

THE SASSAFRAS GUIDE TO GEOLOGY



WRITTEN BY PAIGE HUDSON

THE SASSAFRAS GUIDE TO GEOLOGY

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For more copies write to :
Elemental Science
PO Box 79
Niceville, FL 32588
support@elementalscience.com

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THE SASSAFRAS GUIDE TO GEOLOGY

INTRODUCTION

Our Living Books' method of science instruction was first proposed in *Success in Science: A Manual for Excellence in Science Education*. This approach is centered on living books that are augmented by notebooking and scientific demonstrations. The students read (or are read to) from a science-oriented living book, such as *The Sassafras Science Adventures Volume 5: Geology*. Then, they write about what they have learned and complete a related scientific demonstration or hands-on project. If the time and interest allow, the teacher can add in non-fiction books that coordinate with the topic, or the students can do an additional activity and memorize related information.

The books of the *Sassafras Science Adventures* series are designed to give you the tools you need to employ the Living Books' method of science instruction with your elementary students. For this reason, we have written an activity guide and logbook to correspond with each novel. This particular activity guide contains eighteen chapters of activities, reading assignments, scientific demonstrations, and so much more for studying geology.

Each of the chapters in this guide corresponds directly with the chapters in *The Sassafras Science Adventures Volume 5: Geology*. They are meant to give you the information you need to turn the adventure novel into a full science course for your elementary students. The chapters will provide you with a buffet of options that you can use to teach your students about rocks, maps, and more. So pick and choose what you know you and your students will enjoy!

WHAT EACH CHAPTER CONTAINS

Each chapter begins with a summary of the corresponding chapter in *The Sassafras Science Adventures Volume 5: Geology*. Then, there will be an overview of the supplies you will need for the demonstration, projects, and activities for the chapter. After that, you will find the optional schedules – one for two days a week and one for five days a week. These schedules are included to give you an idea of how your week could be organized, so please feel free to alter them to suit your needs.

After the week-at-a-glance information, you will find the information for the reading, notebooking, and activities for the particular chapter. This information is divided into the following sections:

SCIENCE-ORIENTED BOOKS

① **CHAPTER SUMMARY** – This section contains a paragraph summary of the corresponding chapter in *The Sassafras Science Adventures Volume 5: Geology*.

📖 **ENCYCLOPEDIA READINGS** – This section contains possible reading assignments from:

- 📖 *Basher Science Planet Earth* (best for 1st through 2nd grades)
- 📖 *Basher Science Rocks and Minerals* (best for 1st through 2nd grades)
- 📖 *Usborne Children's Encyclopedia* (best for 2nd through 4th grades)
- 📖 *Discover Science Planet Earth* (best for 2nd through 4th grades)
- 📖 *Discover Science Rocks and Fossils* (best for 2nd through 4th grades)
- 📖 *Kingfisher Science Encyclopedia* (best for grades 4th through 6th grades)

You can choose to read the assignments to the students or have the students read them on their own.

📖 **ADDITIONAL LIVING BOOKS** – This section contains a list of books that coordinate with what is being studied in the chapter. You can check these books out of your local library.

NOTEBOOKING

⇒ **SCIDAT LOGBOOK INFORMATION** – This section has the information that the students could include in their SCIDAT logbook. It contains possible geological information the students could

include on their geology record sheets. The students may or may not have all the same information on their notebooking sheets, which is fine. You want their SCIDAT logbook to be a record of what they have learned. The information included is meant for you to use as a guide as you check their work. For more information about notebooking, please read the following articles:

🔗 What is notebooking? – <http://sassafrasscience.com/what-is-notebooking/>

🔗 How to use notebooking with different ages – <http://sassafrasscience.com/notebooking-with-different-ages/>

- 🔗 **VOCABULARY** – This section includes vocabulary words that coordinate with each chapter. If your students are older, I recommend that you have them create a glossary of terms using a blank sheet of lined paper or the glossary sheets provided in *The Official Sassafras Student SCIDAT Logbook: Geology Edition*. You can also have them memorize these words and their definitions.

SCIENTIFIC DEMONSTRATIONS OR OBSERVATIONS

- ☑ **SCIENTIFIC DEMONSTRATION** – This section includes a list of materials, the instructions, and an explanation for a scientific demonstration that coordinates with the chapter. A blank lab report sheet is provided for you in the Appendix on pp. 117-118 if you wish your students to write up the demonstration. If your students are in fourth grade or higher, I recommend that they complete at least one of these lab reports for this course.

MULTI-WEEK PROJECTS OR ACTIVITIES

- ✂ **ADDITIONAL ACTIVITIES** – This section contains additional activities that go along with the chapter. There are multi-week projects, which will be done over several chapters, and activities that coordinate with that specific chapter. Pick and choose the activities that interest you and your students.

MEMORIZATION

- 🔗 **COPYWORK AND DICTATION** – This section contains a short copywork passage and a longer dictation passage for you to use. Some students may use the shorter passages for dictation or the longer passages for copywork. Feel free to tailor the selections to your students' abilities. You can also use the selections as memory work assignments for the students.

ADDITIONAL MATERIALS

The back of this guide contains a few additional materials for your convenience. The first is a glossary of terms, which you can use with your students as they define the words for each chapter. After that, you will find a set of eight simple quizzes that you can use with your students to verify if your students are retaining the material.

A WORD ABOUT THE SCIDAT LOGBOOK

The SCIDAT logbook is meant to be a record of your students' journey through their study of geology. It is explained in more detail in Chapter 1 of this guide. You can choose to make your own or purchase a pre-made logbook from Elemental Science. *The Official Sassafras SCIDAT Logbook: Geology Edition* has all the pages the students will need to create their own logbooks. Each one has been attractively illustrated for you so that you don't have to track down pictures for the students to use. This way, the students are able to focus on the information they are learning.

FINAL THOUGHTS

As the author and publisher of this curriculum, I encourage you to contact me at support@elementalscience.com with any questions or problems that you might have concerning *The Sassafras Guide to Geology*. I will be more than happy to answer them as soon as I am able. I hope that you and your students enjoy your journey through the world of geology with the Sassafras twins.

BOOK LIST

MAIN TEXT

The following book is required reading for the activities suggested in this guide.

① *The Sassafras Science Adventures Volume 5: Geology*

ENCYCLOPEDIA READINGS

The following encyclopedias have suggested pages scheduled in this guide. I recommend that you choose the one that best suits the age and ability of your students.

- 🔍 *Basher Science Planet Earth* (best for 1st through 2nd grades as a read aloud)
- 🔍 *Basher Science Rocks and Minerals* (best for 1st through 2nd grades as a read aloud)
- 🔍 *Usborne Children's Encyclopedia* (best for 1st through 2nd grades as a read aloud)
- 🔍 *Discover Science Planet Earth* (best for 2nd through 4th grades)
- 🔍 *Discover Science Rocks and Fossils* (best for 2nd through 4th grades)
- 🔍 *Kingfisher Science Encyclopedia* (best for grades 4th through 6th grades)

RECOMMENDED RESOURCES

The following book will be very beneficial to have when completing this course. It contains all the pages and pictures your students will need to record their journey through geology.

🔖 *The Official Sassafras Student SCIDAT Logbook: Geology Edition*

View all the links mentioned in this guide in one place and get a digital copy of the templates, glossary, and quizzes by visiting the following page:

🔗 <http://sassafrasscience.com/volume-5-links/>

ADDITIONAL LIVING BOOKS LISTED BY CHAPTER

CHAPTER 1

- 📖 *Let's Go Rock Collecting* (Let's Read-And-Find-Out Science) by Roma Gans and Holly Keller
- 📖 *Compass* (First Step Nonfiction) by Sheila Rivera
- 📖 *Become an Explorer: Make and Use a Compass* (Adventure Guides) by Dana Meachen Rau

CHAPTER 2

- 📖 *The Seven Continents (Rookie Read-About Geography)* by Wil Mara
- 📖 *Continents in My World* by Ella Cane and Gail Saunders-Smith
- 📖 *Explore South America (Explore the Continents)* by Molly Aloian and Bobbie Kalman
- 📖 *Planet Earth/Inside Out* by Gail Gibbons
- 📖 *The Magic School Bus Inside the Earth (Magic School Bus)* by Joanna Cole and Bruce Degen
- 📖 *See Inside Planet Earth (Usborne Flap Book)* by Katie Daynes and Peter Allen

CHAPTER 3

- 📖 *National Geographic Readers: Volcanoes* by Anne Schreiber
- 📖 *Volcanoes (Let's-Read-and-Find... Science 2)* by Franklyn M. Branley and Megan Lloyd
- 📖 *The Magic School Bus Blows Its Top: A Book About Volcanoes* by Gail Herman and Bob Ostrom

MICROSCOPE INFORMATION

In this activity guide, I have suggested several microscope activities. These are optional, and they are best utilized with older students. For the microscope work, I have done my best to include links to view the subjects online, whenever possible, so that purchasing a microscope is not absolutely necessary for this course. However, I have shared the information below, about purchasing and using a microscope, for your convenience.

MICROSCOPE INFORMATION

If you do not already own a microscope and you have the funds to get one, I suggest purchasing one for this course. You can purchase a good quality microscope at:

- Lab Essentials, Inc. (www.labessentials.com);
- Children's Microscopes (www.childrensmicroscopes.com/022a000m.html);
- Home School Science Tools (www.hometrainingtools.com).

When purchasing a microscope, you are looking for the following things:

- A compound monocular microscope;
- A microscope with 4x, 10x, and 40x objective lenses at a minimum (NOTE – *The eyepiece should also give 10x magnification, which then will allow you to look at an object at 40x, 100x, and 400x magnification.*);
- A microscope with separate coarse and fine adjustment knobs;
- A good light source. (NOTE – *The best light source is a LED or fluorescent bulb. Do not get one with mirror illumination.*)

If you don't know how to use a microscope, see this website for directions:

🔗 <http://www.microscope-microscope.org/basic/how-to-use-a-microscope.htm>

For most of the microscope assignments in this guide, you will be viewing rocks. The best way to do this is by using a collection dish. Check out the following post for more tips on viewing rocks under the microscope at home:

🔗 <http://sassafrasscience.com/rocks-under-a-microscope-at-home/>

And if you are not sure how to make a microscope slide, the following post will walk you through the process:

🔗 <https://elementalscience.com/blogs/science-activities/how-to-make-a-microscope-slide>

A PALM-SIZED OPTION

Many of the microscope assignments in this guide could also be done with a palm-sized microscope. You won't see quite as much as you can with a full-sized microscope, but this a much less expensive option! Here's a look at what a palm-sized microscope can do:

🔗 <http://sassafrasscience.com/palm-sized-microscope-review/>

If you are not sure which option will work for you, check out the following article for a comparison of the options:

🔗 <https://elementalscience.com/blogs/news/which-type-of-microscope-for-homeschool>

DEMONSTRATION SUPPLIES LISTED BY CHAPTER

CHAPTER 1: OBSERVING THE BACKYARD

No supplies needed

CHAPTER 2: MODEL EARTH

Modeling clay (you will need yellow, orange, red, blue, and green)

Ruler

CHAPTER 3: VOLCANIC EXPLOSION

Aluminum pan

Empty soda bottle with a small opening

Air-dry clay or salt dough

Baking soda

Liquid dish soap

Red and yellow food coloring

White vinegar

CHAPTER 4: MOLTEN ROCK

Several different colors of crayon

An old pot

Wax paper (2 sheets)

Straw

CHAPTER 5: FLOATING ROCKS

Clear jar

Water

Small piece of pumice

CHAPTER 6: GLACIAL MOVEMENT

Can of sweetened condensed milk

Cornstarch

Cereal box

Chocolate chips or nuts

Icing

CHAPTER 7: CHANGING ROCKS

Six different colors of crayon

Old grater

Aluminum foil

Bowl

Hot water

CHAPTER 8: FLAT OR ROUND

Blue balloon (with the continents drawn or printed on it)

Flat map

Pin

CHAPTER 9: SANDY CHANGES

Sandpaper

Bar of soap

Plate

CHAPTER 10: TECTONIC MOVEMENT

Marshmallow creme (or whipping cream)

Graham cracker

Plate

Bowl with about an inch of water

CHAPTER 11: FAUX EMERALDS

Small Rock

Jar with lid

Bowl

Water

Borax

Green food coloring

Sandpaper (optional)

CHAPTER 12: ROCKY LAYERS

Several different colors of crayons

Old grater

Butter knife

Crayon or pencil sharpener

Aluminum foil

CHAPTER 13: DRIPSTONE

2 Cups

Warm water

Yarn (1 and a half feet in length)

Baking soda

2 Washers

Paper clip

Paper towel

CHAPTER 14: SOIL OBSERVATIONS

Soil from your backyard

Magnifying glass

Small trowel

Bowl

CHAPTER 15: DISSOLVING ROCK

Jar

Piece of limestone

White vinegar

CHAPTER 16: FERNY IMPRESSIONS

Air-dry clay

Fern frond

Rolling pin

CHAPTER 17: MOUNTAIN MODEL

Cardboard

Air-dry clay or salt dough

Paint (white, grey, green, and blue)

CHAPTER 18: PLAY GUESS MY ROCK

Guess My Rock game cards

PROJECT AND ACTIVITY SUPPLIES LISTED BY CHAPTER

The projects and activities listed in this guide are optional, so you may not need all of these supplies. However, this list has been provided for your convenience. If you do decide to do these projects, in addition to the items listed each week you will need clear tape, glue, scissors, a variety of paint colors, and a set of markers. You will also need a rock to identify each week for the multi-week project.

CHAPTER 1

No additional supplies needed

CHAPTER 2

*Rice Krispies
Marshmallows
Butter
Icing*

CHAPTER 3

*Paper cup
Crackers (saltines or Ritz™)
Can of CheeseWhiz™*

CHAPTER 4

*Small piece of basalt
Microscope collection dish*

CHAPTER 5

*Whipping cream
Powdered sugar
Bowl
Beater
Cup
Water
Small piece of pumice
Microscope collection dish
Slide*

CHAPTER 6

*Small ball
Pan
Flour
Cocoa powder*

CHAPTER 7

*Small piece of gneiss
Microscope collection dish*

CHAPTER 8

*Salt dough (salt, flour, water)
Map of your home state or country
Paints (optional)
Large piece of cardboard*

CHAPTER 9

*Salt dough maps from previous week
Paints
Markers*

CHAPTER 10

*Aluminum pan
Sand
Small play houses and people*

CHAPTER 11

*Piece of beryl (emerald or aquamarine)
Microscope collection dish
Water bottle
Water
Oil
Blue food coloring
Tape*

CHAPTER 12

*Piece of diamond
Microscope collection dish
Empty butter or yogurt container
Glue
Sand
Small pebbles
Gloves*

CHAPTER 13

No additional supplies needed

CHAPTER 14

*Cup
Chocolate bar
Chocolate pudding
Chocolate cookies
Lump of clay*

CHAPTER 15

*Piece of sandstone
Microscope collection dish
Salt dough
Paints*

CHAPTER 16

Wax

Sponge

Heat source

CHAPTER 17

2 Feathers

Vegetable oil

Water

Dish soap

CHAPTER 18

Poster board

Marker

Pictures of rocks studied

THE SASSAFRAS GUIDE TO THE CHARACTERS FOUND IN VOLUME 5: GEOLOGY

THROUGHOUT THE BOOK*

- ★ **Blaine Sassafras** – The male Sassafras twin, also known as Train by his uncle and Rowboat by a group of southwest truckers.
- ★ **Tracey Sassafras** – The female Sassafras twin, also known as Blaisey by her uncle and Fish Hook by a group of southwest truckers.
- ★ **Uncle Cecil** – The Sassafras twins' talented, eccentric, and messy uncle. He is an inventor and lead vocalist for the Floating Tomatoes.
- ★ **President Lincoln** – Uncle Cecil's lab assistant, who doesn't say much, but without his talent for inventing, these zip-line traveling adventures wouldn't be possible.
- ★ **The Man With No Eyebrows** – The memory-erasing, disappearing cape-wearing, eyebrowless man who has tried just about everything he can think of to stop the twins.
- ★ **Summer Beach** – The sandwich-loving, excitable scientist and dear friend of Uncle Cecil that the twins have come to love over their journey.

(*Note – These characters also appeared in the first four volumes of *The Sassafras Science Adventures* series.)

CECIL'S NEIGHBORHOOD (CHAPTER 1)

- ★ **Mrs. Pascapali** (paz-kah-pah-LEE) – Uncle Cecil's neighbor who hosted Summer during her memory-loss episode.
- ★ **Preston** – The squeaky teenage clerk at the Left-handed Turtle Market and the official birthday boy.

ECUADOR (CHAPTERS 2 & 3)

- ★ **Jase Judson** – The twins' local expert in Ecuador, also known as Brick Kid. He is originally from Australia.
- ★ **Andy Judson** – Jase's older brother, also known as Wombatman.
- ★ **Alicia** – A niece of Arturo Azevedos and proud owner of a shiny pink bicycle.
- ★ **Arturo Azevedos** (a-zuh-VEE-dos) – Alicia's uncle who owns and operates a duck boat shop.
- ★ **José** – A local bike-stealing bully.
- ★ **Andrés and Leoncio** (LEE-ohn-see-oh) – José's cousins.
- ★ **Rona the Baker** – She is a thief that the twins ran into during their time at Dockerty castle on their botany leg.

NORWAY (CHAPTERS 4 & 5)

- ★ **Kami Kimi Waffontaine** – The twin's local expert for their time in Norway. It turns out that this is not one person, but rather a set of twin girls.
- ★ **Vick Waffontaine** – Kami's and Kimi's father.
- ★ **Valerie Waffontaine** – Kami's and Kimi's mother.
- ★ **Mr. Baardson** (BAR-sun) – The rock yard foreman.
- ★ **Chairman Svendsen** (SVEN-sun) – The city council chairman of the town of Geiranger.
- ★ **Mrs. Landvik** (LAN-veek) – The innkeeper at the quaint two-story cottage known as the Ringer House Inn.
- ★ **Tank and Billy** – The two pranksters who livened up the twin's time at Smitty Farms during their zoology leg.

ANTARCTICA (CHAPTERS 6 & 7)

- ★ **Isaac Revvington** – The twin’s local expert in Antarctica. He is also attempting to complete the Three Pole Challenge.
- ★ **Nyles** – Isaac’s golden retriever.
- ★ **Bill Slaymaker** – A veteran visitor to Antarctica who has spent four winter-overs on the ice.
- ★ **Bobby Spears and Beau Burnett** – The two pilots flying the plane to Antarctica.
- ★ **Hawk Talons** – The professional survivalist that the twins first met in earth science.
- ★ **Itsy** – Dr. Veeginburger’s henchman that the twins met during their anatomy leg.

DEATH VALLEY (CHAPTERS 8 & 9)

- ★ **J. P. (Catfish) Carlstan** – The twin’s local expert in Death Valley. He is a truck driver who goes by the handle, Catfish, and knows most of the roads in the area.
- ★ **Sally** – The red-headed clerk at Ringo Quick’s.
- ★ **Roly Mackerel** – Catfish’s younger brother who has disappeared in search of the Vanishing Road.
- ★ **Lil’ Goldfish** – Roly’s son and Catfish’s nephew who is along for the ride.
- ★ **Blue Beard, Pearly Pony, and Lion’s Roar** – Catfish’s truck driving friends.
- ★ **Rama** – The pirate king that the twins first encountered during their botany leg.

SRI LANKA (CHAPTERS 10 & 11)

- ★ **Emeraldine Hendrix** – The twin’s local expert in Sri Lanka who also goes by Emmy and Dean. She is an admired surfer and a knowledgeable scientist.
- ★ **Daryl and Devon** – Emeraldine’s surfing friends who are in search of the legendary Sri Lankan wave.
- ★ **Captain Tharanga** (THAH-ran-gah) – The self-proclaimed “most-feared” captain of the Tectonic Fate.
- ★ **Dr. Pete Pavan** (PAH-vahn) – The man who invited Emeraldine to the island.
- ★ **Kingman Narwarak** (NAH-wah-rr-k) – The Thai kidnapper who was brought to justice during the twin’s anatomy leg.

AUSTRALIA (CHAPTERS 12 & 13)

- ★ **Jack R. Wagon** – The twin’s local expert in Australia also known as Jackie Ray. He is a former roughneck turned ping-pong playing geologist in search of a diamond.
- ★ **Matty Mingo** – One of the Brown Mountain Hermits that Blaine met during their zoology leg. He owns the Mingo Family Mines.
- ★ **Peggy Jo** – The ping-pong champion that Jack once embarrassingly injured.
- ★ **Stanly Pelter III** – The former schoolmate of Jack and Peggy Jo who owns the S.P.III mining company.
- ★ **Itja** (EET-jah) – The scoundrel leader of a group of bandits known as the Kekeway that the twins encountered on their zoology and anatomy legs.



MADAGASCAR (CHAPTERS 14 & 15)

- ★ **Elias Zafy** – The twin’s local expert while they are in Madagascar. He is not the most talkative fellow, but he sure knows his geology.
- ★ **Miora Zafy** – Elias’s older sister.
- ★ **Yuroslav Bogdanovich** – The evil, rogue scientist that the twins have dealt with during their botany and earth science legs.

ALBERTA (CHAPTERS 16 & 17)

- ★ **Margo Blue** – The twin’s local expert in Alberta. She is a paleontologist and part of the BluesTeam in the T-Rex Intrepid Challenge.
- ★ **Clark Blue** – Margo’s husband who is also part of the Blue Team in the T-Rex Intrepid Challenge.
- ★ **Apex** – The captain of the Sparkle Ultra Team in the T-Rex Intrepid Challenge.
- ★ **Zenith, Elite, and Pinnacle** – The other members of the Sparkle Ultra Team in the T-Rex Intrepid Challenge.
- ★ **Farley, Milton, Elvis, and Stacks** – The four members of the BAMA Boys Team the T-Rex Intrepid Challenge.
- ★ **Brooks Hirebro** – Head of “Hirebro” – an adventure sports company that sponsors the T-Rex Intrepid Challenge. He is also the head of Team Adventure Fuel.
- ★ **Tim, Abe, and Josh** – The other members of the Adventure Fuel team. They are also Brooks Hirebro’s brothers.

SIBERIA (CHAPTER 18)

- ★ **Adrianna Archer** – The former Triple S agent that the twins met during their earth science leg.

CHAPTER 1: THE RETURN OF SUMMER

CHAPTER SUMMARY

The chapter opens with the twins nervous to meet Summer for the first time . . . again. Blaine and Tracey recall the events of the last few weeks that led up to the moment. We find out that although Summer’s memories were erased, Uncle Cecil was able to restore them with a canister that contained her memories up to the beginning of summer, meaning that Summer had not yet met the twins. The meeting goes well, and President Lincoln presents his review of earth science for the twins before the group heads out to the Floating Tomatoes concert. Early the next day, the twins get a new compass application for their phones before they set out on their geology leg. As they are zipping away, Tracey remembers something that she discovered as they were looking for Summer’s memory canister. The chapter ends with Tracey attempting to warn Uncle Cecil, but she leaves before she can get the words completely out.

SUPPLIES NEEDED

Demonstration	Projects and Activities
• No Supplies Needed	• No Additional Supplies Needed

OPTIONAL SCHEDULES FOR TWO-DAYS-A-WEEK

Day 1	Day 2
<input type="checkbox"/> Read Chapter 1 in <i>SSA* Volume 5: Geology</i> . <input type="checkbox"/> Set up your students’ SCIDAT logbooks. <input type="checkbox"/> Go over the vocabulary words and enter them into the Geology Glossary on SL** pg. 91. <input type="checkbox"/> Do the demonstration entitled “Observing Your Backyard”; write observations on SL pg. 5.	<input type="checkbox"/> Read the assigned pages from the encyclopedia of your choice; write narration on the Geology Notes Sheet on SL pg. 5. <input type="checkbox"/> Read one of the additional living books from your library; write narration on the Geology Notes Sheet on SL pg. 6. <input type="checkbox"/> Do the copywork or dictation assignment and add it to the Geology Notes sheet on SL pg. 6. <input type="checkbox"/> Play a game of “I Spy.”

OPTIONAL SCHEDULE FOR FIVE-DAYS-A-WEEK

Day 1	Day 2	Day 3	Day 4	Day 5
<input type="checkbox"/> Read the section entitled “Meeting for the first time . . . again” of Chapter 1 in <i>SSA Volume 5: Geology</i> . <input type="checkbox"/> Set up your students’ SCIDAT logbooks. <input type="checkbox"/> Go over the vocabulary words and enter them into the Geology Glossary on SL pg. 91.	<input type="checkbox"/> Read the section entitled “On to Geology” of Chapter 1 in <i>SSA Volume 5: Geology</i> . <input type="checkbox"/> Do the demo*** entitled “Observing Your Backyard”; write observations on SL pg. 5.	<input type="checkbox"/> Choose one of the additional activities to do; write narration on the Geology Notes Sheet on SL pg. 5.	<input type="checkbox"/> Read one of the additional living books from your library; write narration on the Geology Notes Sheet on SL pg. 6.	<input type="checkbox"/> Do the copywork or dictation assignment and add it to the Geology Notes sheet on SL pg. 6. <input type="checkbox"/> Play a game of “I Spy.”

*SSA = *The Sassafras Science Adventures*

**SL = *The Official Sassafras SCIDAT Logbook: Geology Edition*

***demo = demonstration

SCIENCE-ORIENTED BOOKS

LIVING BOOK SPINE

- 📖 Chapter 1 of *The Sassafras Science Adventures Volume 5: Geology*

OPTIONAL ENCYCLOPEDIA READINGS

There are no optional encyclopedia readings this week, but you may want to consider purchasing one of the following Rock Field Guides to use for the remainder of your geology studies.

- 📖 *National Audubon Society Field Guide to Rocks and Minerals: North America*
- 📖 *A Field Guide to Rocks and Minerals (Peterson Field Guide) by Frederick H. Pough and Roger Tory Peterson*
- 📖 *National Geographic Pocket Guide to Rocks and Minerals of North America by Sarah Garlick*



ADDITIONAL LIVING BOOKS

- 📖 *Let's Go Rock Collecting (Let's Read-And-Find-Out Science) by Roma Gans and Holly Keller*
- 📖 *Compass (First Step Nonfiction) by Sheila Rivera*
- 📖 *Become an Explorer: Make and Use a Compass (Adventure Guides) by Dana Meachen Rau*

NOTEBOOKING (SCIDAT LOGBOOK INFORMATION)

This week, you will set up the students' SCIDAT logbooks. You can use blank sheets of copy paper with dividers for each section or purchase *The Official Sassafras Student SCIDAT Logbook: Geology Edition* with all the pages and pictures from Elemental Science. Below is an explanation of each of the student sheets.

CONTINENT SHEETS

The purpose of these sheets is to give the students an opportunity to work on their geography skills as they study the seven continents.

MAP – Have the students color and label the continent on the map.

SIZE AND LOCATION – Have the students add how the size of the continent relates to the other continents, along with the hemisphere the continent can be found.

REGIONS – Have the students enter the the different regions that can be found on the continent.

GEOLOGICAL FEATURES – Have the students enter the major geological features, i.e., mountain ranges, rivers, and so on, that can be found on the continent.

CONTINENT MAP SHEETS

The purpose of these sheets is to give the students an opportunity to work on their mapping skills. You can have them label the map with the bodies of water or land that border the continent, as well as the major rivers. You can also have them draw in any mountain ranges found on the continent and mark where the major geological features are. We have provided these answers for you in subsequent chapters, or you can have the students look the answers up in a world atlas.

GEOLOGY RECORD SHEETS

The purpose of these sheets is for the students to record what they have learned about the various topics that are introduced in *The Sassafras Science Adventures Volume 5: Geology*.

INFORMATION LEARNED – The students should color the picture above the box, if they desire, and enter any information that they have learned about the particular topic.

GEOLOGY SCIENCE NOTES SHEETS

The purpose of these sheets is for the students to record any additional information that they have learned during their study of geology. You can use these sheets to record additional narrations, copywork, or dictation assignments.

PROJECT RECORD SHEETS

The purpose of these sheets is for the students to record the projects they have done during the course of their study of geology.

GEOLOGY GLOSSARY

The purpose of the glossary is for the students to create a dictionary of terms that they have encountered while reading *The Sassafras Science Adventures Volume 5: Geology*. They can look up each term in a science encyclopedia or in the glossary included on pp. 127-128 of this guide. Then, have the students copy each definition onto a blank index card or into their SCIDAT logbooks. They should also illustrate each of the vocabulary words. (NOTE – *In The Official Sassafras Student SCIDAT Logbook: Geology Edition, these pictures are already provided.*) This week, have the students look up the following terms:

📖 GEOGRAPHY – The branch of science that studies the Earth's surface

📖 GEOLOGY – The branch of science that studies the rocks on the Earth's crust.

For each of these sheets, you can have the students enter information only from *The Sassafras Science Adventures Volume 5: Geology*, or you can have them do additional research to gather more facts. What you choose to do will depend on the ages and abilities of your students.

SCIENTIFIC DEMONSTRATION: OBSERVING YOUR BACKYARD

Begin by taking a moment to discuss the different types of biomes you have learned about so far in the Sassafras Science series (i.e., deserts, grasslands, forests, and so on). You can discuss the weather and typical plants found there and then identify which type of biome you live in. You can also discuss how important observation skills are for the scientist who is studying geology. You can view the following blog posts for more information on the subject of observation:

🔗 <http://elementalscience.com/blogs/news/63858627-observation-is-key>

🔗 <http://elementalscience.com/blogs/homeschool-science-tips/71117699-3-ways-to-work-on-observation>

Explain that, today, the students are going to practice their observation skills while finding and observing the soil and rocks you can find in your backyard. Then, take a walk in your backyard, in your neighborhood, or on a nearby nature trail. Allow the students to make observations and ask questions.

Ask the students:

⇒ *Can you see any rocks? What do those rocks look like?*

⇒ *What does the soil look like?*

Allow the students to observe the environment and find clues from there. You can record their answers on the sheet provided in the SCIDAT logbook.

MULTI-WEEK PROJECTS AND ACTIVITIES

MULTI-WEEK PROJECTS

✂️ **ROCK COLLECTION** – Over the weeks of this study, the students will collect and identify rocks for their own personal collections. You will need a large egg carton (one with 18 slots), a rock field guide, white-out correction fluid, and a Sharpie marker. Have them begin by numbering each of the cups from #1 through #18. Every week, each student will collect a new rock and paint a bit of white-out on

each one. Then, they will write the sample number, i.e., #1, on each of the rocks. After that, you will help the students use the field guide(s) you have to identify the rocks they have collected. Once each student has identified their sample, have them record the name of the rock and several details about it on separate sheet of paper. You can use the template found in the Appendix on pg. 121.

ACTIVITIES FOR THIS WEEK

✂ I SPY – Play a game of “I Spy” to help the students work on their observation skills.

✂ COMPASS – Have the students make their own compass. You will need a straight pin, a milk jug, a knife, and a magnet. You can find the directions for this here:

📄 <http://sassafrasscience.com/how-to-make-a-compass/>

MEMORIZATION

COPYWORK/DICTATION

📄 COPYWORK SELECTION

"Never Eat Soggy Worms" stands for north, east, south, and west.

📄 DICTATION PASSAGE

A compass can help you know which direction you are traveling. The compass rose is the figure on a compass, map, or nautical chart that you can use to determine your bearings. The four main directions on a compass rose are north, south, west, and east.

NOTES

CHAPTER 2: A SUPER SCIENTIFIC START

CHAPTER SUMMARY

The chapter opens with the Man With No Eyebrows recalling his plan to kidnap the villains that the Sassafras Twins have encountered on their journey so far. We also find out that Tracey found the cameras he had hidden in Uncle Cecil's basement lab. Elsewhere, Blaine and Tracey arrive at their first location in Ecuador, where a little girl is fighting over her bike with a bully named José. Just as Blaine and Tracey are about to step in, two superheroes sweep in and save the day. It turns out that one of the rescuers is their local expert, Jase Judson, and he shares about continents and the layers of the Earth with the twins. Blaine and Tracey also find out that the two would-be superheroes are in Ecuador looking for the Hovering Shadow, which is said to have a hidden complex in a nearby volcano. The group heads back to the girl's uncle's duck boat shop where the girl, Alicia, tells her Uncle Arturo the story of what has happened. In the meantime, the Man With No Eyebrows uses the Dark Cape to kidnap Rona the Baker, take her back to his lab, and erase her memory. The chapter ends back at the duck boat shop, where Arturo confirms the belief that the Hovering Shadow lives in the vicinity of Mt. Cotapaxi, a nearby volcano.

SUPPLIES NEEDED

Demonstration	Projects and Activities
<ul style="list-style-type: none"> Modeling clay (you will need yellow, orange, red, blue, and green), Ruler 	<ul style="list-style-type: none"> Rock to identify Rice Krispies, Marshmallows, Butter, Icing

OPTIONAL SCHEDULE FOR TWO-DAYS-A-WEEK

Day 1	Day 2
<ul style="list-style-type: none"> Read the section entitled "Crushing Continents" of Chapter 2 in <i>SSA Volume 5: Geology</i>. Fill out a Geology Record Sheet on SL pg. 9 on continents. Add information on South America to the Continent Sheet on SL pg. 7. Go over the vocabulary words and enter them into the Geology Glossary on SL pg. 91. Do the copywork or dictation assignment and add it to the Geology Notes on SL pg. 13. 	<ul style="list-style-type: none"> Read the section entitled "Leaping through Layers" of Chapter 2 in <i>SSA Volume 5: Geology</i>. Fill out a Geology Record Sheet on SL pg. 10 on layers of the Earth. Label the surrounding bodies of water and/or land for South America on the Continent Map on SL pg. 8. Do the demo entitled "Model Earth"; write information learned on SL pg. 13. Work on one or all of the multi-week activities.

OPTIONAL SCHEDULE FOR FIVE-DAYS-A-WEEK

Day 1	Day 2	Day 3	Day 4	Day 5
<ul style="list-style-type: none"> Read the section entitled "Crushing Continents" of Chapter 2 in <i>SSA Volume 5: Geology</i>. Fill out a Geology Record Sheet on SL pg. 9 on continents. Add information on South America to the Continent Sheet on SL pg. 7. 	<ul style="list-style-type: none"> Read the section entitled "Leaping through Layers" of Chapter 2 in <i>SSA Volume 5: Geology</i>. Fill out a Geology Record Sheet on SL pg. 10 on layers of the earth. Label the surrounding bodies of water and/or land for South America on the Continent Map on SL pg. 8. 	<ul style="list-style-type: none"> Read one or all of the assigned pages from the encyclopedia of your choice; write narration on the Geology Notes Sheet on SL pg. 13. Do the demo entitled "Model Earth"; write information learned on SL pg. 13. 	<ul style="list-style-type: none"> Read one of the additional library books. Go over the vocabulary words and enter them into the Geology Glossary on SL pg. 91. Choose one of the activities for the week to do; fill out the project record sheet on pg. 15. 	<ul style="list-style-type: none"> Do the copywork or dictation assignment and add it to the Geology Notes sheet on SL pg. 13. Work on one or all of the multi-week activities.

SCIENCE-ORIENTED BOOKS

LIVING BOOK SPINE

- 📖 Chapter 2 of *The Sassafras Science Adventures Volume 5: Geology*

OPTIONAL ENCYCLOPEDIA READINGS

- 📖 *Basher Science Planet Earth* pp. 10-11 (Core), pp. 12-13 (Mantle), pp. 14-15 (Crust), pp. 40-41 (Continents)
- 📖 *Usborne Children's Encyclopedia* pp. 290-291 (South America)
- 📖 *Discover Science Planet Earth* pp. 8-9 (Inside Earth)
- 📖 *Kingfisher Science Encyclopedia* pp. 8-9 (Earth's Structure)



ADDITIONAL LIVING BOOKS

- 📖 *The Seven Continents (Rookie Read-About Geography)* by Will Mara
- 📖 *Continents in My World* by Ella Cane and Gail Saunders-Smith
- 📖 *Explore South America (Explore the Continents)* by Molly Aloian and Bobbie Kalman
- 📖 *Planet Earth/Inside Out* by Gail Gibbons
- 📖 *The Magic School Bus Inside the Earth (Magic School Bus)* by Joanna Cole and Bruce Degen
- 📖 *See Inside Planet Earth (Usborne Flap Book)* by Katie Daynes and Peter Allen

NOTEBOOKING (SCIDAT LOGBOOK INFORMATION)

This week, you can have the students begin to fill out the continent sheet for South America and begin to label the continent map for South America with the information from the chapter. They can also fill out the logbook sheets for continents and layers of the Earth. Here is the information they could include:

CONTINENT SHEET

SIZE AND LOCATION – This week, the students could include the following:

- ⇒ *South America is the fourth largest continent.*
- ⇒ *South America is in the western hemisphere.*

REGIONS – This information will be covered next week.

GEOLOGICAL FEATURES – This week, the students could include the following:

- ⇒ *South America is separated from North America by the Isthmus of Panama.*
- ⇒ *It is bordered by the Pacific Ocean on the west, the Atlantic Ocean on the East, and the Caribbean Sea to the North. To the south, is the Drake Passage and Antarctica.*

CONTINENT MAP

This week, have the students label the bordering bodies of water and land on the continent map. The students should label the following:

- ⇒ *Isthmus of Panama*
- ⇒ *Caribbean Sea*
- ⇒ *Pacific Ocean*
- ⇒ *Drake Passage*
- ⇒ *Atlantic Ocean*



GEOLOGY RECORD SHEETS

CONTINENTS

INFORMATION LEARNED

⇒ *With the exception of a few islands here and there, all the land on Earth can be divided into seven continents:*

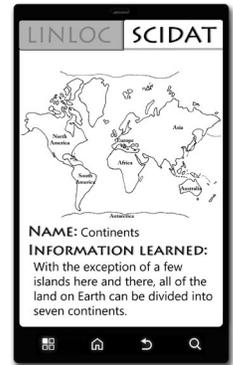
1. *North America*
2. *South America*
3. *Europe*
4. *Asia*
5. *Africa*
6. *Australia*
7. *Antarctica*

⇒ *The shape of these continents can easily be seen from space. Some are surrounded completely by water, like Australia.*

⇒ *Others touch each other, like Europe and Asia.*

⇒ *Each continent is divided into smaller regions called countries.*

⇒ *Some continents have lots of countries, while others only have a few.*



LAYERS OF THE EARTH

INFORMATION LEARNED

⇒ *The Earth has three main layers:*

1. *The crust*
2. *The mantle*
3. *The core*

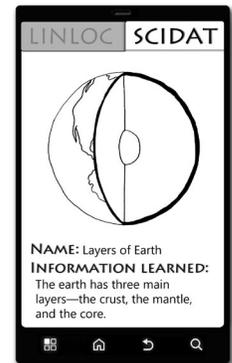
⇒ *The core of the Earth is found at the center of the globe. It has two parts:*

1. *The inner core, which is solid iron and is responsible for giving the Earth its magnetic properties.*
2. *The outer core, which is made of extremely hot liquid and molten rock.*

⇒ *The next layer out is the mantle, which is the thickest layer of the Earth. It is composed of extremely hot molten rock called magma.*

⇒ *The top layer of the Earth is the crust, which is the thinnest and most visible layer. It is thicker in some areas than in others, but basically it floats on top of the mantle layer. The crust is a layer of rock that makes up the ocean floor and the masses of land that make up the world's continents.*

⇒ *The magma from the mantle can sometimes reach the surface at thin spots in the crust, called hot spots. At these places, you can typically find volcanoes and other geothermal features.*



VOCABULARY

Have the older students look up the following terms in the glossary in the Appendix on pp. 127-128 or in a science encyclopedia. Then, have them copy each definition onto a blank index card or into their SCIDAT logbook.

📖 **CONTINENT** – A large area of land on Earth.

📖 **MAGMA** – Molten rock found under Earth's surface.

SCIENTIFIC DEMONSTRATION: MODEL EARTH

MATERIALS

- Modeling clay (you will need yellow, orange, red, blue, and green)
- Ruler

PROCEDURE

1. Have the students begin by making a ball about 1.2 cm across out of the yellow clay. This represents the Earth's inner core.
2. Then, have them make another layer about 3 cm across out of the red clay around the ball. This layer represents the Earth's outer core.
3. After that, have them add another layer about 6 cm across out of the orange clay around the ball. This layer represents the Earth's mantle.
4. Next, have the students make several flattened pieces of blue and green clay to represent the Earth's crust and layer those pieces over the ball.
5. Finally, have the students cut the ball in half to observe the different layers of their model Earth.

EXPLANATION

The students should see the different layers in their model just as if we were to cut the Earth in half to peek inside!

TAKE IT FURTHER

Have the students make a paper mache model of the Earth. Directions for this can be found here:

🔗 <https://www.weirdunsocializedhomeschoolers.com/step-by-step-making-paper-mache-earth/>

MULTI-WEEK PROJECTS AND ACTIVITIES

MULTI-WEEK PROJECTS

✂️ **ROCK COLLECTION** – Over the weeks of this study, the students will be collecting and identifying rocks for their own personal collections. This week, have the students each collect a new rock and paint a bit of white out on it. Then, they will write the sample number #2 on the rock. After that, use the field guide(s) you have to identify the rocks they collected. Once the students have identified their samples, have each student record the name of their rock and several details about it on separate sheet of paper. You can use the template found in the Appendix on pg. 121.

ACTIVITIES FOR THIS WEEK

✂️ **CONTINENTS** – Have the students label and color the continents (North America, South America, Europe, Asia, Africa, Australia, and Antarctica) on a map of the Earth. You can use the map template provided in the Appendix on pg. 124. After you do that, memorize the continents with the help of the following song:

🔗 The Continent Song - <https://www.youtube.com/watch?v=fqsCWZtZlk4>

✂️ **INSIDE THE EARTH** – Make an edible Earth core with the students using Rice Krispie treats and icing. See the following website for directions:

🔗 <http://teachbesideme.com/geography-earths-core-project/>



MEMORIZATION

COPYWORK/DICTATION

🔗 COPYWORK SENTENCE

The three layers of the Earth are the crust, the mantle, and the core.

☞ DICTATION SELECTION

The Seven Continents (Author unknown, from the At Youth Safety website)

North America, South America joined in the West.

Europe and Asia meet together, and on Africa they rest.

Australia stands alone, floating down below.

And Antarctica is the loneliest because no one wants to go.

NOTES

GEOLOGY QUIZ # 1

CHAPTERS 2 AND 3

1. A continent is a (small / large) area of (land / water).

2. Match the layers of the Earth with their description.

Crust _____

Mantle _____

Core _____

A. Is found at the center of the globe and has two parts.

B. The thickest layer of the Earth, which is composed of extremely hot molten rock called magma.

C. The top layer, which is the thinnest and most visible layer.

3. **True or False:** There are volcanoes under the sea.

4. A volcano that erupts often is called an _____ volcano.

Busy

Active

Playful

Dormant



5. Geothermal features occur at _____ in the Earth's crust.

6. What is the name of the world's longest river? (*Hint: The river is found in South America.*)

7. Color South America on the map below.

