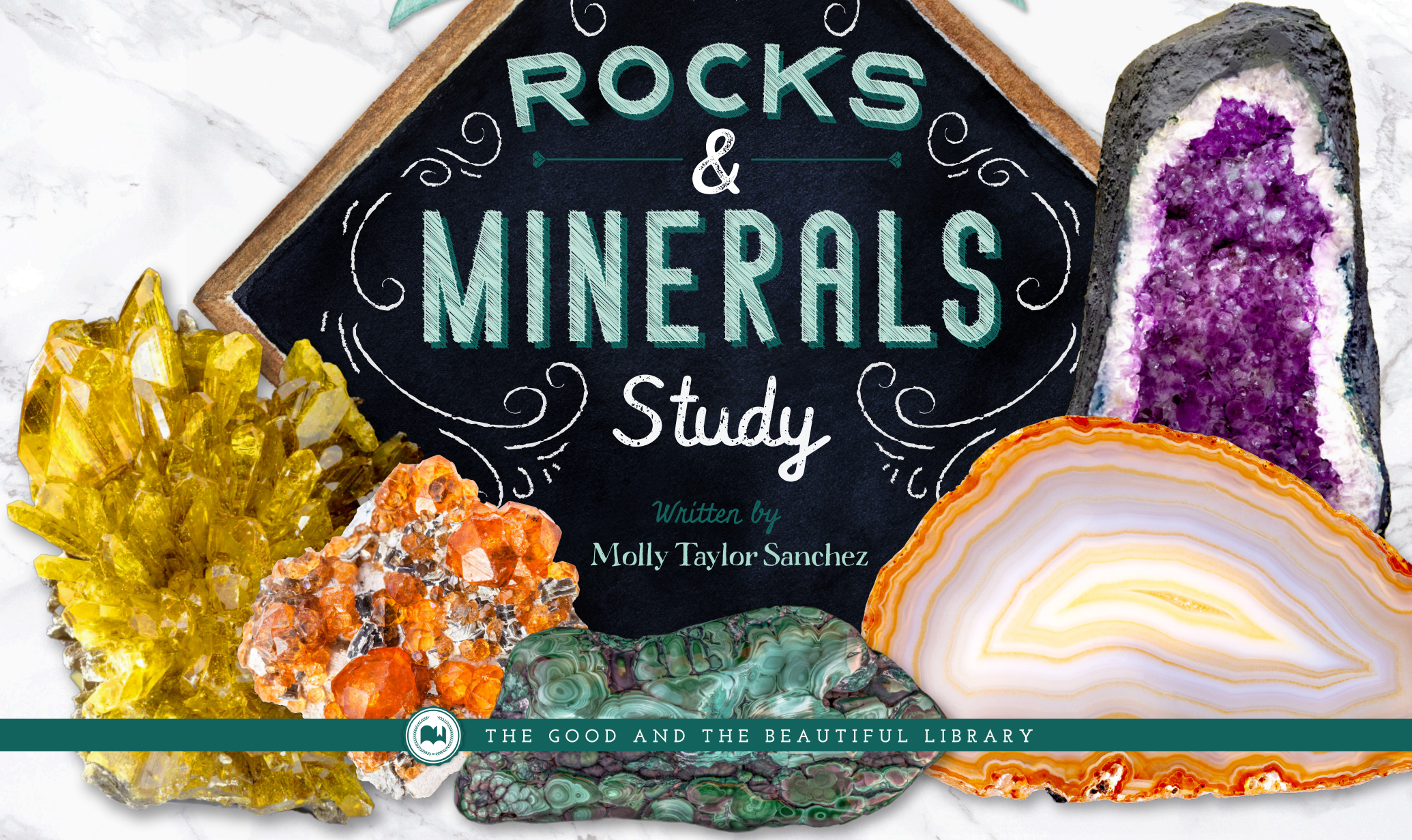
THE GOOD AND THE BEAUTIFUL

ROCKS & MINERALS Study

Written by
Molly Taylor Sanchez



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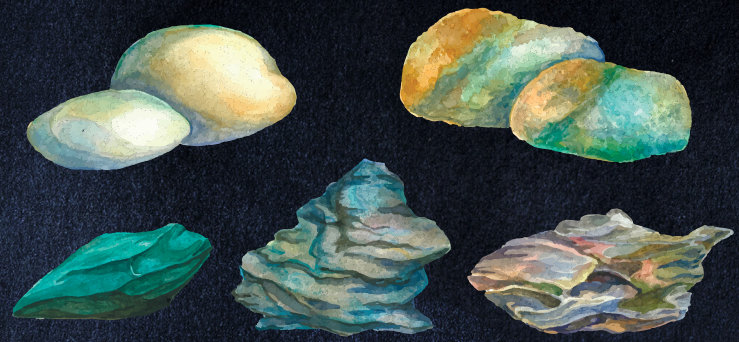
DEFINITIONS

CABOCHON

A stone or gem that has been smoothed and polished, but is not faceted



FACETED

A mineral cut to have many sides, increasing its apparent luster

IRIDESCENT

Creates rainbow-like colors when looked at from different angles

CLARITY

How clear a mineral is or the ability of light to go through it; translucent, transparent, and opaque refer to clarity

MOHS SCALE

Rates the hardness of a rock or mineral

OPAQUE

Light does not pass through it at all

TRANSLUCENT

Light goes through it, but is foggy looking

TRANSPARENT

See-through, like a clean window

Opal

FACTS

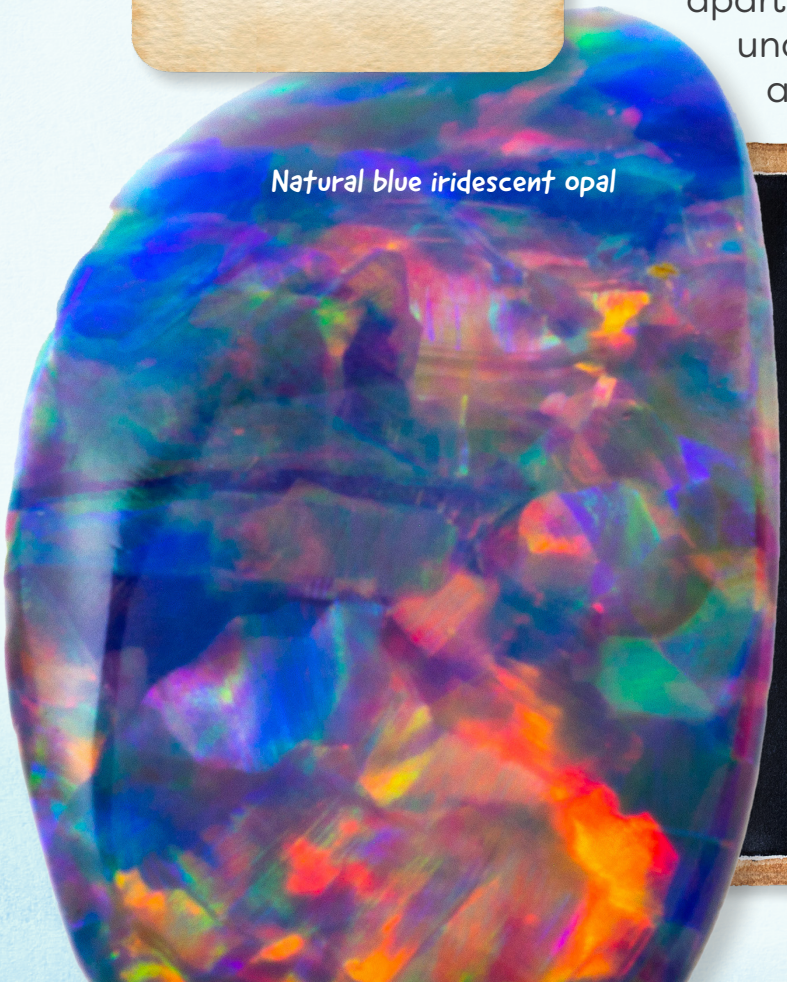
TYPE: Mineraloid

MOHS SCALE: 5.5–6

LUSTER:

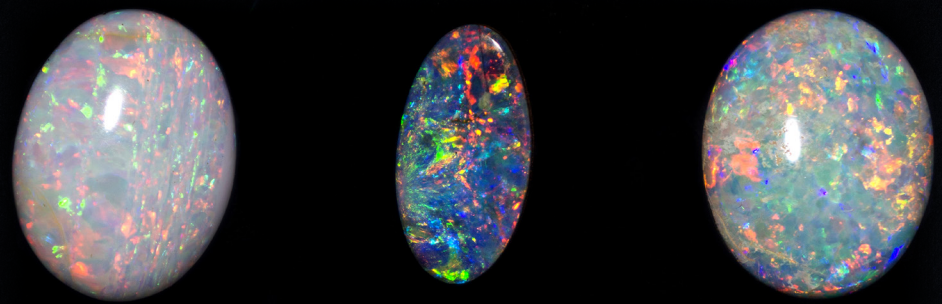
- Subvitreous to waxy

Opals are either precious, common, or synthetic. Precious opals have a play of color in them that common opals don't, meaning you can see reflections of colorful light inside a precious opal. Synthetic opals also have the color, but there is a way to tell them apart: precious opals are fluorescent under a black light, and synthetics are not.



Natural blue iridescent opal

ROCK STUDY



Look at the three stones of precious opal. Gazing into them, doesn't it seem a bit like looking into outer space, with different matter floating around? Count the different colors you see inside the opals.

Pyrite

This lustrous metallic mineral is nicknamed "fool's gold." You can see why! Pyrite is used in a number of modern industries, including jewelry, paper production, and solar panels. It gets its name from the Greek word "pyr," which means fire, because it sparks when struck by metal.

FACTS

TYPE: Mineral

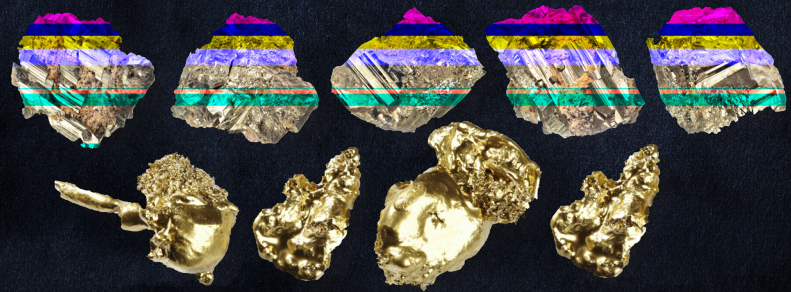
MOHS SCALE: 6–6.5

LUSTER:

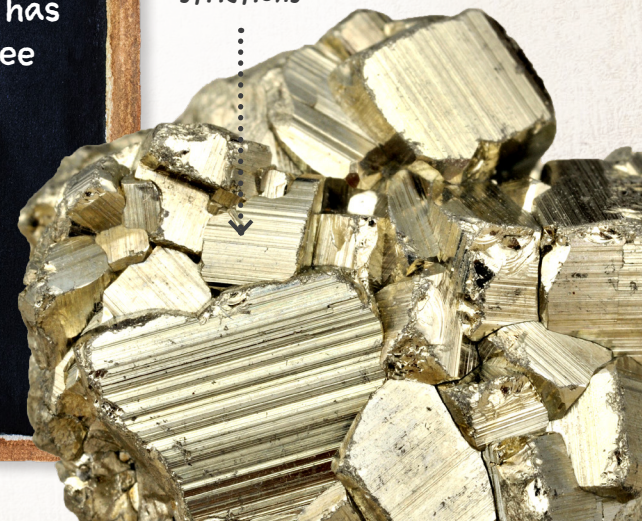
- Metallic

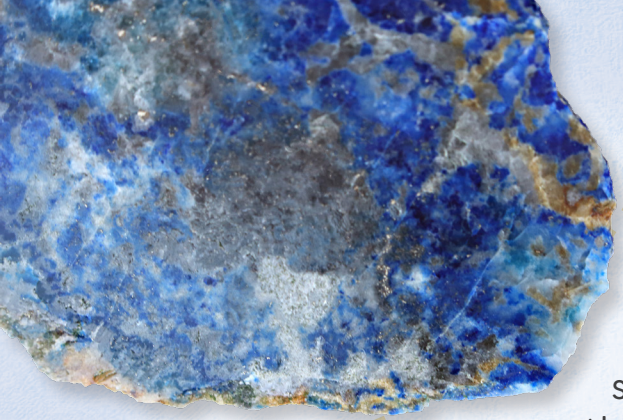
ROCK STUDY

Do you think you could be fooled to think it is gold? Here's how to tell the difference: Pyrite is hard and brittle, and gold is soft and bendable. Pyrite usually forms in cubes or crystals, and gold forms in random shapes. Pyrite often has striations, or visible lines, on it; gold does not. Can you see the difference?



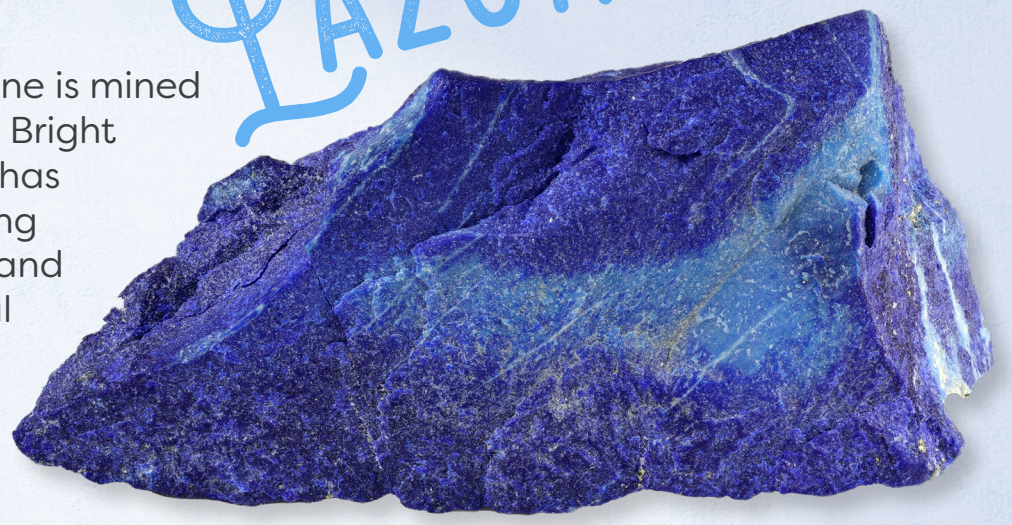
Pyrite striations





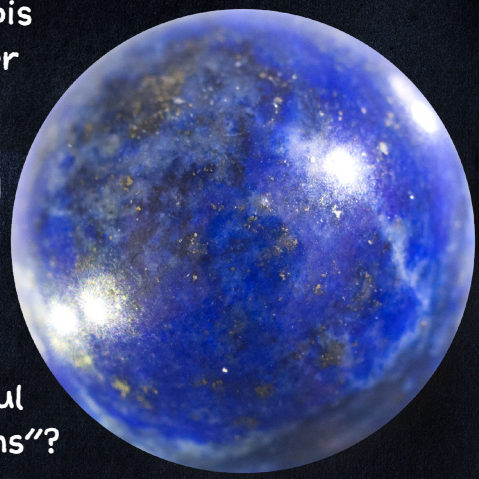
Lazurite

This semi-precious stone is mined mostly in Afghanistan. Bright blue in color, it usually has stripes of minerals running through it, such as pyrite and calcite (which is white). In historical times, it was ground into a powder and added to oil to make paint—an extremely rare and expensive blue paint. The stone is often used to make jewelry.



ROCK STUDY

Doesn't the beautiful round lapis lazuli (lazurite mixed with other minerals) resemble the earth, complete with calcite clouds and pyrite islands? Look closely at all the specimens pictured: the sparkle of the gold pyrite, the darker blue inclusions, the white calcite. Do you think lapis lazuli would be as beautiful without all those "imperfections"?



FACTS

TYPE: Metamorphic

MOHS SCALE: 5–5.5

LUSTER:

- Dull
- Vitreous
- Greasy
- Waxy

JADE

Jade refers to two different minerals that are very similar in hardness and appearance: jadeite and nephrite. Jadeite is slightly harder and more valuable. The more iron present in jade, the deeper the green. Jade can also be found in different colors: white, pink, lavender, and even black. The color depends upon the elements present, such as iron and chromium.

Black Jade

ROCK STUDY

Jade can be quite valuable. The more transparent, translucent, and deep green, the more valuable it is. There are, however, many imitations made from glass or less valuable stones. Real jade is noticeably cold to the touch and quite heavy—more so than glass or even quartz. Imagine what it would feel like to touch the cold and heavy jade.

FACTS

TYPE: Mineral

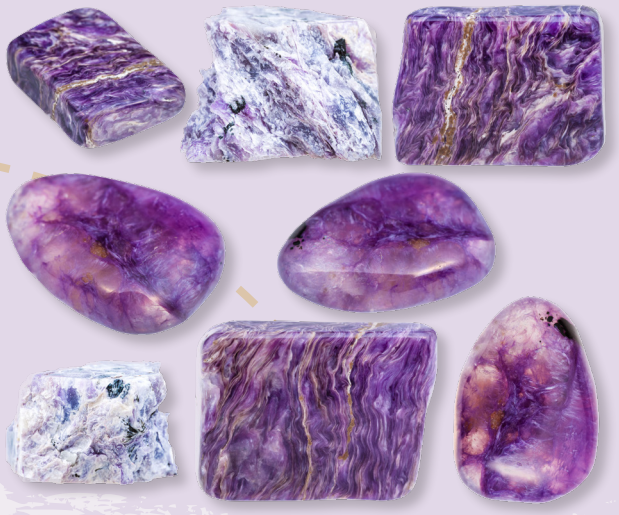
MOHS SCALE: 6.5–7

LUSTER:

- Vitreous

Charoite

This purple stone was first discovered in the 1940s and was called "Lilac Stone." It is now named after the Chara River in Siberia, Russia, which is the only region in which charoite has ever been found. As rare as it is, it can be found in large chunks and is rather inexpensive. You can buy a stone for a couple of dollars.



FACTS

TYPE: Metamorphic

MOHS SCALE: 5–6

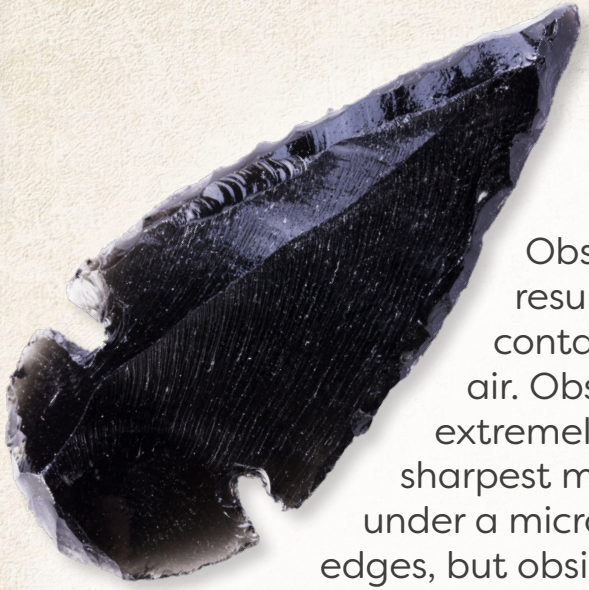
LUSTER:

- Dull
- Pearly
- Vitreous

ROCK STUDY

Charoite has unique swirling patterns due to the inclusion of other minerals and the way its crystals are formed. Sometimes they almost look like pictures of landscapes, oceans, or objects. Find a purple crayon (or multiple shades of purple), as well as 1–2 other colors, and create a swirling pattern of your own on a piece of paper.

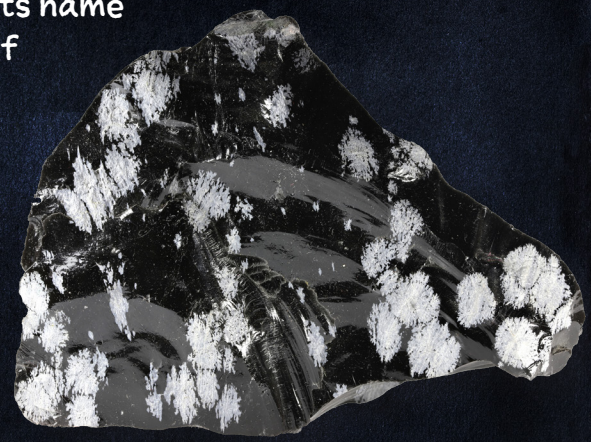
Obsidian



Obsidian is a volcanic glass that is a result of lava cooling quickly from contact with a lake, ocean, or cool air. Obsidian can be made into extremely sharp blades. Even the sharpest metal blade, when viewed under a microscope, has jagged edges, but obsidian remains smooth.

ROCK STUDY

Snowflake obsidian gets its name because of the inclusion of cristobalite crystals that form inside the obsidian, creating a splotchy look. Notice the stark contrast between the black obsidian and white crystals. How many snowflake shapes do you see on the stone?



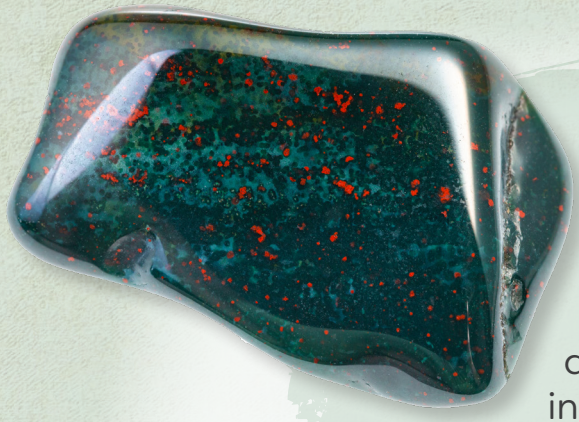
FACTS

TYPE: Igneous

MOHS SCALE: 5–6

LUSTER:
- Vitreous

Bloodstone



Bloodstone (also called heliotrope) gets its name from the flecks of red in the green opaque stone, due to hematite (iron oxide) inclusions. The name hematite comes from the Greek word for blood. Bloodstone has traditionally been used for jewelry, figurines, and small carvings.

ROCK STUDY

Not all bloodstones have the red inclusions of hematite. Look at this picture with eleven bloodstones. How many of them appear to have the red specks? How many do not? Look at the heliotropes with no red inclusions. Notice the difference in color, from light to dark green. Which do you like best?

FACTS

TYPE: Igneous

MOHS SCALE: 6.5–7

LUSTER:

- Vitreous to waxy

Rhodochrosite

The most spectacular rhodochrosites are found in Colorado, ranging from deep red to light pink hues. Because they are relatively soft, they can be difficult to cut, but there are cut stones as large as 60 carats! Most faceted stones, however, are 5 carats or less.

FACTS

TYPE: Mineral

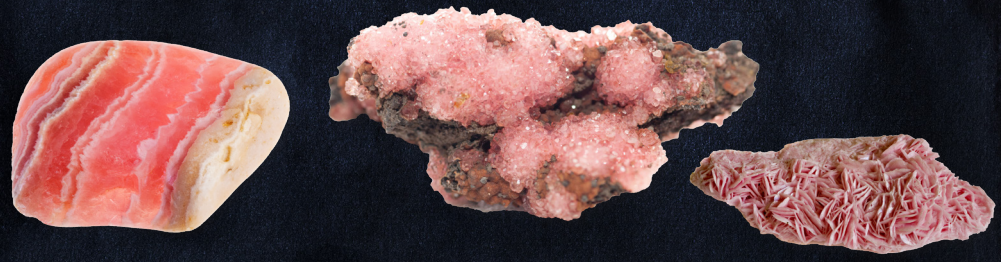
MOHS SCALE: 3.5–4

LUSTER:

- Vitreous
- Pearly

ROCK STUDY

As you compare the photos, notice colors, shapes, patterns, and designs. What similarities do you see between them? What differences do you see? What fruits do they resemble? Which are vitreous? Pearly? Both?



Spessartine Garnet

FACTS

TYPE: Mineral

MOHS SCALE: 7–7.5

LUSTER:

- Vitreous

ROCK STUDY

Have you ever put a strong flashlight behind your hand to watch the front of your hand glow? If you hold the dark reddish spessartine up to the light, the light shines through, making the stone glow orange. How would you put these stones in order from lightest to darkest?

Rare and valuable, spessartine garnets range in color from light mandarin to a deep reddish-orange to brownish and can be found in several countries around the world. The gems are named after the Spessart Mountains in Bavaria, Germany, where they were first found. The rich mandarin colors fetch the highest prices. Violet-red spessartines have been discovered in Colorado and Maine.

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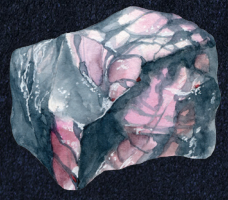
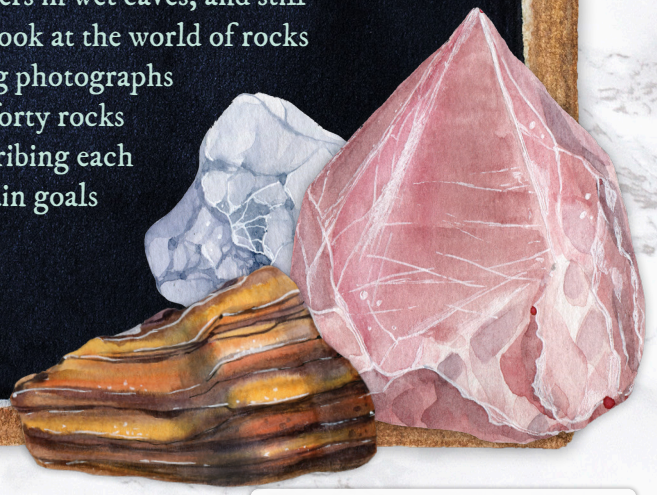


Have you ever held a beautiful stone and wished to know its story—how it was formed, what it is made of, or why it is shaped or colored that way? Some stones grow in volcanic rock, others in wet caves, and still others are formed through intense heat and pressure over thousands of years! Look at the world of rocks and minerals with new eyes through this fascinating book, packed with stunning photographs and images. Children will learn fun facts, as well as the uses and history of the forty rocks and minerals highlighted, while they discover the secret to classifying and describing each one. Helping children glimpse the majesty of the natural world is one of the main goals at The Good and the Beautiful, and this study guide is a perfect place to start!



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THE WORLD BENEATH MY FEET

by Ileana Board

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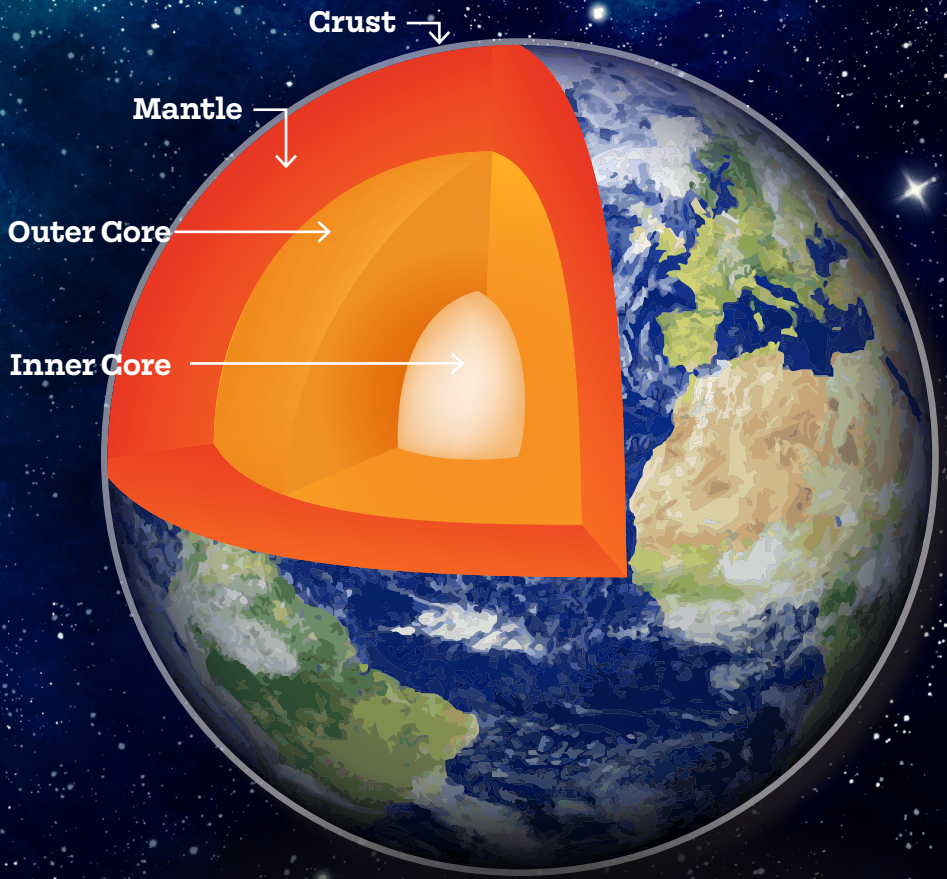
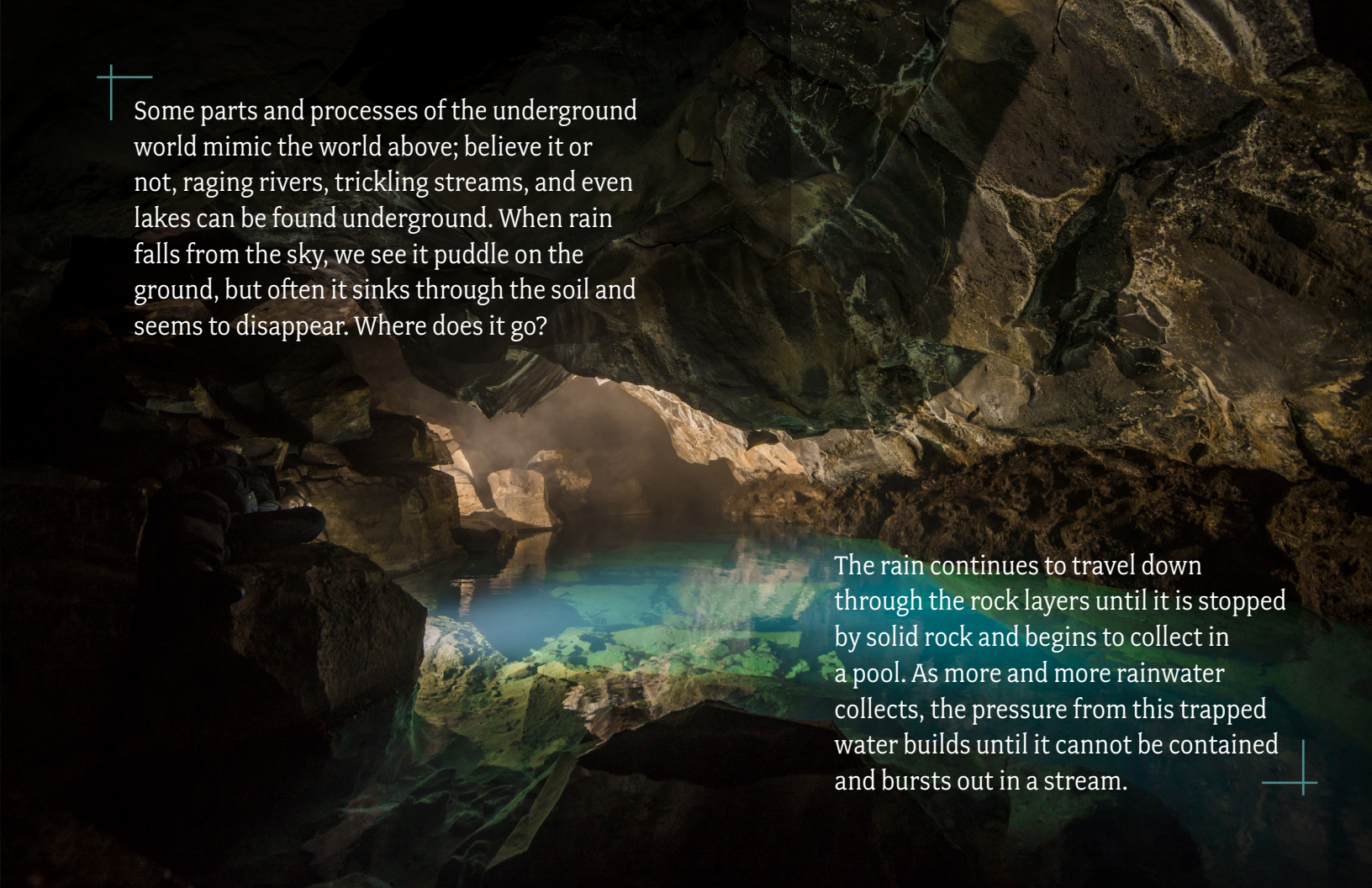
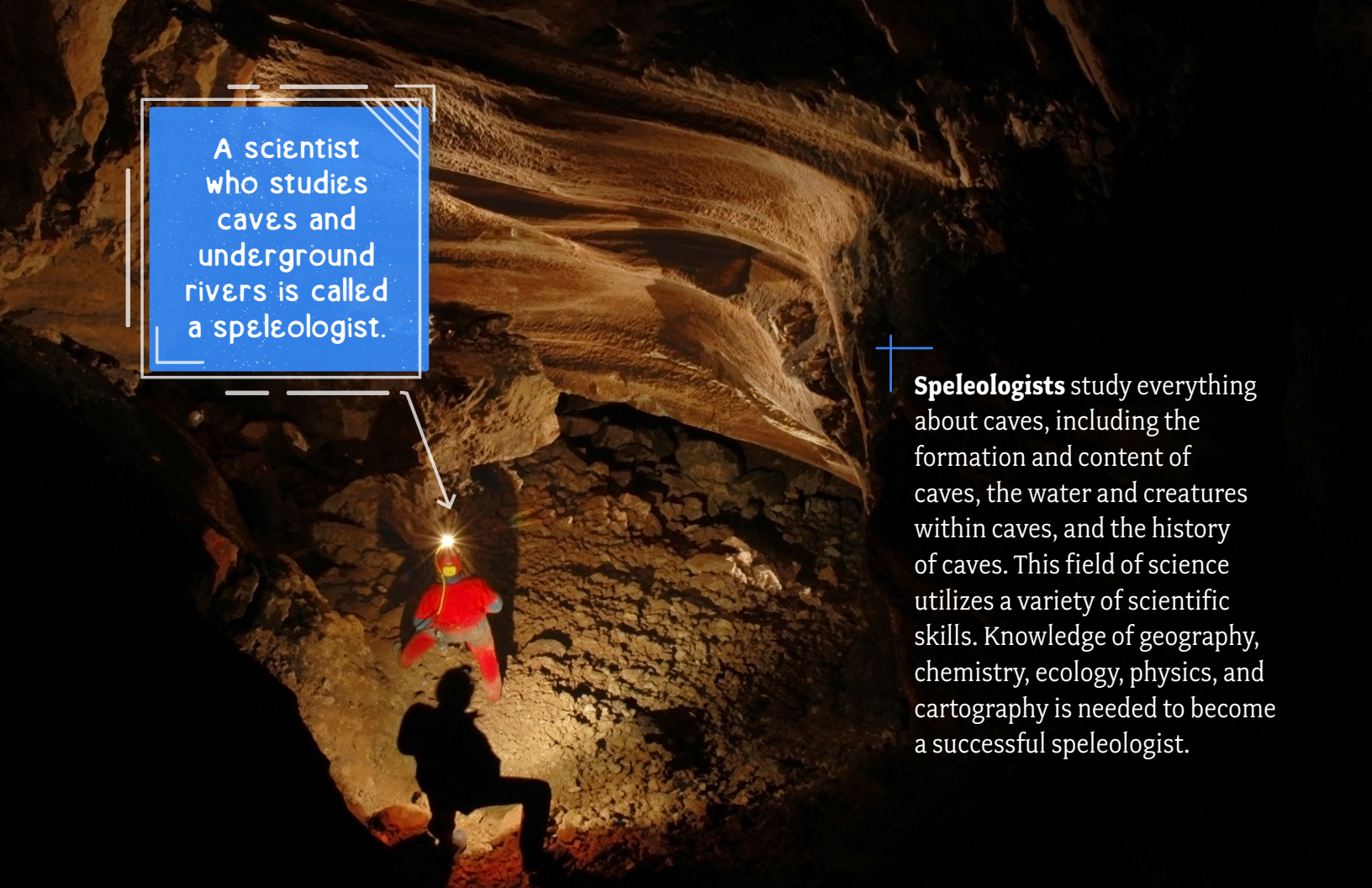
Our planet is made up of four different layers: the crust, the mantle, and the outer and inner cores. Despite the crust being the thinnest of the layers, it is home to all living things on Earth. Even with the inner layers being so relatively close to our feet, we have never seen the mantle or the core layers.





Some parts and processes of the underground world mimic the world above; believe it or not, raging rivers, trickling streams, and even lakes can be found underground. When rain falls from the sky, we see it puddle on the ground, but often it sinks through the soil and seems to disappear. Where does it go?

The rain continues to travel down through the rock layers until it is stopped by solid rock and begins to collect in a pool. As more and more rainwater collects, the pressure from this trapped water builds until it cannot be contained and bursts out in a stream.



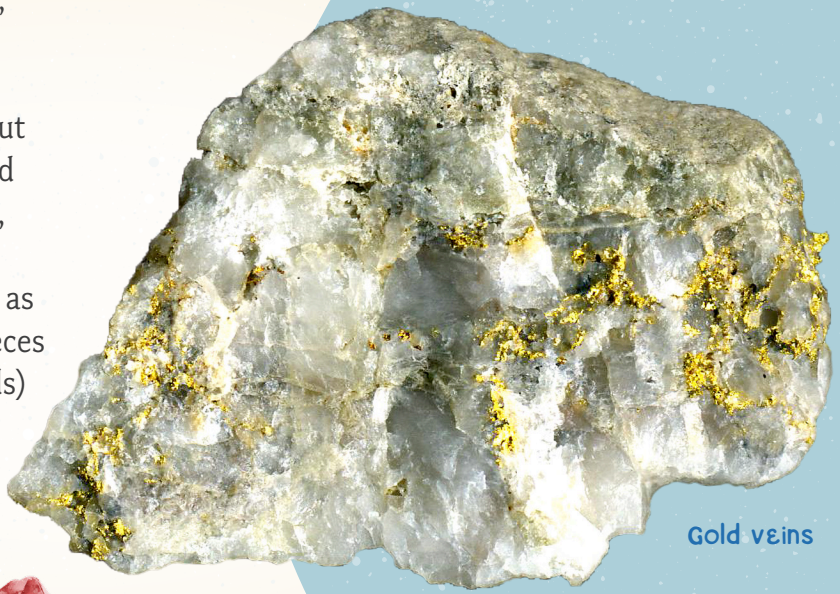
Speleologists study everything about caves, including the formation and content of caves, the water and creatures within caves, and the history of caves. This field of science utilizes a variety of scientific skills. Knowledge of geography, chemistry, ecology, physics, and cartography is needed to become a successful speleologist.

When a volcano erupts above ground, molten rock flows down from the volcano's opening. As it flows and comes in contact with cooler surroundings in crevices underground, the sides and tops of the flow harden, eventually forming a cave-like tube with hot lava still traveling through it.

SCIENTISTS WHO STUDY ROCKS ARE CALLED GEOLOGISTS.

Geologists study the earth, including its history, materials, and processes, in order to help predict what will occur in the future and explain what is happening now.

Gemstones, like diamonds and rubies, are crystallized minerals that form in many different ways, just like the different types of rocks we talked about earlier. The basic requirements needed for crystallization are space, pressure, heat, time, and the right ingredients. Gemstones and precious metals, such as silver and gold, are found as single pieces or in veins (like the veins in your hands) in solid rock.



Gold veins

Today, fossil fuels represent 80% of the world's energy. Because they are impossible to make artificially and take so long to form, these fuels are called nonrenewable energy sources. Every day, scientists are working hard to find other sources of energy. I wonder if any new fuels buried in the world under our feet will be discovered in our lifetimes.

THE WORLD BENEATH MY FEET

Have you ever wondered what it would be like to explore the subterranean realm deep inside the earth? The world mostly concealed from our sight is one of mystery, beauty, and wonder. Come and discover the incredible underground rivers and lakes, lava tubes, rocks, and rare gems that lay within the crust of the earth. Understand the importance of how the substances found below contribute to the wonderful life and advancements we enjoy above. This beautiful book filled with stunning images and incredible facts gives readers a new appreciation for the vast world just beneath our feet.

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