

ROCKS & MINERALS

Activity Book



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Disclaimer: This activity book is intended as entertainment and as a basic introduction to geology. It is not intended as a guide to rock hunting, and it does not guarantee your safety when rock hunting. Neither Lake 7 Creative, LLC, nor Jonah S. Jacobson nor Y. Shane Nitzsche is liable for property loss or damage or personal injury that may result from rock hunting.

What Is Geology?

Geology is a very important branch of science. It is the study of the Earth's natural history and how nature affects rocks and minerals. Geology can be used to help find valuable oil underground, and it can be used to learn whether certain areas of land are safe for people to live on.

One main part of geology is the study of how rocks and minerals form. (See pages 6–7.) Experts can identify specific types of rocks and minerals by using a series of tests. For example, one test involves scratching rocks and minerals with different objects to find out their hardness. (See page 10.)

Another part of geology involves studying natural rock formations. One famous rock formation is the Grand Canyon in Arizona. Using geology, scientists learned that the Grand Canyon was carved some 70 million years ago by the Colorado River (and it is still being carved today). The river's flowing water pounded against the sides of the canyon, causing it to wear down into the mile-deep canyon that is now a national park.

Geologists also study how geysers and volcanoes work. With a geyser, water deep underground becomes so hot that it is forced out of a hole on the Earth's surface. This creates a beautiful stream of water that sprays upward. A famous example of a geyser is Old Faithful in Yellowstone National Park.

Volcanoes work differently. They can be dormant or active. Dormant volcanoes are at rest, so they are not likely to erupt. Active volcanoes are the ones to watch. Magma, or molten (melted) rock, sits in a chamber underground. If enough pressure builds up in the chamber, the volcano erupts. Ash and lava shoot out of the volcano, creating ash clouds and lava rivers. Active volcanoes can be dangerous, so they are monitored. (For more about volcanoes, see page 60.) Geysers and volcanoes are interesting to learn about, but we don't need to worry about them. We'll leave that to the experts.

For most people, geology is about the rocks and minerals—and how they are an important part of our everyday lives. This book is a celebration of them, and you might learn some surprising things about rocks and minerals in the pages ahead.

Have fun, and enjoy!

Author's Note: Many of the rocks, minerals, and other objects in this book can appear in a variety of colors—too many to list in the amount of space. The given colors are not meant to include all variations but rather to provide a few common possibilities.

Rock-Collecting Basics

Rock* collecting is a simple hobby. All you need to do is go outside, find a few rocks, and there you go: you've started your first collection. After that, add rocks that you think look interesting. You don't have to add very often, and the rocks you choose can be as big or as small as you want them to be. Here are five tips to help you get started in rock collecting:

Tip #1: Be careful about where you find rocks. In some places, taking rocks is not allowed. For example, you are not allowed to collect rocks in most state and national parks. You should also never take a rock from someone else's property, unless you have permission. Ask your parent or guardian to help you find good places to hunt for rocks.

Tip #2: Learn to identify the rocks you find. You might want to find out what kinds of rocks are in your collection. To do so, have an adult help you look up your rocks on the internet, or you can use a rock identification book. Either way, discovering this information can be a real thrill.

Tip #3: Get a container for your collection. Once you get started collecting, you can make your own container. If you want to label the types of rocks in your collection, use something like an egg carton, tackle box, or jewelry box. If you don't label your rocks, a shoe box is a great place to store your finds. Display your favorites on a shelf, so others can enjoy them too.

Tip #4: Have your parent or guardian bring you on rock hunts. As long as you keep Tip #1 in mind, you'll find rocks in a lot of different places. Go on a family hike or a walk around the neighborhood. A family trip to the beach is also a wonderful place to look for rocks.

Tip #5: Collect with a friend. Rock collecting is even more fun when it's shared with others. Find a friend who's interested in rocks, and begin your own collections together. That's double the joy!

Rock collecting can be fun for all ages. Remember to stay safe by always hunting for rocks with an adult—and remember to only take rocks from places where it's allowed. With that in mind, good luck on your rock hunting adventures!

*The word "rock" or "rocks" is often used as a general term that stands for all rocks, minerals, fossils, petrified wood, and other geology-related objects.

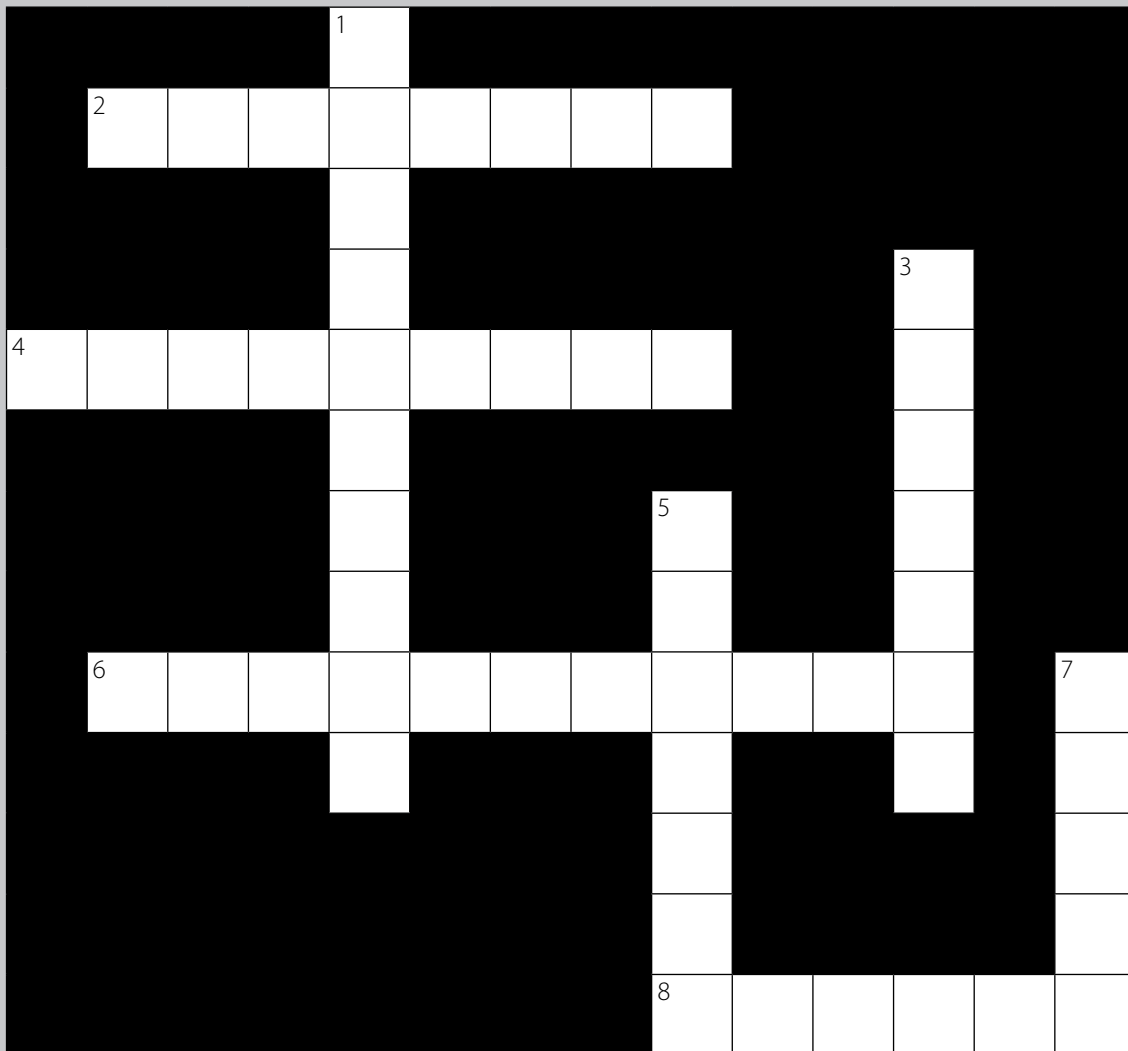
GEOLOGY

Geology is the study of rocks and minerals. It is an important science because it helps to determine how and in what places the Earth's surface moves, as well as how old the planet is. Geologists (experts in geology) have determined that the Earth is about 4.5 billion years old! Geology can also help you identify the rocks and minerals you find.



Geology Crossword

Solve the crossword puzzle below by using information found in this chapter.



Across

2. They are the speckles in rocks
4. Another name for a rock collector (two words)
6. A famous place to see beautiful rock layers (two words)
8. A type of mineral that's made up of a single element

Down

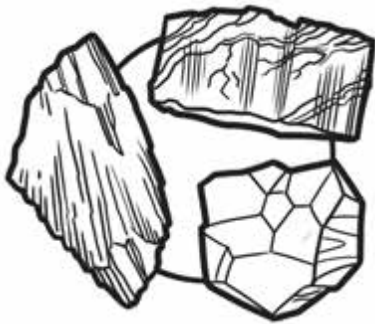
1. This turns rock into sediment
3. It has a hardness score of 10
5. Type of rock formed by cooling magma
7. A rock separation that has a different color than others like it

Types of Rock

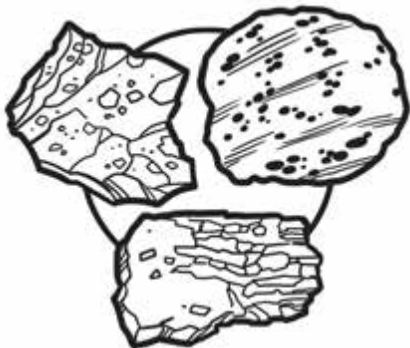
Every rock on Earth falls into three different categories. Each type is formed in its own way, such as collecting in a basin or cooling from a melted state. Each type of rock also has special characteristics, such as containing gas bubbles or having smooth lines and patterns on its sides.



Sedimentary Rock: Sedimentary rocks are made up of sediment—bits of dirt, plant matter, sand, and weathered pieces of other rocks. Sedimentary rocks form when their components gather in some sort of basin, or dip, in the Earth's surface (which is typically filled with water). There, pressure over time hardens the sediment into stone. Limestone, sandstone, and shale are common examples.



Metamorphic Rock: Metamorphic rocks are formed after sedimentary rocks get pushed deep into the Earth. Through tremendous pressure and heat, the sedimentary rocks become entirely different rocks. Metamorphic rocks are harder and smoother than sedimentary rocks. Marble is a metamorphic rock.



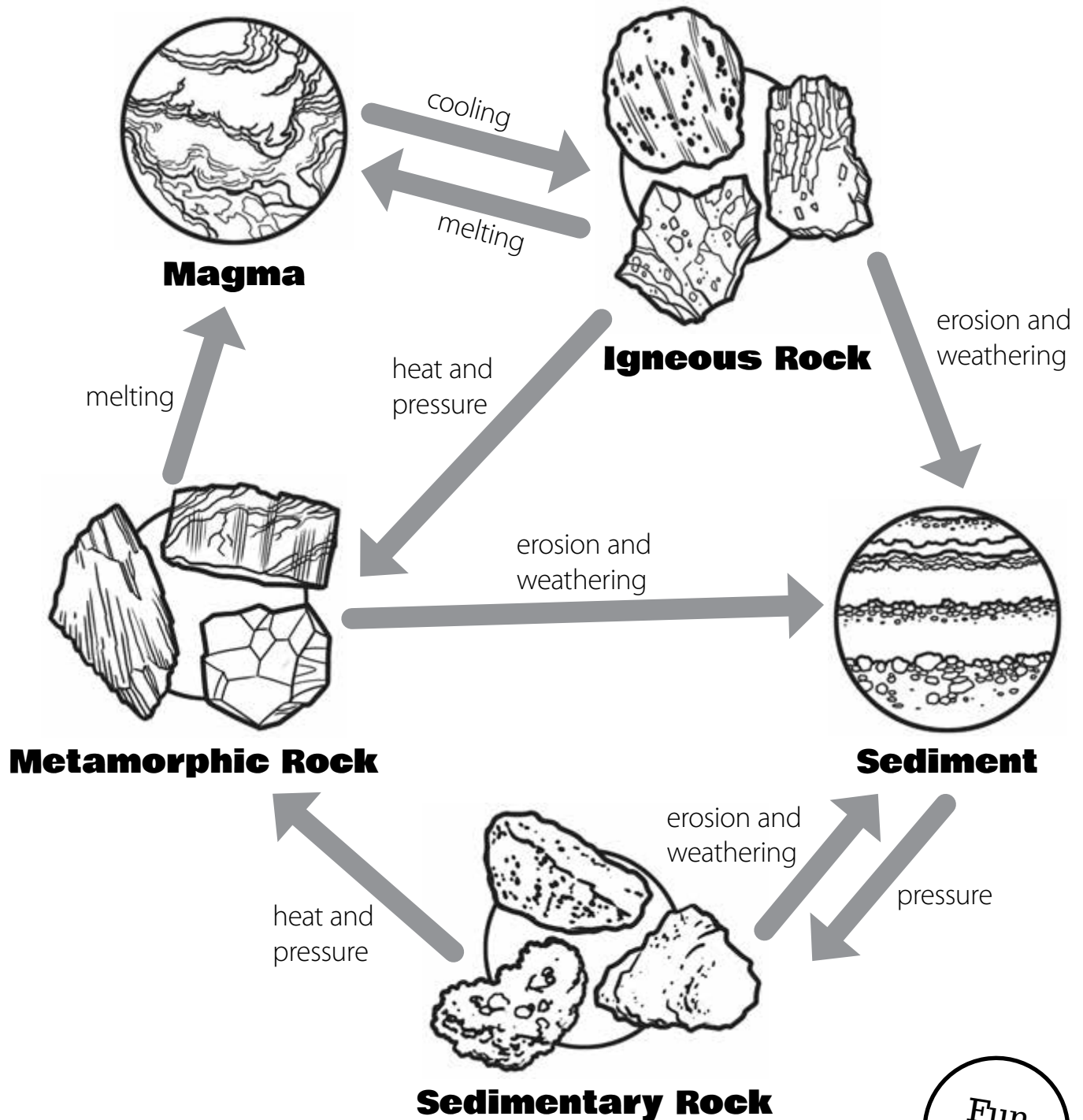
Igneous Rock: Igneous rocks are metamorphic rocks that melted into magma deep underground. They came up through volcanoes and cooled. As they hardened, gas bubbles in the magma became tiny holes in the rocks. When igneous rocks weather, they turn into sediment. Basalt and granite are kinds of igneous rock.

Game
Time!

Study the rock cycle on page 7, and follow the arrows. Can any type of rock eventually turn into the other two types of rock? Circle your answer: YES or NO

Rock Cycle

Rocks form, get destroyed, and form again in an endless rock cycle. This does not happen quickly, though. The cycle can take millions of years. Follow the arrows in the illustration below. It's a great introduction on how the different types of rock fit into the amazing rock cycle!



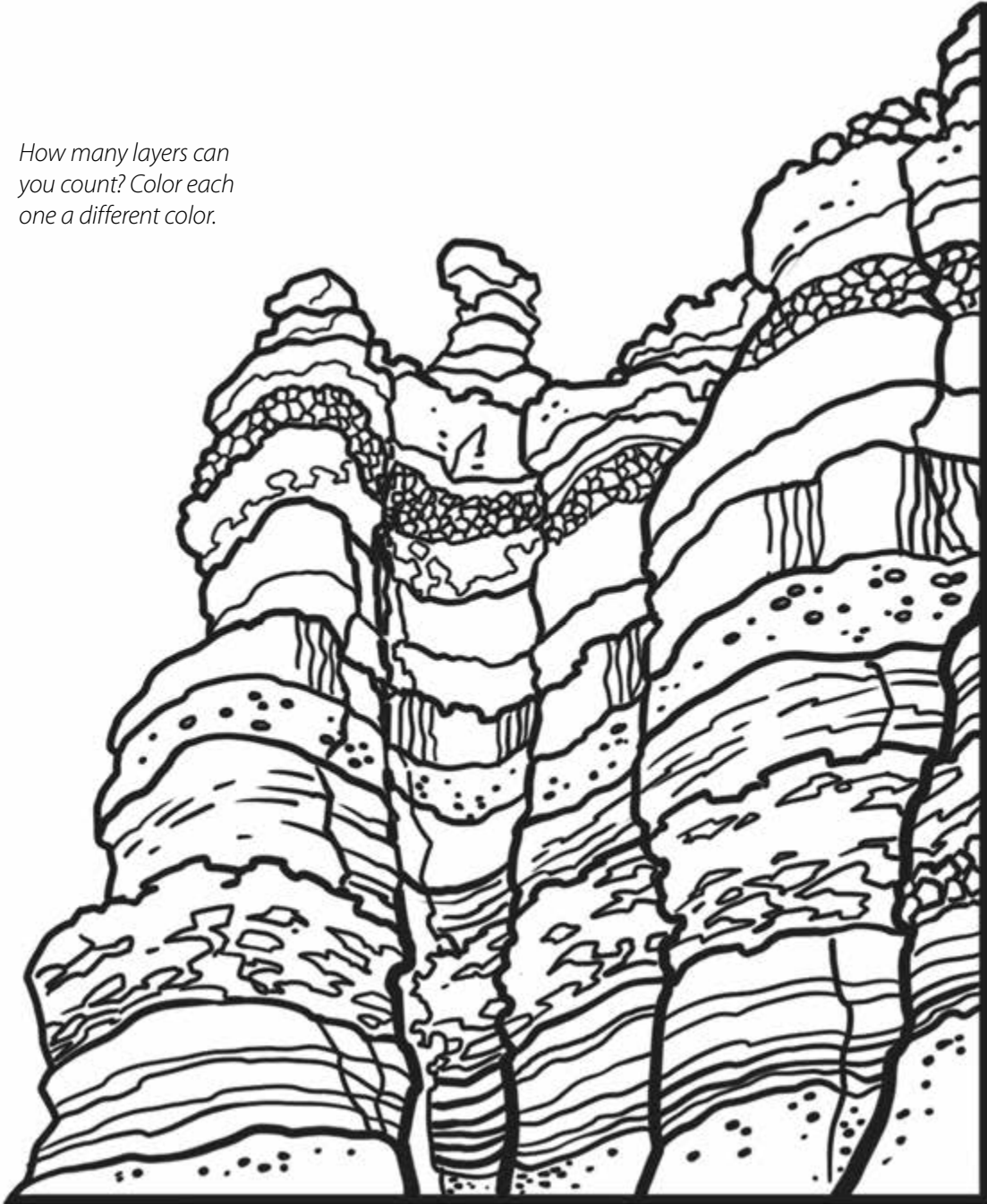
Weathering is the wearing down of rocks and minerals. (See page 61.) Erosion is the removal of soil and rock materials due to natural conditions, such as wind and rainwater.

Fun Fact!

Rock Layers

Over time, rocks form in different layers on top of one another. Older layers of rock are farther down in the Earth. Rock layers have different colors, so you can often tell where one layer starts and another one stops. The different colors are formed by weathering. The colors also show that the type of rock in each layer is different.

How many layers can you count? Color each one a different color.



**Fun
Fact!**

Grand Canyon National Park in Arizona is a popular tourist destination. It's famous for its layered bands of red rock that show millions of years of geological history!

Secret Code

Geology is a science that examines the Earth's structure—especially its rocks and minerals. Use the secret code below to learn a fact about geology that rocks! For example, wherever you see the number 1, write the letter "A" above it. You can also share this code with your friends and send each other secret messages.

$\frac{1}{A}$	$\frac{2}{B}$	$\frac{3}{C}$	$\frac{4}{D}$	$\frac{5}{E}$	$\frac{6}{F}$	$\frac{7}{G}$	$\frac{8}{H}$	$\frac{9}{I}$	$\frac{10}{J}$	$\frac{11}{K}$	$\frac{12}{L}$	$\frac{13}{M}$	$\frac{14}{N}$	$\frac{15}{O}$	$\frac{16}{P}$	$\frac{17}{Q}$	$\frac{18}{R}$	$\frac{19}{S}$	$\frac{20}{T}$	$\frac{21}{U}$	$\frac{22}{V}$	$\frac{23}{W}$	$\frac{24}{X}$	$\frac{25}{Y}$	$\frac{26}{Z}$
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$\frac{25}{A}$ $\frac{15}{B}$ $\frac{21}{C}$ $\frac{13}{D}$ $\frac{1}{E}$ $\frac{25}{F}$ $\frac{2}{G}$ $\frac{5}{H}$ $\frac{8}{I}$ $\frac{15}{J}$ $\frac{12}{K}$ $\frac{4}{L}$ $\frac{9}{M}$ $\frac{14}{N}$ $\frac{7}{O}$

$\frac{1}{P}$ $\frac{13}{Q}$ $\frac{9}{R}$ $\frac{14}{S}$ $\frac{5}{T}$ $\frac{18}{U}$ $\frac{1}{V}$ $\frac{12}{W}$ $\frac{9}{X}$ $\frac{14}{Y}$ $\frac{25}{Z}$ $\frac{15}{A}$ $\frac{21}{B}$ $\frac{18}{C}$

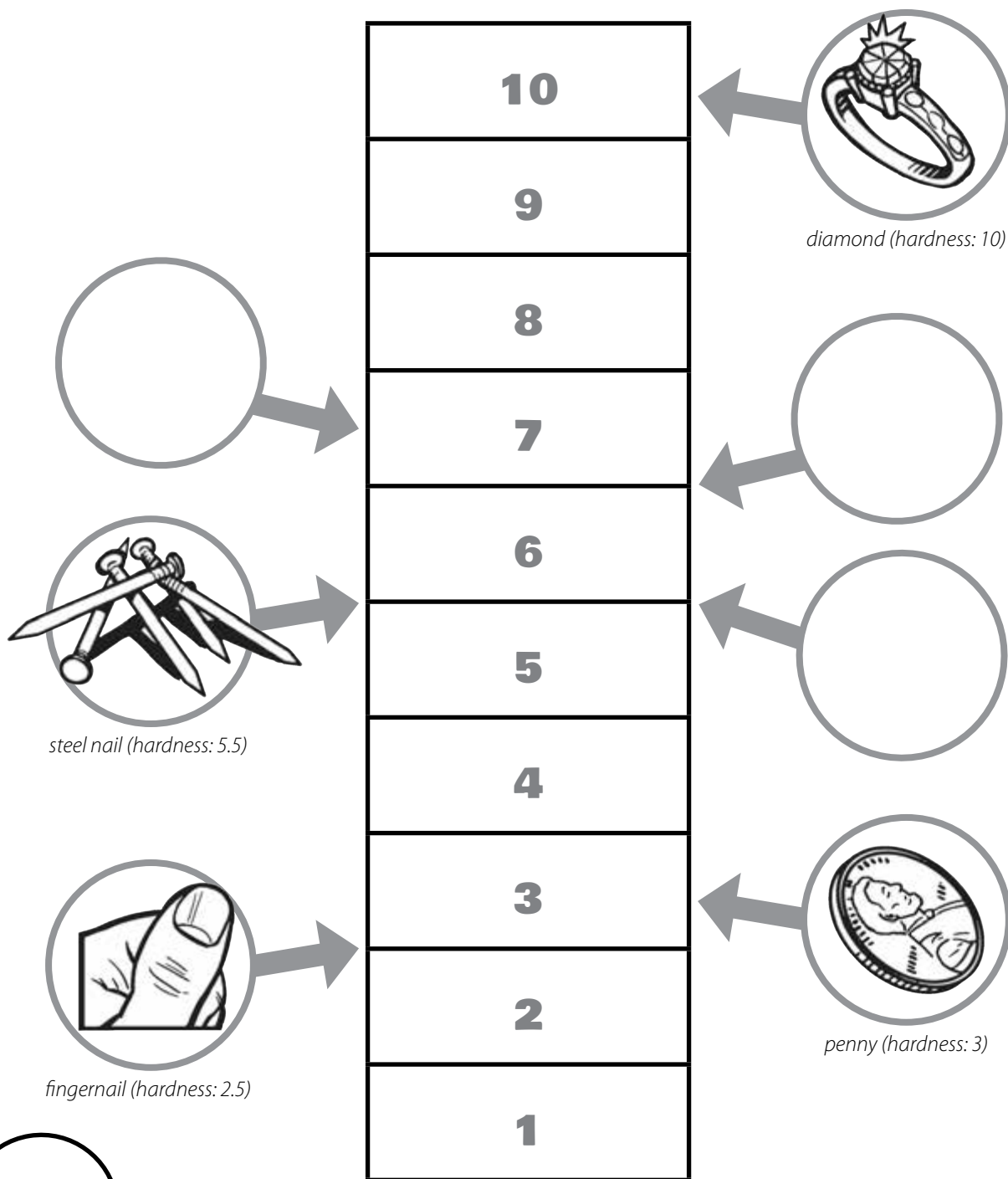
$\frac{8}{D}$ $\frac{1}{E}$ $\frac{14}{F}$ $\frac{4}{G}$ $\frac{18}{H}$ $\frac{9}{I}$ $\frac{7}{J}$ $\frac{8}{K}$ $\frac{20}{L}$ $\frac{14}{M}$ $\frac{15}{N}$ $\frac{23}{O}$:

$\frac{20}{P}$ $\frac{8}{Q}$ $\frac{5}{R}$ $\frac{7}{S}$ $\frac{18}{T}$ $\frac{1}{U}$ $\frac{16}{V}$ $\frac{8}{W}$ $\frac{9}{X}$ $\frac{20}{Y}$ $\frac{5}{Z}$

$\frac{9}{A}$ $\frac{14}{B}$ $\frac{25}{C}$ $\frac{15}{D}$ $\frac{21}{E}$ $\frac{18}{F}$ $\frac{16}{G}$ $\frac{5}{H}$ $\frac{14}{I}$ $\frac{3}{J}$ $\frac{9}{K}$ $\frac{12}{L}$.

Mohs Hardness Scale

The Mohs Hardness Scale is a tool used by geologists to measure the hardness of rocks and minerals. The lowest on the scale is talc. It has a score of 1, making it the softest rock. The hardest material on the scale is diamond, with a rating of 10. The scale was made by Freidrich Mohs in 1812, and it is still used today.



**Game
Time!**

The empty circles point to numbers on the scale. Find a rock or mineral in this book with a hardness score or hardness-score range that matches, and write its name in the circle.

Rock Collecting

Some people view rock collecting as a fun hobby to pass the time. Others are very devoted to filling out their rock collections—even paying thousands of dollars for a rock they need. Rock collections can be big or small and might contain rocks of great or little value. Either way, every rock collection is a lot of fun for its owner.

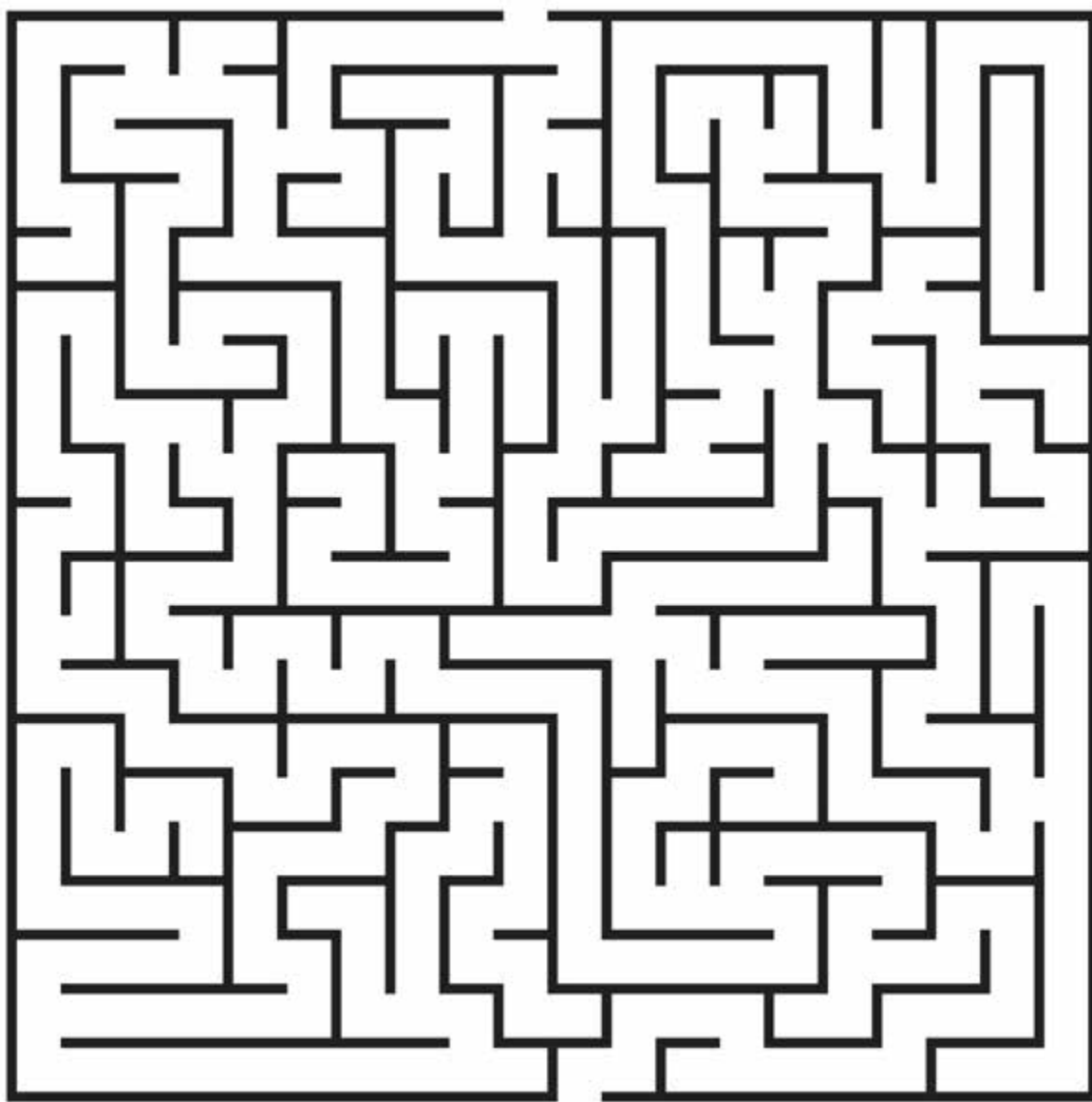


Pretend that you are preparing for a rock hunt by gathering some basic tools. Color the items pictured above. Circle the ones that you would bring on a rock hunt.

**Game
Time!**

Rock Hound

Rock collectors are sometimes called “rock hounds.” This usually means that the collector takes rock collecting very seriously and spends plenty of time (and perhaps money) on the hobby. Help the rock hound below find her way through the maze and to the rock for her collection.

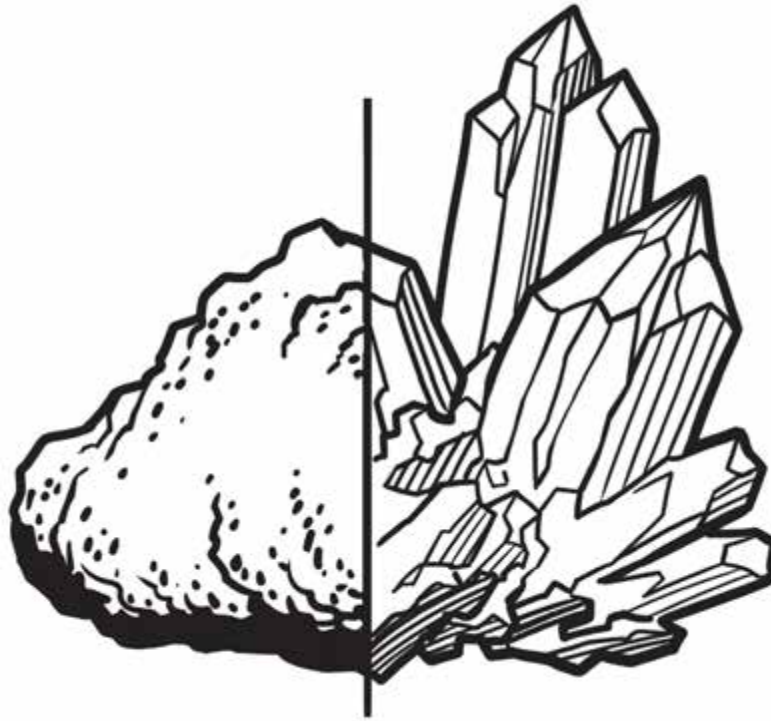


**Fun
Fact!**

Rock collections can be valuable. Some large collections are worth hundreds, even thousands, of dollars. Some rare minerals sell for millions of dollars!

Rock or Mineral?

The Earth is made up of thousands of different minerals. The solid substances can be a single element (such as gold and silver) or a mixture of elements (like quartz). Either way, minerals have the same chemical structure throughout. Rocks are made of a combination of minerals and are not the same throughout.



Which Is Which?

If you find a specimen that looks like a crystal, you can guess it's a mineral.

If you find a specimen that sparkles and shines, you can guess it's a mineral. (But not all minerals are shiny.)

If you find a specimen that looks kind of like glass, metal, or wax, you can guess it's a mineral.

If you find a specimen that's speckled with many different colors, you can guess it's a rock. Each of those colored speckles is a mineral, though.

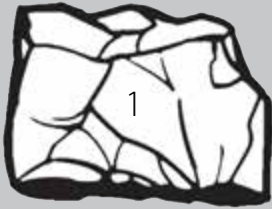
Can you tell which half of the illustration above is a mineral and which is a rock? Draw a circle around the mineral side and a square around the rock side.

An element is a pure substance that's made from just one type of atom. There are only 118 known elements, and everything in the universe is made from them!

**Fun
Fact!**

ROCKS

Rocks are all around us. They are so common that we often don't even notice them. Our streets and sidewalks are made from rock, and so are many houses and buildings. There's even rock beneath the grass that we play on and the water that we swim in. In fact, the entire outer shell of the Earth is made of various kinds of rock. This chapter introduces a few common types of rock and some of their most important uses.



BASALT



CHERT



GRANITE



LIMESTONE



MARBLE



OBSIDIAN



SANDSTONE



SHALE

Eight types of rock are shown in the illustrations above. Although they can appear as a variety of colors, you can use the code below to color them—and learn what they might look like in nature.

1 = black

3 = gray

5 = light yellow

2 = brown

4 = light gray

Answers

Page 5—Geology Crossword

Across: 2. Minerals; 4. Rockhound; 6. Grand Canyon;
8. Silver. Down: 1. Weathering; 3. Diamond; 6. Igneous;
7. Layer

Page 6—Types of Rock

Yes

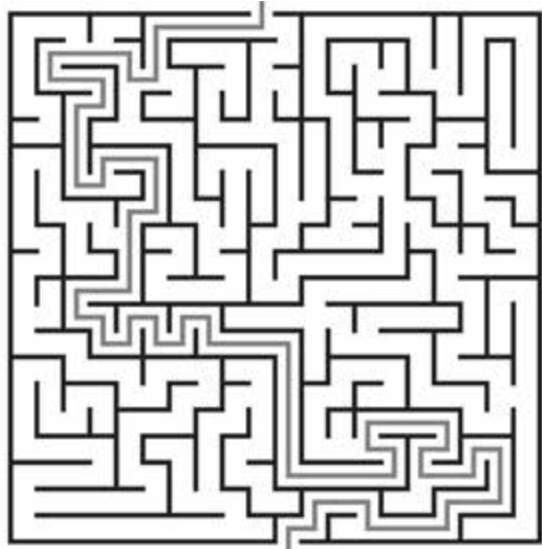
Page 9—Secret Code

You may be holding a mineral in your hand right now:
the graphite in your pencil!

Page 11—Rock Collecting



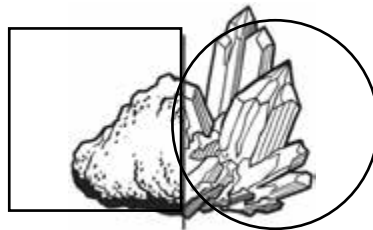
Page 12—Rock Hound



Page 10—Mohs Hardness Scale

5.5: basalt, obsidian, opal, or turquoise. 6.5: granite or
opal. 7: chert, granite, jasper, or quartz.

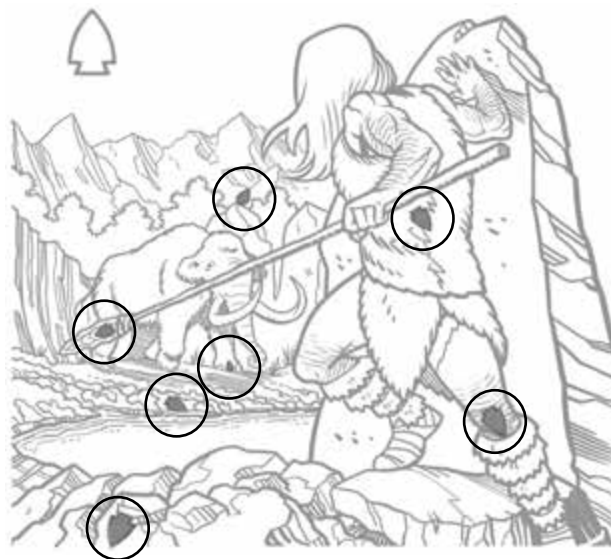
Page 13—Rock or Mineral?



Page 15—Rocks Crossword

Across: 3. Limestone; 5. Brick wall; 7. Hardness;
8. Doctors. Down: 1. Lincoln; 2. Mount Rushmore;
4. Ballast; 6. Flint

Page 17—Chert



Page 27—Minerals Crossword

Across: 2. Fluorescence; 5. Gold; 7. Silver medal;
8. Mines. Down: 1. Turquoise; 3. Crystals; 4. Gemstone;
6. Diamond

Page 34—Iron Ore

Bridge, bus, car, truck, plow, tractor, skyscraper, train,
dishwasher, fork, knife, refrigerator, spoon, stove,
airplane, boat, tank, washer

Answers

Page 22—Sandstone



Page 28—Agate



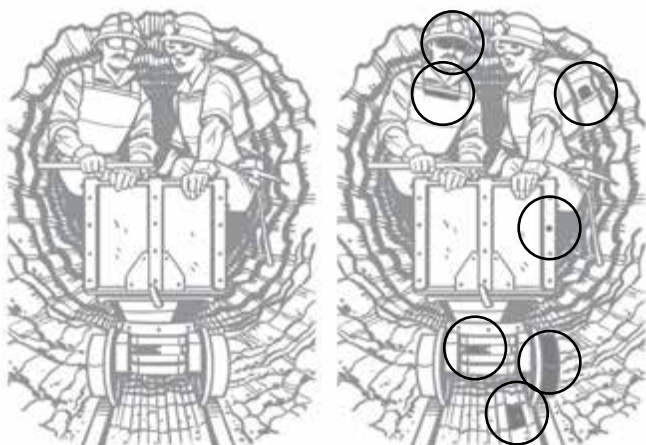
Page 25—More Rocks to Know



Page 32—Gemstones



Page 29—Copper



Page 38—Crystal Healing

Amber: For people who are in pain. Amethyst: For people who are nervous or anxious. Aquamarine: For people who need good luck or protection. Citrine: For people who want to feel better about themselves. Garnet: For people who are tired or sick. Moonstone: For people who have trouble sleeping. Pearl: For people who want to feel happy. Rose Quartz: For people who feel sad or lonely.

Page 41—Match the Crystals

The top left illustration matches the bottom left illustration.

Answers

Page 39—Silver



Page 43—Fossils Crossword

Across: 2. Crystals; 6. Petrified; 7. Meteorites; 8. Minerals. Down: 1. Plant; 3. Thunder egg; 4. Tree resin; 5. Dinosaurs

Page 46—Geode or Thunder Egg?



Page 49—Word Game

1. Volcano; 2. Minerals; 3. Tyrannosaurus rex; 4. Diamonds; 5. Fluorescent; 6. Medicine; 7. Earthquakes; 8. Scientist; 9. Liberty; 10. Permission

Page 51—Crossword Puzzle

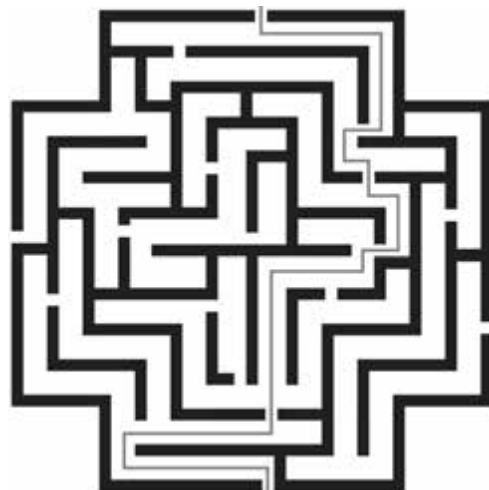
Across: 1. Magma; 4. Canaries; 7. Seismologist; 8. Shopping. Down: 2. Archaeologist; 3. Minnesota; 5. Spelunking; 6. Religion

About the Author: Jonah S. Jacobson has been fascinated with rocks & minerals since he was five years old. A high school student, he spent his 2020 "summer of social distancing" learning more about rock collecting. Jonah is proof that you are never too young to chase your dreams.

Page 52—Archaeologist



Page 59—Rock Shop



Page 61—Weathering



COLOR AND LEARN ABOUT ROCKS, MINERALS, FOSSILS, AND MORE!

The great outdoors is filled with treasures to discover. Rocks, minerals, and even fossils are there to find and enjoy. The *Rocks & Minerals Activity Book* is an amazing educational tool! Your budding rock hound will learn the basics of geology, along with important details about 25 types of specimens, including common rocks like granite, limestone, and shale, and rare minerals like gold, silver, and turquoise. Your family will also appreciate the information about everything from amber and petrified wood to volcanoes and weathering. Coloring pages present facts about each topic. Activities reinforce the information in unique and creative ways.

FEATURES

- Beautiful illustrations to color
- Fun activities for children of all ages
- Fascinating educational details

Packed with useful information in an engaging format, this coloring and activity book truly rocks!



Collect the entire series:

**COLORING
NATURE**



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