Rocks and Minerals

Lake Shelbyville Eco-Meet

2024 Junior Varsity

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TABLE OF CONTENTS

INTRODUCTION

The study of rocks and minerals is an appropriate beginning to the appreciation of nature. Rocks provide a looking glass into the past to help uncover the mysteries of how the earth was formed. In addition, rocks and minerals are the cornerstone of our present society. At one time, flint was carved into fierce arrowheads and tools. Obsidian, viewed as a valuable commodity, was traded between tribes and used as one of the first currencies. Today, coal is used in power plants to generate electricity; building and monuments are erected out of granite; and gold is found adorning many fingers. This study guide provides an overview of many rocks and minerals found in Illinois—some native and others brought by the movement of the glaciers. Our study begins with a look at what constitutes a rock and a mineral.

DEFINING ROCKS

A rock is made up of two or more minerals which have been joined through particular conditions of heat and pressure. In fact, rocks have been referred to as "mineral environments," some consisting almost entirely of one mineral, while others are a mixture. There are many common names for rocks, which typically refer to the size of the rock:

- *Mountain*: huge, giant hunk of rock that is still attached to the earth's crust; does not move; tall
- *Boulder* : large; taller than a person
- *Rock*: large, you can get your arms around it or a bit smaller; usually jagged
- *River Rock*: round rocks that are along the edge and at the bottom of fast-flowing rivers
- *Stone* : medium; you can hold it in two hands
- *Pebble*: small; you can hold it with two fingers; could get stuck in your shoes; usually rounded
- *Sand*: made up of tiny pieces of rock and grains of sand
- *Grain*: tiny; like a grain of rice or smaller; often found on a beach
- *Dust*: really fine powder that is mixed in with sand or soil
- *Speck* : as in a speck of dirt

TYPES OF ROCKS

The following are the three types of rocks:

1. Igneous—Such rock is formed by cooled lava, which either spilled out onto the surface (extrusive igneous rocks) or is molten rock trapped below the surface (intrusive igneous rock).

2. Sedimentary—This rock is formed from moderate pressure applied by layers of accumulated sediment. It often consists of deposits of weathered rock fragments.

3. Metamorphic—Such rocks form under conditions of intense heat, pressure, or both, which alter the original mineral composition. They are formed at considerable depths within Earth from older rock.

DEFINING MINERALS

A mineral is a naturally occurring chemical compound, which can be expressed by a single chemical formula. It may be a single element or a combination of any relatively stable elements. At least 3,000 different minerals have been identified, with new ones being discovered each year.

PROPERTIES OF MINERALS

Color, luster, specific gravity, crystal form, hardness, and streak are all properties used to study and identify minerals.

COLOR

Although most people think of color as an important characteristic used to describe a specimen, it is not very useful in identifying a mineral. Some minerals are nearly always the same color, such as sulfur (yellow) and azurite (blue), while many minerals come in a variety of colors. Some of the color variations can be attributed to slight chemical impurities or exposure to heat. Color can also change when the mineral is exposed to moisture and air causing the surface to tarnish or oxidize.

Color can be described as metallic or non-metallic:

Metallic Colors Include:		Non-Metallic Colors Include:	
COLOR	EXAMPLE	COLOR	EXAMPLE
Golden, Golden Yellow	Gold; Pyrite	Colorless	Quartz; Halite; Selenite
Bronze	Chalcopyrite	White, Beige, Creamy	Calcite; Gypsum; Mica; Talc
Copper, Copper-Red	Copper	Green	Jade; Feldspar
Silver, Silver-Grey	Galena; Silver	Red, Reddish-Brown	Granite
		Black, Gray	Titanite

The intensity of a mineral's color can be described by any of the following words:

- Dark
- Very dark
- Light
- Pale
- Deep
- Dull
- Shiny
- Bright.

The distribution of a mineral's color can be described using any of the following words:

- Streaked
- Splotchy
- Mottled
- Speckled
- Layered
- Banded

LUSTER

Luster refers to the reflection of light from the mineral's surface. The following words can be used to describe luster:

- Sub- metallic
- Metallic
- Shiny
- Shimmering
- Frosty
- Pearly
- Silky
- Glassy, Vitreous
- Resinous

SPECIFIC GRAVITY (SG)

Specific gravity indicates how many times more an object weighs than an equal amount of water. For example, the specific gravity of silver is 10.5. Therefore, a bucket of silver would weight 10.5 times as much as a bucket of water. This is why we think of metals as being heavy. They are heavy when compared to other things that we are used to picking up. This is also known as the heft of an object. The average rock you pick us has a specific gravity of about 2.75, because most of the earth's crust is made up of quartz (SG 2.65), calcite (SG 2.7), and feldspar (SG 2.56).

Specific Gravity of Familiar Objects	
OBJECT	SPECIFIC GRAVITY
Freshly fallen snow	0.16
Corn on the cob	0.72
Granulated Sugar	0.85
Water	1.0

CRYSTAL FORM

Crystal form refers to the shape of the crystal. When minerals have the time and space to grow into their crystal forms, they grow into beautiful, regular shapes that are easy to recognize once you have seen a few examples.

The following are some words that are used to describe crystal forms or shapes:

- ***Acicular/Radiating Needles***—crystals that grow in fine needles
- ***Blebs***—rounded blobs
- ***Botryoidal***—looks like the top of a bunch of grapes
- ***Concretion***—spherical, round shape that is solid; the same all the way through or filled with layer or agate
- ***Cubic***—six equal square faces
- ***Dendritic***—branching; tree-like; looks like the veins of a leaf
- ***Dodecahedron***—12-sided; like a 12-sided die

HARDNESS

A mineral's hardness is determined by its ability to resist scratching and abrasion. A German mineralogist, Friedrich Mohs, established a hardness scale from one to ten, which references minerals to each number (one being the softest and ten being the hardest).

Comparison Mineral	Hardness Scale	Scratch Test Tool
talc	1	scratches with a fingernail
gypsum	2	scratches with a fingernail
calcite	3	scratches with a copper coin
fluorite	4	scratches with a nail/knife blade
apatite	5	scratches with a nail/knife blade
feldspar	6	scratches with a steel knife
quartz	7	scratches window glass or steel
topaz	8	scratches glass
corundum	9	scratches topaz
diamond	10	scratches corundum

Cleavage occurs when a mineral breaks with smooth, flat surfaces. Cleavage can be described as perfect, good, imperfect, or poor.

Fracture occurs when a mineral breaks, but the surface is not regular and does not show cleavage. The following words can be used to describe what a fracture in a rock or mineral looks like:

- ***Conchoidal***—curved break like what happens with thick glass or a bottle bottom; shell-shaped
- ***Jagged***—metals; sharp point that scratches or snags fingertips
- ***Splintery***—fibrous
- ***Uneven***—rough surface; not smooth

STREAK

Streak refers to the color of the powder a mineral leaves after it has been rubbed on an unglazed porcelain streak plate. Note that this is not always the same color as the original mineral.

IDENTIFYING ROCKS

Coal

HARDNESS: < 3
STREAK: N/A
ENVIRONMENT: mines, quarries, fields, outcrops
WHAT TO LOOK FOR: black, shiny, lightweight material found in sedimentary rocks or in quarries
SIZE: masses of coal can occur in any size
COLOR: dark gray to black, brown-black
NOTES: Long used as a combustible fossil fuel, coal is a light-weight black material consisting of fossil plant matter that never fully decayed. When aquatic plants die in acidic water that lacks oxygen, decomposition can halt, causing the plant matter to build up. Over time, overlying sediment can compress that material, concentrating the plants' carbon into beds. As the pressure increases, coal begins to form, first as lignite, a soft, woody variety of coal, and eventually resulting in anthracite, the final form of coal, which is created only under high-pressure. Anthracite coal has undergone enough change that it is actually considered a rock. Thanks to the upper Midwest's aquatic past, coal deposits are common, and it is mined throughout the region. Identification is simple due to coal's soft and lightweight nature, its very shiny luster and its combustibility. If the region's coal had been subjected to further increasing pressure, purer forms of carbon could have resulted, including graphite and diamond (unfortunately for collectors, this didn't happen).

Conglomerate/Breccia


Conglomerate


Breccia

HARDNESS: N/A
STREAK: N/A
ENVIRONMENT: rivers, quarries, road cuts, outcrops
WHAT TO LOOK FOR: rocks that appear to be made up of many smaller rocks that have been cemented together
SIZE: conglomerate and breccia can be found in any size
COLOR: varies greatly; mottled and multicolored
NOTES: Conglomerate and breccia are two sedimentary rocks that formed when smaller stones were cemented together into one large mass by a fine-grained sediment. The stones within conglomerate and breccia can consist of almost any type of rock, depending on what was available when the conglomerate or breccia formed. Both have a coarse, uneven texture and a mottled coloration, but where they differ is the shape of the embedded rocks. Conglomerate formed in aquatic conditions where many rounded, smoothed stones settled together, whereas breccia developed when preexisting rock was crushed or violently broken, such as in a meteor impact, which produced jagged, sharp rock fragments. In either case, smaller sediments like sand and clay filled the spaces between the stones, and minerals like quartz, calcite, and goethite were later deposited by water to cement all the material together. Since most sedimentary rocks, such as sandstone, typically exhibit a consistent grain size, conglomerate and breccia's unique texture is very apparent and differs greatly from other rock types.

Gneiss

HARDNESS: N/A
STREAK: N/A
ENVIRONMENT: outcrops, road cuts, mines, quarries
WHAT TO LOOK FOR: hard, dense, layered rocks of varying grain size that often contain pockets of very hard minerals
SIZE: can be found in any size
COLOR: varies; typically multicolored white to gray, black, green
NOTES: Gneiss (pronounced "nice") is a perfect example of the process of metamorphism and is a general term used to describe rocks with loosely defined layers of minerals that were rearranged and compressed. Often described as having less than half of its minerals concentrated into layers, gneiss retains much of the original rock's appearance. Varieties are named for their parent rock, so granitic gneiss, for example, formed from granite and therefore retains many of its traits (but with noticeable layering).

Granite

HARDNESS: N/A
STREAK: N/A
ENVIRONMENT: quarries, road cuts, outcrops, lakeshores, rivers, fields
WHAT TO LOOK FOR: coarse-grained rock containing grains of many different minerals, each visible with the naked eye
SIZE: can be found in any size
COLOR: varies greatly; multicolored, primarily in shades of tan, orange or red to pink, white to gray, brown, and black
NOTES: A perfect example of an igneous rock, granite formed when magma (molten rock) buried deep within the earth cooled very slowly. Because granite "cooked" for a long time, its minerals crystallized to a large, visible size, giving granite its characteristic mottled appearance. Granite's mineral grains are fairly uniform in size, and it is predominantly light colored with darker minerals present as small spots. But, when the ratio of granite's minerals changes, it is classified as a different type of rock. Diorite is an example of a granite-like rock that has more dark minerals than true granite.

Limestone

HARDNESS: 3-4
STREAK: N/A
ENVIRONMENT: all environments
WHAT TO LOOK FOR: soft but tough, compact light-colored rock with a chalky feel that is abundant in flatter regions
SIZE: can be found in any size
COLOR: commonly white to tan or brown, also light to dark gray
NOTES: Limestone is the most common rock in the region. It formed at the bottom of the shallow marine seas that inundated the area millions of year ago, forming from the remains of microscopic organisms, animal shells, and coral that settled into thick beds. These organic sediments, which consisted of unstable aragonite, slowly converted to calcite and solidified into limestone—which consists of over 50 percent calcite, along with dolomite, clay, and a small amount of quartz. Due to its high calcite content, limestone is fairly soft and easily scratched with a knife, and it will effervesce (fizz) in acids as weak as undiluted vinegar. Typically white, tan or gray, it develops a chalky white color and texture when a specimen has been worn, particularly on weathered edges. All of these traits will help you distinguish it from other sedimentary rocks. Limestone is also a common host to fossils of ancient sea life and often has cavities filled with fine crystals of calcite and other minerals.

Quartzite

HARDNESS: ~7
STREAK: N/A
ENVIRONMENT: all environments
WHAT TO LOOK FOR: very hard, grainy rock with the general appearance and characteristics of quartz
SIZE: can be found in any size
COLOR: white to gray finds are common; often stained red to brown, yellow, or green to black; occasionally banded
NOTES: Quartzite is a metamorphic rock that forms when sandstone is altered; quartzite can form in two different ways. Sandstone can be compressed and heated, causing the sand grains within it to fuse together; quartzite can also form when sandstone is impregnated by silica (quartz) solutions, which then crystallize into quartz between the grains. Because sand consists primarily of grains of quartz, quartzite is composed almost entirely of quartz. It is therefore very hard, tough, and water-resistant and is often found in glacial till and along rivers as rounded stones. It is generally light colored, though it's often stained darker by impurities, and it may be translucent. It is very easy to confuse with typical quartz, but quartz is always more translucent and appears glassier when broken. Quarzite also has more of a grainy, flaky texture than quartz, especially under magnification.

Sandstone

HARDNESS: N/A
STREAK: N/A
ENVIRONMENT: all environments
WHAT TO LOOK FOR: rocks with a very gritty texture and granular nature, often easily picked apart with your fingernails
SIZE: can be found in any size
COLOR: varies greatly; generally red to brown or yellow, sometimes layered, and less commonly gray to green
NOTES: Sandstone gets its name from the particles it consists of. Sand is a sediment we're all familiar with; it consists of detrital particles no larger than $^{1}/_{12}$ of an inch and is primarily made up of quartz. Sand turned to sandstone when it settled into beds at the bottoms of ancient lakes and seas, where it was later compressed by pressure from above; other minerals, particularly clay and calcite, formed between the grains, cementing them together. Sandstone therefore has a rough, gritty texture, and individual grains of sand are often easy to separate with only your fingernails. Under magnification, quartz grains are easily visible, and layers of varying coloration are common.

Shale

HARDNESS: < 5.5
STREAK: N/A
ENVIRONMENT: all environments
WHAT TO LOOK FOR: soft, fine-grained rocks in flat, layered, sheet-like formations; layers can be separated with a knife
SIZE: can be found in any size
COLOR: tan to brown, gray to black
NOTES: The inland seas that repeatedly inundated the region left behind many kinds of sedimentary rocks. Shale, consisting of layers of compacted, solidified mud, is among the most common and formed at the bottom of very still bodies of water. Shale consists of microscopic grains of weathered rocks and minerals, particularly micas, clays, and quartz, which were periodically deposited and hardened into layers. As a result, shale is a soft rock and can easily be scratched with a knife. It's easy to identify thanks to its layering and habit of softening when soaked in water. In addition, shale's layers are often easily separated with a knife blade and come apart in distinct thin, flat layers; fossils are often found between layers.

IDENTIFYING MINERALS

Calcite

HARDNESS: 3
STREAK: White
ENVIRONMENT: all environments
WHAT TO LOOK FOR: light-colored, six-sided pointed crystals or blocky masses or veins that are easily scratched with a nickel; breaks into a "leaning cube" shape
SIZE: crystals and masses can measure up to several inches
COLOR: colorless to white most common; often yellow to brown
NOTES: Composed of calcium carbonite, calcite can form in nearly any geological environment, but is particularly prevalent within the region's sedimentary rocks. It has several hundred known crystal forms, but it most commonly appears as elongated, steeply angled hexagonal points, which are sometimes pointed at both ends. It also frequently develops as rhombohedrons (a shape resembling a leaning cube). Irregular crusts, veins, or masses of calcite are the most common find, but calcite is easy to identify in any form. Generally light colored and fairly soft, calcite is easily scratched by a nickel, distinguishing it from quartz. Calcite effervesces (fizzes) in acids; test it with undiluted vinegar.

Feldspar

HARDNESS: 6-6.5
STREAK: White
ENVIRONMENT: all environments
WHAT TO LOOK FOR: abundant, hard, light-colored masses embedded in granite, or blocky, angular crystals in cavities
SIZE: varies greatly; masses or grains range from tiny flecks to an inch or more in size; crystals can be up to fist-sized
COLOR: white to gray, pink to orange, tan to brown
NOTES: Present in some form within nearly every type of rock, feldspars are one of the major building blocks of our planet, comprising nearly 60 percent of the earth's crust. But, "feldspar" is just a general term for the entire group, which is actually divided into two subgroups: potassium feldspars ("K-spars," for short), such as the very common orthoclase and microcline, and the plagioclase feldspars, such as albite and anorthite. K-spars are abundant in light-colored rocks like granite and pegmatite as embedded, light-colored, opaque blocky masses or grains, or more rarely as large crystals with low-angled tips. Plagioclase feldspars, on the other hand, are often only found in dark rocks as glassy grains. When embedded, all feldspars can be difficult to identify; to identify them, look for finds that are opaque, have a high hardness and exhibit rectangular or blocky shapes. Many specimens also exhibit a pearly sheen or internal schiller, which is distinctive, as is feldspar's blocky cleavage.

Fluorite

HARDNESS: 4
STREAK: White
ENVIRONMENT: quarries, mines, outcrops
WHAT TO LOOK FOR: glassy, translucent masses or cubic crystals that can be scratched by a knife but not by a nickel
SIZE: crystals are typically thumbnail-sized, but rarely grow to fist-sized or larger; masses may be up to a foot
COLOR: yellow to brown, purple, colorless; rarely blue
NOTES: The upper Midwest is known for its world-class fluorite specimens, particularly those from southern Illinois, which grace museum collections all over the globe. Fluorite, the most abundant fluorine-bearing mineral, is a relatively common occurrence in the type of limestone formation that is prevalent in the region, and it is popular among collectors, thanks to its often vivid yellow-to-purple color and charming cubic crystals. Crystals are typically intergrown with each other, sometimes forming beautiful complex clusters of cubes, and they often occur with numerous other minerals including calcite, galena, chalcopyrite, sphalerite, and even bitumen.

Galena

HARDNESS: 2.5
STREAK: lead-gray
ENVIRONMENT: mines, quarries
WHAT TO LOOK FOR: very soft, dark, metallic material that is very heavy; often exhibits a markedly blocky structure
SIZE: most pieces of galena are smaller than your palm
COLOR: dark lead-gray, sometimes with a white to tan coating
NOTES: Galena is the primary ore of lead and played a major role in the mining history of Illinois. It consists of a simple combination of lead and sulfur and formed within the region's limestone as the rock underwent chemical changes. Usually darkly colored and metallic, it is brightly lustrous when broken or freshly exposed, but many weathered specimens are coated in a dull white or tan crust of other lead-bearing minerals. Often found within cavities in limestone alongside calcite or fluorite, crystals take the form of perfect cubes, or blocky clusters and masses with step-like features. Veins are also common and may not exhibit crystal structure, but even these specimens are easy to identify as galena is very soft and has a high specific gravity, meaning even small specimens feel heavy for their size. Despite its lead content, galena is safe to handle, but don't inhale its dust.

Gypsum

HARDNESS: 2
STREAK: white
ENVIRONMENT: mines, outcrops
WHAT TO LOOK FOR: very soft, light-colored masses or glass angular crystals that are easily scratched by a fingernail
SIZE: crystals may be up to palm-sized; masses may be up to several feet in size
COLOR: colorless to white or gray, often stained yellow to orange or brown
NOTES: Used for centuries as the primary ingredient in plaster, gypsum is one of the most abundant sulfur-bearing minerals on earth and can form in a number of different ways. In our area, gypsum developed when ancient seas evaporated and left minerals behind. Large beds of massive gypsum are present in the region and are found between layers of sedimentary rocks such as shale. Such massive deposits of gypsum are typically opaque, chalky, and granular in texture. Selenite, the name given to crystallized, translucent gypsum, is far more collectible, and it can be found as glassy sheets, blocky angular crystals, fibrous masses, or delicate needles; selenite often formed when marcasite and other sulfur-bearing minerals weathered, which freed their sulfur content.

Limonite

HARDNESS: ~4-5.5
STREAK: yellowish brown
ENVIRONMENT: quarries, outcrops, road cuts, fields, mines
WHAT TO LOOK FOR: chalky, grainy yellow-brown crusts on rock, or irregular masses with no discernible crystal structure
SIZE: masses of limonite can measure up to several inches in size
COLOR: yellow to brown and orange to rust colors are common; rarely metallic brown to black
NOTES: "Limonite" is not technically a mineral; instead it is a general term used to describe granular mixtures of various water-bearing iron minerals, especially goethite. It forms as a result of iron-bearing minerals weathering and eroding, and is therefore most often found as a chalky, dusty coating or stain on the surface of other minerals, particularly sulfur-bearing iron minerals like pyrite. It can also be found in almost any type of rock, and it is especially common as a stain on porous rocks like sandstone. Masses large enough to collect are uncommon. Limonite is so prevalent that it can be assumed present in any rock, sand, or soil with an orange-brown coloration or stain.

Marcasite

HARDNESS: 6-6.5
STREAK: dark gray to black
ENVIRONMENT: quarries, road cuts, outcrops, mines
WHAT TO LOOK FOR: a hard, brassy metallic mineral formed as plate-like crystals, often with deeply striated (grooved) faces
SIZE: individual crystals are rarely larger than an inch, but crystal clusters or massive specimens may measure several inches
COLOR: pale brass-yellow to grayish yellow common, also metallic brown, or with a reddish or multicolored surface coating
NOTES: Marcasite consists of iron sulfide, a chemical compound made up of iron and sulfur. Pyrite also consists of iron sulfide, but the two minerals differ because their crystal structures formed under varying conditions. And since their brassy colors are quite similar, you'll have to recognize their shapes to tell them apart. While pyrite's typical shape is cubic or octahedral, marcasite forms elongated, tabular (broad) plates that are generally deeply striated (grooved) and frequently grow in clusters. Often, two or more marcasite crystals are twinned (grown within each other), and they form rectangular, hexagonal, or even serration-like shapes.

Pyrite

HARDNESS: 6-6.5
STREAK: greenish gray
ENVIRONMENT: outcrops, quarries, mines, fields, road cuts
WHAT TO LOOK FOR: hard, metallic, brassy yellow masses embedded in rock, or cubic crystals with striated (grooved) sides
SIZE: crystals tend to be no larger than an inch, but masses or veins can grow to several inches or more in size
COLOR: brass-yellow to metallic brown
NOTES: Pyrite, one of the world's most common metallic minerals, is a popular collectible in our region, as it is fairly easy to find and identify. Long known as "fool's gold," pyrite is always brassy yellow in color (unless weathered, in which case it can be more brown) and often forms as cubic crystals that are intergrown with each other and have striated (grooved) sides. Pyrite is much harder than gold. Rarer crystal shapes are present in the region, too. Examples include octahedrons and more complex ball-like shapes. Massive or granular varieties are also common in the limestone of the region. The most desirable and unusual variety of pyrite is the peculiar "sun disks" from Sparta, Illinois. Also called "pyrite dollars," these specimens crystallized as flat, circular disk-like masses that formed between layers of shale deep within a coal mine. How they developed is still something of a mystery, but these unusual specimens are no longer obtainable, if you want to add one to your collection, you must purchase one. No matter the form it takes, pyrite's color and hardness are distinctive.

Quartz

HARDNESS: 7
STREAK: white
ENVIRONMENT: all environments
WHAT TO LOOK FOR: light-colored, translucent, glassy, and very hard six-sided crystals; also found as masses, veins, or river pebbles
SIZE: crystals can be up to several inches; masses can be any size
COLOR: colorless to white when pure; often stained yellow to brown, more rarely purple, dark gray, or reddish
NOTES: Quartz is the most abundant mineral in the earth's crust. It consists entirely of silica, the silicon-and oxygen-bearing compound that helps form hundreds of other minerals. Most abundant as a component of rocks, it often appears in uninteresting white masses in coarse-grained rocks such as granite or as the microscopic grains that make up chert.

Nonetheless, crystals aren't rare and often appear as elongated hexagonal prisms ending in a point. Crusts or cavity-linings of many tiny intergrown quartz crystals are also common in the region; such crusts are called druzy quartz. White water-worn pebbles and chunky , coarse masses of quartz are found most anywhere, often buried in glacial till (gravel). All quartz is easy to identify, thanks to its distinctive high hardness, translucency, and conchoidal fracture (when struck, circular cracks appear).

Sphalerite

HARDNESS: 3.5-4
STREAK: light brown
ENVIRONMENT: quarries, mines, outcrops
WHAT TO LOOK FOR: lustrous, typically dark-colored crystals with many triangular faces or masses occurring with chalcopyrite
SIZE: crystals are generally smaller than an inch or two; masses can become quite large, up to several inches
COLOR: reddish brown to black, more rarely yellow to greenish
NOTES: Sphalerite is the primary ore of zinc, and it is an extremely important mineral in the region, both economically as well as from a collector's viewpoint. It typically formed in our area within limestone while the limestone itself was forming; as the aragonite shells of aquatic organisms and coral began to convert into masses of calcite (the process by which most the region's limestone developed), impurities including lead and zinc were freed. These impurities then reacted with sulfur that was released from coal and oil and crystallized. For this reason, sphalerite is very commonly found with chalcopyrite as well as galena, with which it could possibly be confused (though galena is much softer). Sphalerite is typically reddish brown to black and may appear nearly metallic and opaque, but broken or thin specimens will show some translucency and bright internal reflections. Crystals are often complex in shape but frequently exhibit triangular faces and points.

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