom crystal.*



Quartz crystals stained red by hematite. This specimen is from Lechang City, Guangdong Province.

Pyrite

Daye mine, Hubei Province

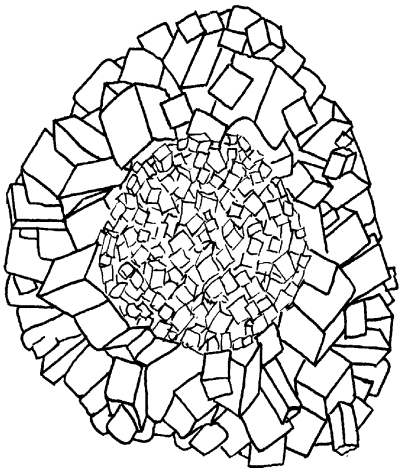


Uses: Pyrite contains iron and sulfur. It is a source of iron to make steel (which is used to make cars, buildings, furniture) and a source of sulfur (which is used to make chemicals and medicines).

Name: Pyrite was named from the Greek word *pyr* which means *fire*, because it sparks when it is hit with steel, like a hammer.

Color: Light yellow. It has a shiny, metallic luster, like brass.

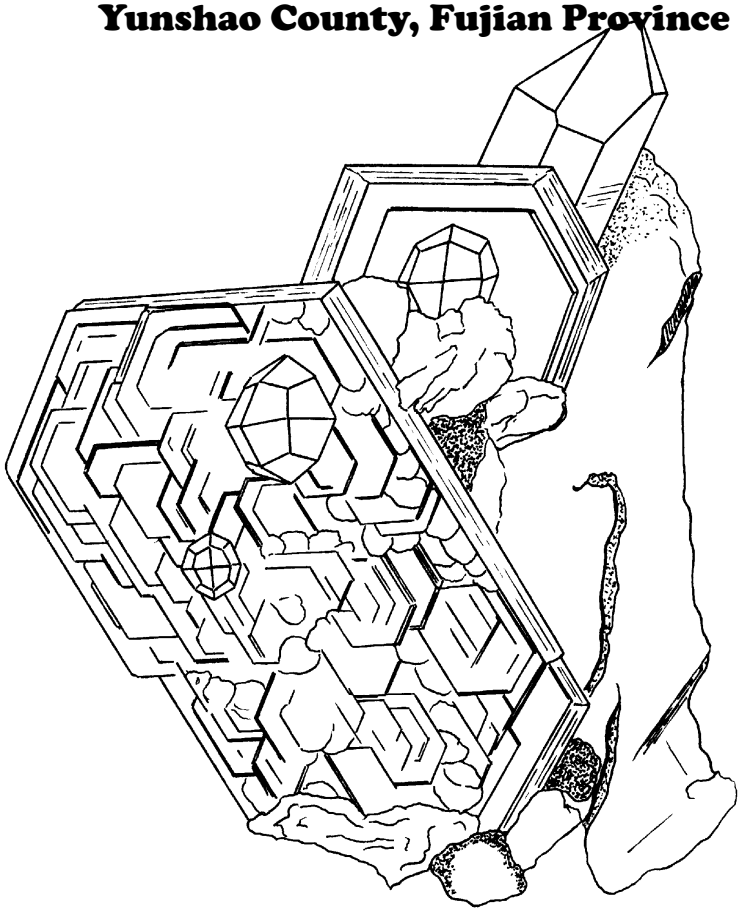
Interesting facts: Pyrite is one of the few minerals that can be found in all three types of rocks: igneous rocks, metamorphic rocks and sedimentary rocks.



A pyrite "sun" of large pyrite cubes that have grown around small pyrite cubes. From Luizhou, Guangxi Province.

Muscovite
With Spessartine Garnet and Smoky Quartz

Yunshao County, Fujian Province



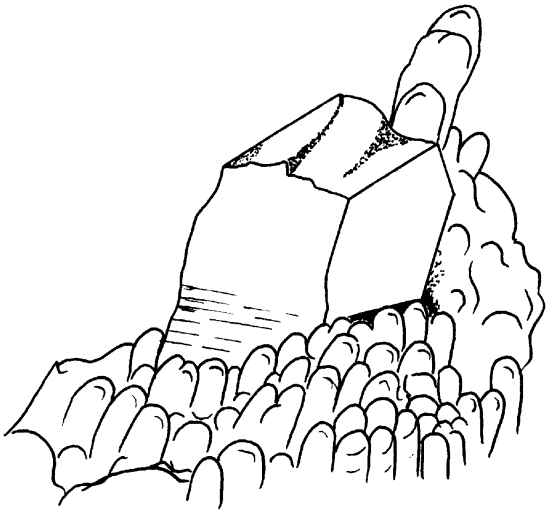
Uses: Muscovite has many uses. It is crushed and used for insulation. It is also used to make paper, rubber and paint.

Name: In the past, when people heated their homes by burning wood in stoves, the stoves would have windows. These windows were made of sheets of muscovite. The country of Russia was a one time called "Muscovy." This mineral was used there in wood burning stoves and was called Muscovy Glass. In the 1800's, the name was changed to *Muscovite*.

Color: Muscovite can be colorless, yellow, golden, green or even red. These crystals are silvery.

Azurite & Malachite

Guichi, Chizhou County, Anhui Province



Uses: Azurite is sometimes used to make jewelry. In the past, it was used to make blue paint. Malachite is used in decorating tables, making boxes and carvings, and in jewelry. Sometimes it is a copper ore.

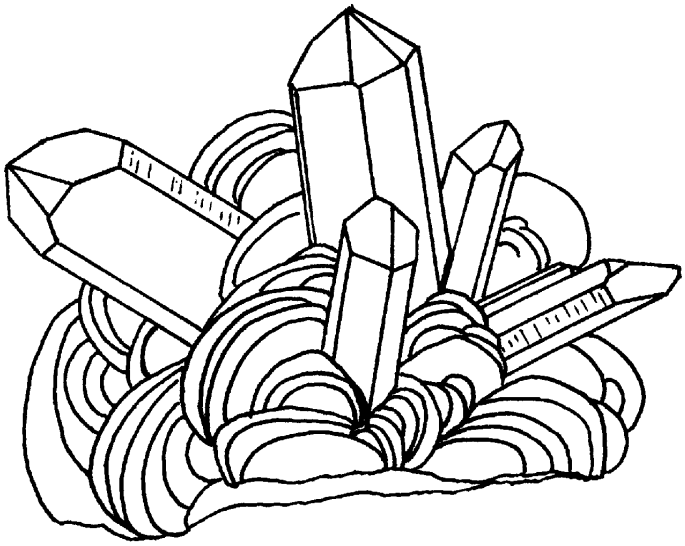
Name: *Azurite* was named after its blue (azure) color. *Malachite* is green. It was named from the Greek word *moloche* which means *mallow*. "Mallow" is a green plant.

Color: Azurite can be light blue to dark blue. Some specimens are so dark they look like they are almost black. Malachite is light green to dark green. It is often found in large masses that have alternating bands of light and dark green. This specimen from China has a large, dark blue azurite crystal sitting in a bunch of light green malachite "fingers."

Interesting Fact: Both malachite and azurite contain copper. Over time, azurite begins to turn green. Blue paint that was colored blue by azurite has turned green over many years.

Hematite with Quartz

near Lechang City, Guangdong Province



Uses: Hematite is the most important ore of iron. Iron is mixed with other metals to make steel which is used in buildings, cars, trucks, and homes.

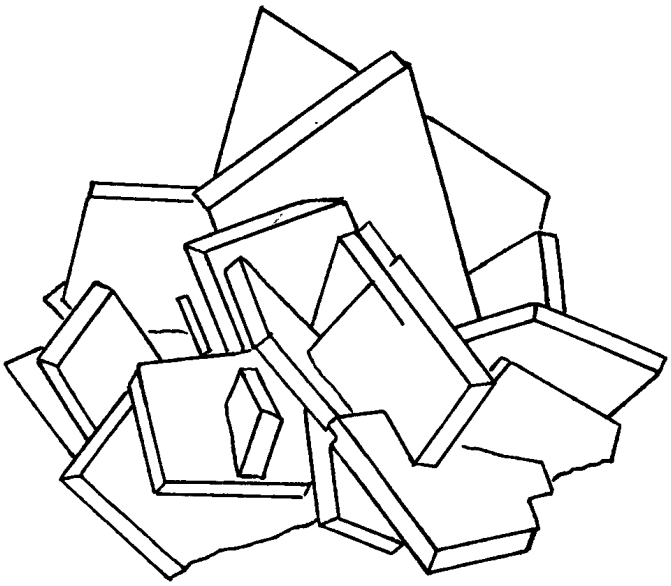
Name: Hematite was named from the Greek word *haimatites* which means *bloodstone* because all hematite, when it is crushed to a powder, is blood-red in color.

Color: The hematite blades in this picture are silver gray. Hematite can also be red or black. The quartz crystals that stick out from the hematite are colorless.

The physical property that easily identifies hematite is its *streak*. "Streak" is the color of a mineral when it is crushed to a powder. Hematite's streak is always *blood red*. List and define the other physical properties used to identify minerals. Write your answer here:

Barite

Hunan Province



Uses: Barite is used in drilling for oil, in making paper and rubber. It is also used in medicine. It is an ore of the element *barium*.

Name: Barite was named from the Greek word *baros* which means *heavy* because barite is an unusually heavy mineral.

Color: These crystals are golden yellow, but barite can also be white, blue, colorless, brown.

Pyrrhotite

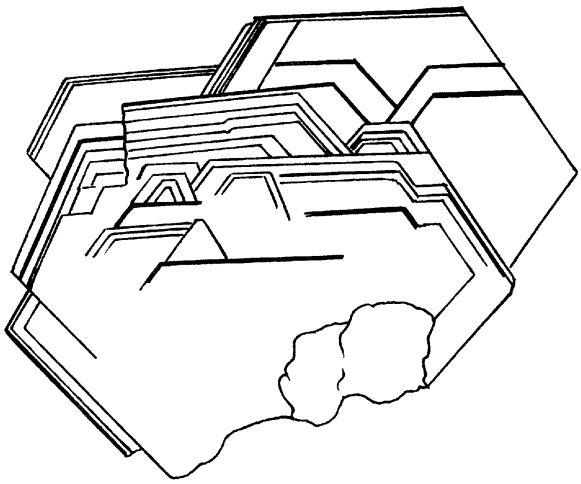
Yaoguangxian mine, Yizhang County, Hunan Province

Uses: Pyrrhotite is an interesting mineral to collectors, but doesn't have any important use.

Name: Pyrrhotite was named from the Greek word *pyrrotes* which means *redness*, because it has a reddish color.

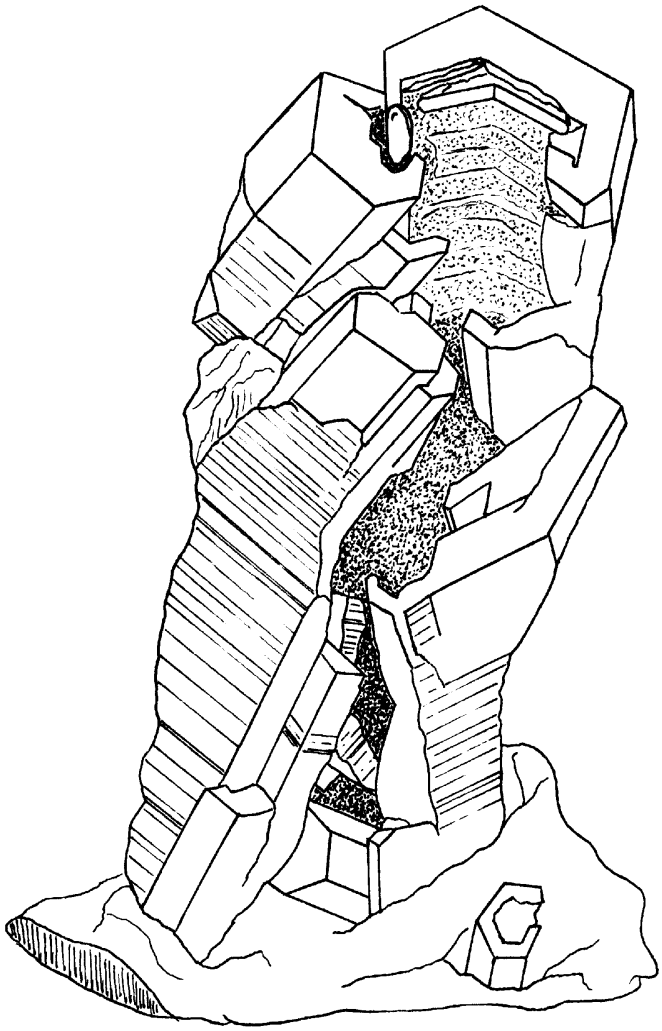
Color: These specimens are dark, and look like bronze with a reddish tint.

Interesting facts: When pyrrhotite is crushed to a powder, the powder is magnetic. Pyrrhotite often crumbles and falls apart in collections.



Pyromorphite

Daoping Lead Zinc mine, Guangxi

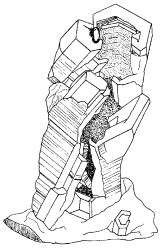


Uses: Pyromorphite contains *lead*, and is sometimes a lead ore. Its beautiful shape and color make it a favorite mineral for collectors.

Name: Pyromorphite was named from the Greek words *pyr* which means *fire* and *morphe* which means *form*, because this mineral will melt into a liquid ball (like a drop of water) but when it cools, it turns into a crystal again!

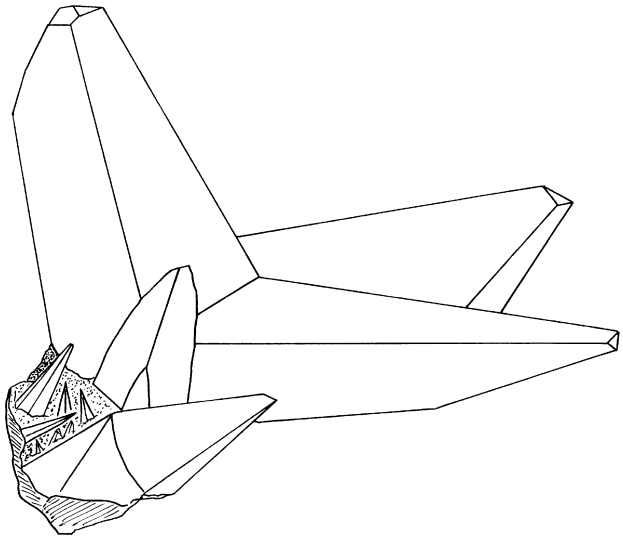
Color: Pyromorphite can be green, brown or colorless. These specimens from China are bright grass green.

Actual size of this specimen (3.6 cm)⇨



Calcite

Lei Ping mine, Hunan Province



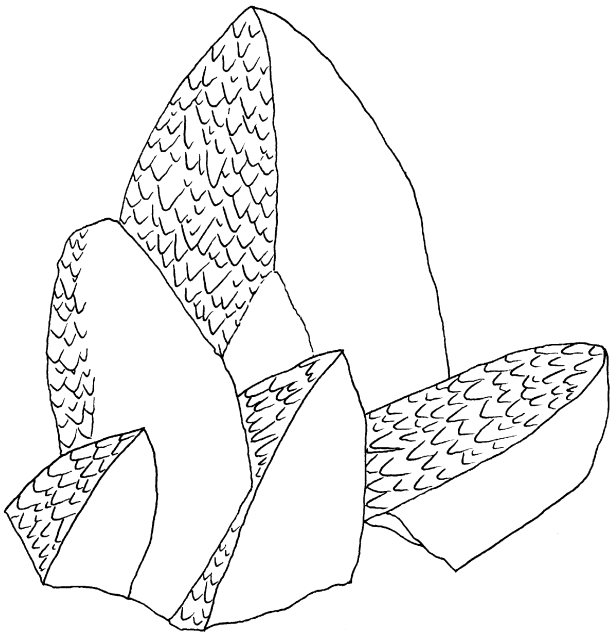
Bright orange calcite crystals. Calcite forms more crystal shapes than any other mineral (over 600 different shapes in all!) These crystals are called *Dogtooth Crystals* because they look like a dog's fangs.

Uses: Calcite has many different uses. It is used to make cement and in removing metals from their ores. It is used in fertilizer and in different chemicals used in industry. It is used in the process of making rubber and in paint.

Name: Calcite was named from the Latin word *calx* which means *burnt lime*.

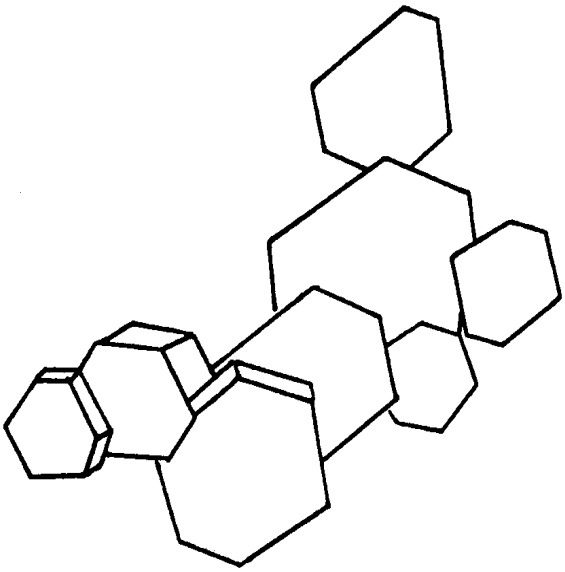
Color: Calcite can be found in many colors including colorless, white, brown, yellow, golden, tan, green, blue, black, red, orange, white and gray.

These calcite crystals are large crystals made up of thousands of small crystals. They are interesting because they are brown on one side and white on the other. Color the sides with the small crystals brown. You can draw in more small crystals if you wish.



Mimetite

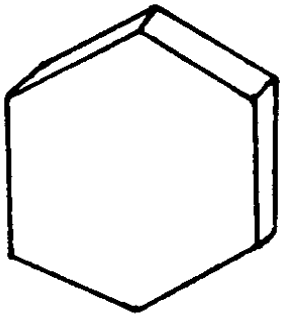
Pingtouling mine, Guangdong Province

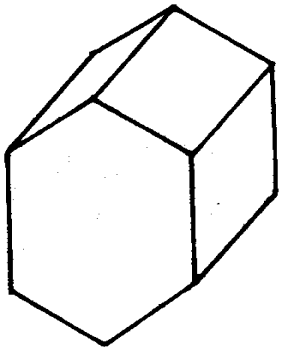


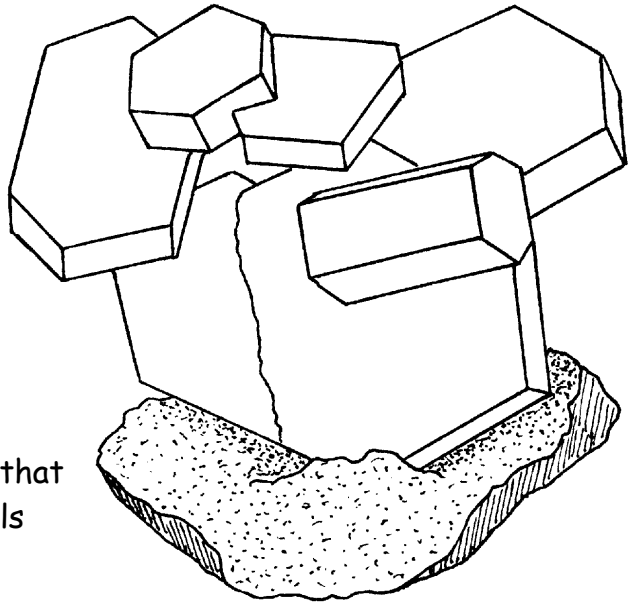
Uses: Mimetite contains lead and sometimes is a source for lead. It is a popular mineral with collectors because of its color and shape.

Name: Mimetite is very much like the mineral pyromorphite: they have the same crystal shape, they often look the same, they are found in similar rocks and have similar chemical formulas. Mineralogists said that mimetite imitates pyromorphite. Therefore, it was named after the Greek word *mimetes* which means *imitator*.

Color: Colorless, orange and sometimes yellow to yellowish brown.





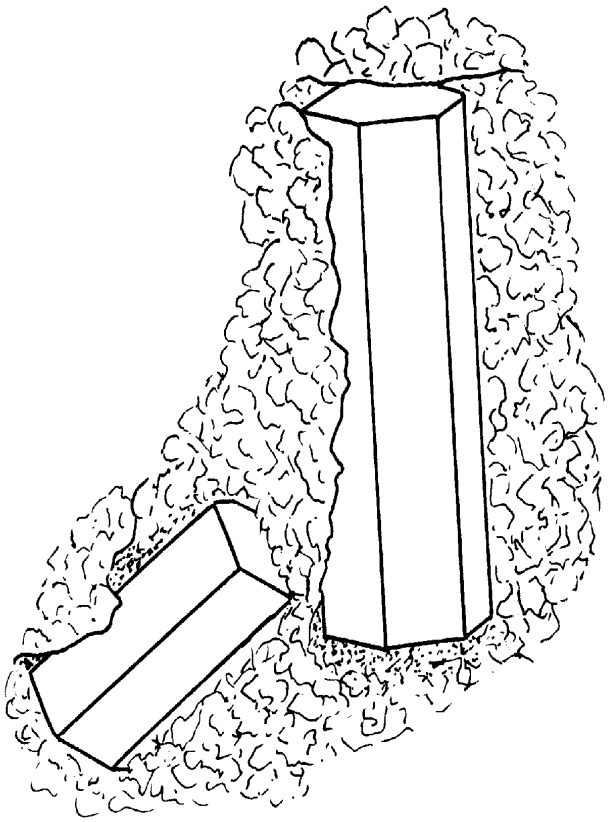


Orange mimetite crystals. Notice that they all have six sides. The crystals can be thin or thick.

Beryl var. Emerald

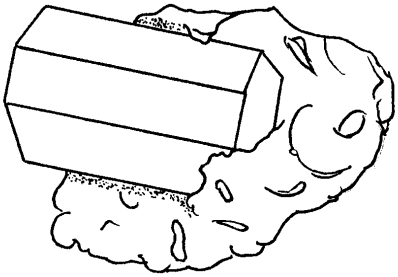
Hunan Province

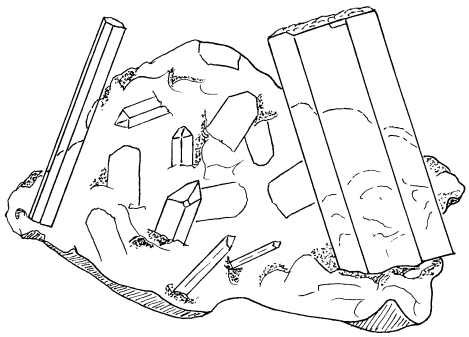
Uses: Emerald is a very valuable gemstone. High-quality emeralds are more valuable than diamonds! Emerald is a variety of the mineral *beryl*. Beryl is the most important source of the element *beryllium* which is used to make metal that is light and strong to make airplanes.



Name: The name *emerald* came from a Greek word, *smaragdos,* which means *a light green stone*. The name *beryl* is believed to come from another Greek word, *beryllos*, which is a place in India near deposits of gemstones.

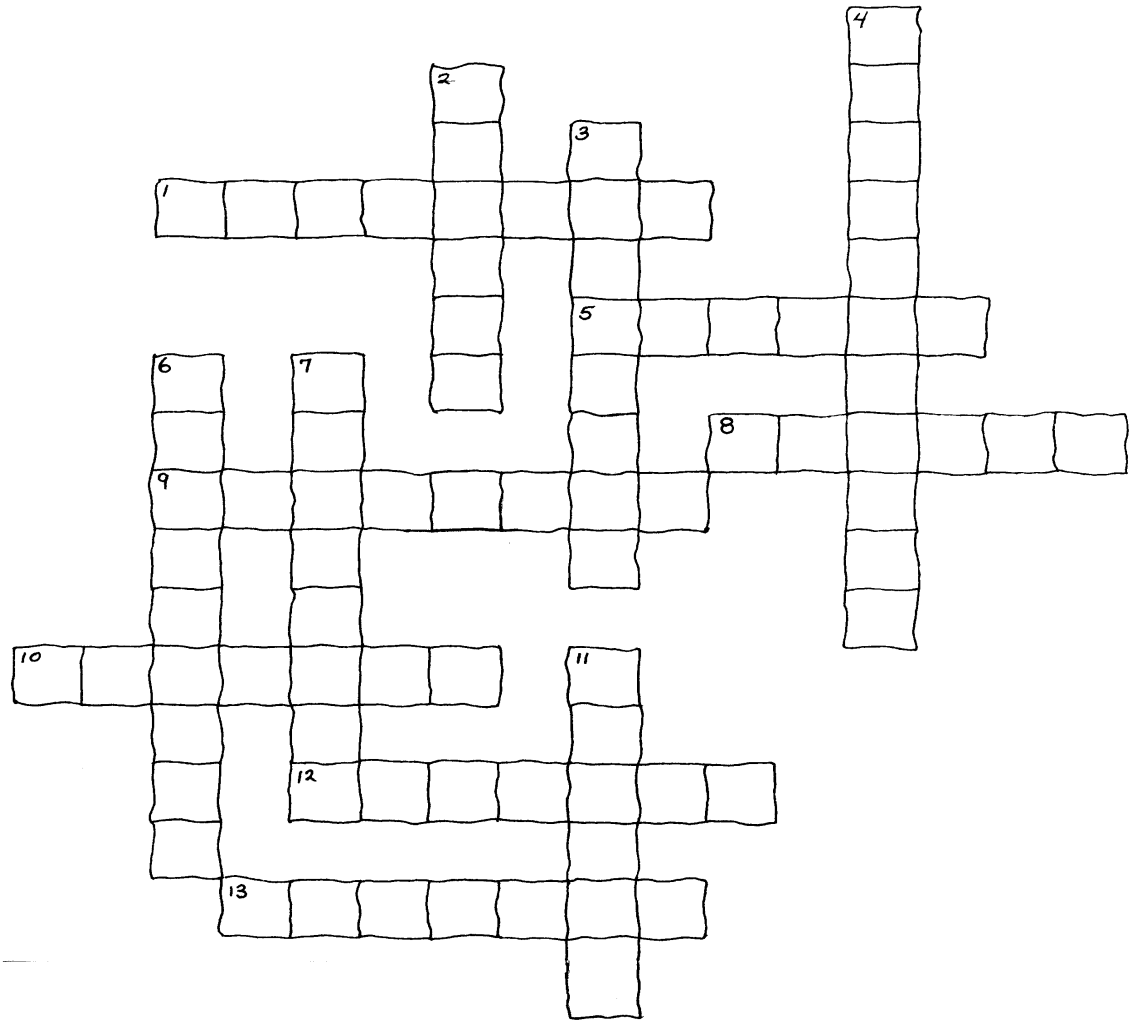
Color: Emerald is dark green. Beryl can also be yellow (heliodor), red, light blue (aquamarine), pink (morganite).





Left: Red beryl from the United States. Right: Yellow beryl (Heliodor) from Russia. Notice that all beryl crystals have 6 sides.

Mineral Crossword Puzzle



1. (Across) _____ contains the element *fluorine*.
2. (Down) Crushed _____ is used to make sandpaper.
3. (Down) _____ is an important ore of the element *antimony*.
4. (Down) _____ is an ore of *tin*.
5. (Across) _____ is useful in drilling for oil because it is so heavy.
6. (Down) _____ is an ore of the element *tungsten* which is used to make steel stronger and harder.
7. (Down) The mineral _____ is very much like the mineral pyromorphite.
8. (Across) _____ is named from the Greek word that means "fire."
9. (Across) _____ is an important iron ore.
10. (Across) _____ can form over 600 different crystal shapes!
11. (Down) _____ is used to make glass.
12. (Across) _____ is the green variety of the mineral *beryl*.
13. (Across) _____ contains copper.

Mineral Match

What have you learned? Match the mineral names on the left with the mineral pictures on the right.

Pyrite

Fluorite

Wolframite

Pyromorphite

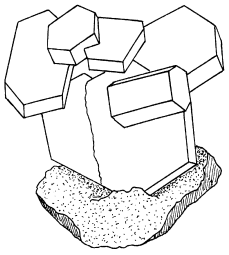
Hematite

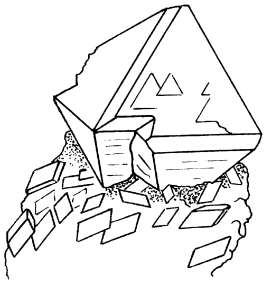
Calcite

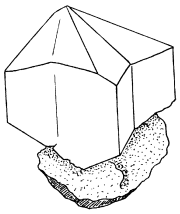
Cinnabar

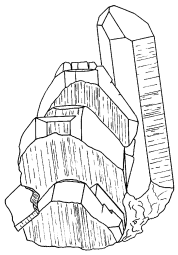
Mimetite

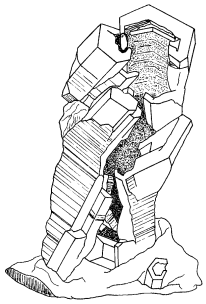
Cassiterite

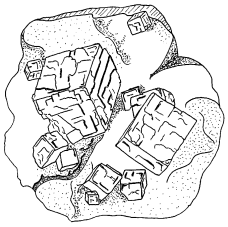


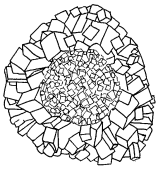


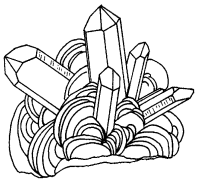


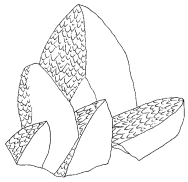












Mineral Word Search

Below are the names of some of the minerals found in China. Can you find them? The names can run left to right, right to left, up, down and diagonally. Good luck!

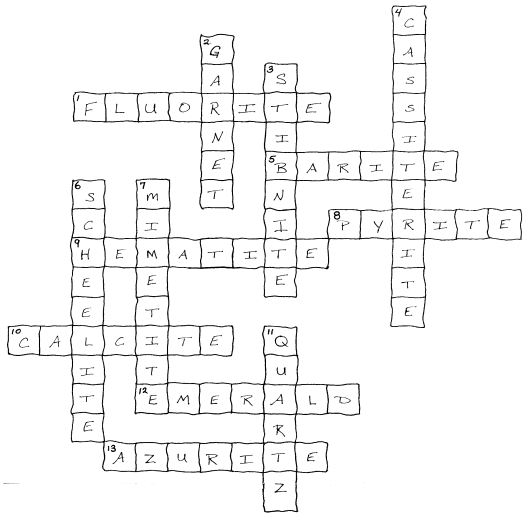
S	T	I	B	N	I	T	E	T	I	T	A	M	E	H
T	S	Q	P	Y	R	O	M	O	R	P	H	I	T	E
A	M	U	X	Y	S	M	T	L	E	T	N	M	I	M
N	O	A	Z	U	R	I	T	E	A	E	G	E	R	I
N	K	R	H	G	C	R	U	P	S	N	R	T	O	M
I	Y	T	A	A	H	S	H	I	L	R	E	I	U	O
T	Q	Z	N	R	I	D	T	O	I	A	C	T	L	R
E	U	L	N	N	N	E	O	M	T	G	L	E	F	P
G	A	M	A	E	A	E	L	I	O	I	A	J	M	H
O	R	J	H	T	T	I	D	C	O	Q	T	B	I	I
L	T	U	T	I	Z	D	L	A	R	E	M	E	K	T
D	Z	I	C	A	M	E	T	H	Y	S	T	R	E	E
F	E	L	D	S	P	A	R	E	T	I	R	Y	P	A
B	A	A	R	O	N	K	E	T	I	M	O	L	O	D
C	I	N	N	A	B	A	R	X	Y	E	L	S	E	W

Amethyst
Azurite
Beryl
Calcite
Cinnabar
Dolomite
Emerald
Feldspar
Fluorite
Garnet (x2)
Gold
Hematite
Hemimorphite
Inesite
Mica
Mimetite
Pyrite
Pyromorphite
Pyrrhotite
Quartz
Smoky Quartz
Stannite
Stibnite
Talc

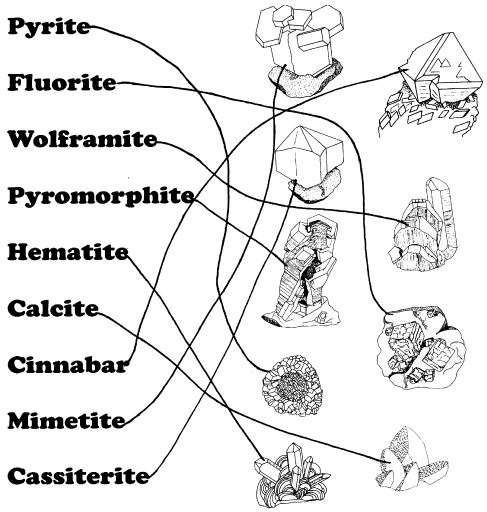
China

Answers

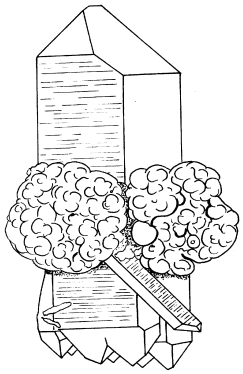
Mineral Crossword Puzzle



Mineral Match



Mineral Word Search



S	T	I	B	N	I	T	E	T	I	T	A	M	E	H
T	S	Q	P	Y	R	O	M	O	R	P	H	I	T	E
A	M	U	X	Y	S	M	T	L	E	T	N	M	I	M
N	O	A	Z	U	R	I	T	E	A	E	G	E	R	I
N	K	R	H	G	C	R	U	P	S	N	R	T	O	M
I	Y	T	A	A	H	S	H	I	L	R	E	I	U	O
T	Q	Z	N	R	I	D	T	O	I	A	C	T	L	R
E	U	L	N	N	N	E	O	M	T	G	L	E	F	P
G	A	M	A	E	A	E	L	I	O	I	A	J	M	H
O	R	J	H	T	T	I	D	C	O	Q	T	B	I	I
L	T	U	T	I	Z	D	L	A	R	E	M	E	K	T
D	Z	I	C	A	M	E	T	H	Y	S	T	R	E	E
F	E	L	D	S	P	A	R	E	T	I	R	Y	P	A
B	A	A	R	O	N	K	E	T	I	M	O	L	O	D
C	I	N	N	A	B	A	R	X	Y	E	L	S	E	W