

I. LAPBOOK OVERVIEW

CHAPTER LESSONS

2. READ

3. WRITE

Build your students' science vocabulary with words relevant to the topics the students are studying. Plus, get the directions for the mini-books that your students will be making to correspond to each location.

4. DO

Know what materials you will need to do a weekly hands-on science activity that coordinates with the topic. This section lists the supplies you will need, provides easy-to-follow steps, and explanations to make it a snap to complete the scientific demonstration.

5. TWO LESSONS PER LOCATION

Find two lessons per location, each following the same format of read, write, and do.

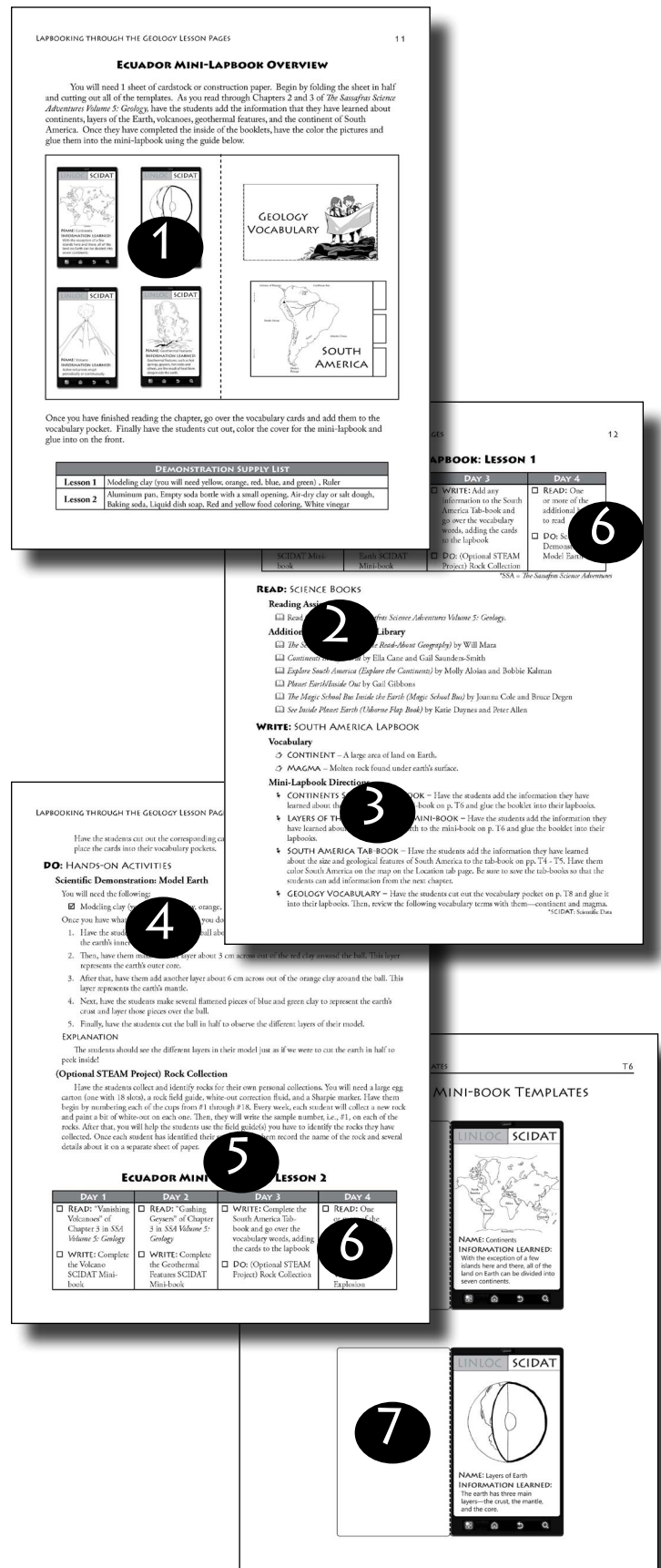
6. OPTIONAL SCHEDULE

See how you could plan out each lesson over a week with the 4-day grid schedule. These schedules will make planning your weekly science adventure a snap!

THE REST

7. TEMPLATES AND MORE

In the appendix, you will find project templates and a full glossary. At the back of this guide, you will find all of the mini-book templates for the lapbooks.



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LAPBOOKING THROUGH GEOLOGY

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QUICK START GUIDE

Welcome to your super, scientific journey with the Sassafras Twins!! The information and activities in this guide will help you turn a simple adventure novel into a simple science program for your early elementary students. Let's start by answering three pressing questions!

WHAT WILL WE LEARN?

Students will learn about geology, which is the study of rocks. See p. 9 for a list of the topics explored in this program.

WHAT DO I NEED?

In addition to this lapbooking guide, you will need the following materials:

1. **Novel** – All the main reading assignments are from *The Sassafras Science Adventures Volume 5: Geology*. You can get the paperback novel, the Kindle version, or the audiobook.
2. **Demonstration Supplies** – See a full list on p. 10, or save yourself time and purchase the *Sassafras Science Year 3 Experiment Kit*, which includes the materials for both volume 5 and volume 6.

WHAT WILL A WEEK LOOK LIKE?

Each week you and your students will do the following activities:

- ✍️ **Read** scientific information from an adventure-filled novel, also known as a living book, and discuss what you read.
- ✍️ **Write** down what the students have learned on the journey in the coordinating mini-book.
- ✍️ **Do** hands-on science through demonstrations using the directions found in this guide.

For a more detailed explanation of the components in each lesson, we highly recommend checking out the peek inside this guide on p. 6 and reading the introduction on pp. 7-9. The chapter lessons begin on p. 11.



THE
SASSAFRAS SCIENCE
ADVENTURES

As the author and publisher of *Lapbooking through the Geology with the Sassafras Twins*, I encourage you to contact me with any questions or problems that you might have concerning this program at support@elementalscience.com. I, or a member of our team, will be more than happy to assist you. I hope that you will enjoy creating memories using *Lapbooking through the Geology with the Sassafras Twins*!

~ Paige Hudson

LAPBOOKING THROUGH GEOLOGY

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INTRODUCTION

Lapbooking through the Geology with the Sassafras Twins is a unique and versatile program that leads you through a survey of rocks and our planet using a series of eight mini-lapbooks to document the journey. The program is centered around the living book, *The Sassafras Science Adventures Volume 5: Geology*. It is designed to be a gentle approach to homeschool science education based on the Unit Study method suggested in *Success in Science: A Manual for Excellence in Science Education* by Bradley and Paige Hudson.

WHAT IS A LAPBOOK?

Lapbooks are educational scrapbooks that fit into the lap of a student. Typically they are a collection of related mini-books on a certain subject that have been glued into a file folder for easy viewing, but they can also include pictures or projects that the students have completed. In the same way that notebooking does not require regurgitation of facts; lapbooking causes the students to interact with the materials instead of just responding to comprehension questions. To learn more about lapbooking, you can read the following articles:

- **What are lapbooks?** – This article shares what lapbooks are and how you can use them.
 <https://elementalscience.com/blogs/news/what-are-lapbooks>
- **3 Common Misconceptions about Lapbooks** – This article looks at three of the most common mistaken beliefs about lapbooks.
 <https://elementalscience.com/blogs/news/3-misconceptions-about-lapbooks>

WHAT IS INCLUDED IN THIS PROGRAM?

Lapbooking through Zoology with the Sassafras Twins includes all of the basic components of elementary science education that are explained in *Success in Science*.

1. **{READ}** Science Books – Elementary students are an empty bucket waiting to be filled with information and science-oriented books are a wonderful way to do that. These books can include appropriate children's science encyclopedias, living books for science and/or children's non-fiction science books. In this program, the reading assignments are from the living book, *The Sassafras Science Adventures Volume 5: Geology*. I have also included a list of additional books from the library.
2. **{WRITE}** Lapbooks – The purpose of the notebooking component for elementary science education is to verify that the students have placed at least one piece of information into their knowledge bucket. You can use notebooking sheets, lapbooks, and/or vocabulary words to fulfill this requirement. This unit includes all the templates and pictures you will need to complete a series of mini-lapbooks as well as vocabulary words to coordinate with each lesson.
3. **{DO}** Hands-on Activities – Scientific demonstrations, observations, and STEAM* projects are meant to spark the students' enthusiasm for learning science, to work on their observation skills and to demonstrate the principles of science for them. This component of elementary science education can contain scientific demonstrations, hands-on projects and/or nature studies.

Each lesson in this guide includes suggested hands-on science activities to fulfill this section of elementary science instruction.

*STEAM: Science, Technology, Engineering, Art, and Math

These concepts are more fully developed in our book, or you can read the following articles from to learn more:

- **10 Posts you must read about living books** – This article shares links to 10 different articles that will help you to gain a clear picture of what living books are.
<https://elementalscience.com/blogs/news/10-posts-you-must-read-about-living-books>
- **The Basics of Notebooking** – This article details the basic components of notebooking along with how a few suggestions on what notebooking can look like.
<https://elementalscience.com/blogs/news/what-is-notebooking>
- **Scientific Demonstrations vs. Experiments** – This article explains the difference between scientific demonstrations and experiments along with when and how to employ these methods.
<http://elementalscience.com/blogs/news/89905795-scientific-demonstrations-or-experiments>

HOW TO USE THIS PROGRAM

Each lesson is designed to be completed over several days or up to one week. The lesson contains reading assignments from *The Sassafras Science Adventures Volume 5: Geology*. You can choose to break each chapter up over two days or read it all at once. If you are using this program with younger students, read the selected chapters to them. If you are using this program with older students, you can choose to have them read the assigned chapters on their own or you can read the selected pages to them. (NOTE—Chapter 1 and 18 of *The Sassafras Science Adventures Volume 5: Geology* are not scheduled as a part of this program. You will need to read chapter 1 before beginning and chapter 18 after you finish.)

After you complete the reading assignment, have the students tell you what they have learned about the topics and the continent from the selection. This can simply be what they found to be the most interesting or something new that they have learned from the reading. You can choose to write the sentences for them or have them copy the words into the mini-book. Once the students have finished writing, have them color the related pictures. When the mini-book is complete, glue it into the lapbook using the overview sheet as a guide.

At another time during the week, review the vocabulary words with the students. You can have them memorize each one or just go over the words with the lesson. I have included a set of blank vocabulary cards in the Appendix on pp. 54-55. If you use the blank vocabulary cards, have the students look up the vocabulary words in the science encyclopedia of your choice or the glossary included in the Appendix on pp. 57-58.

Finally, you can finish the lesson by doing the related scientific demonstration. If you would like to have your students write a lab report, I have included a template for you in the Appendix on pp. 47-48. After you finishing the demonstration, you can finish the week by reading to the students one

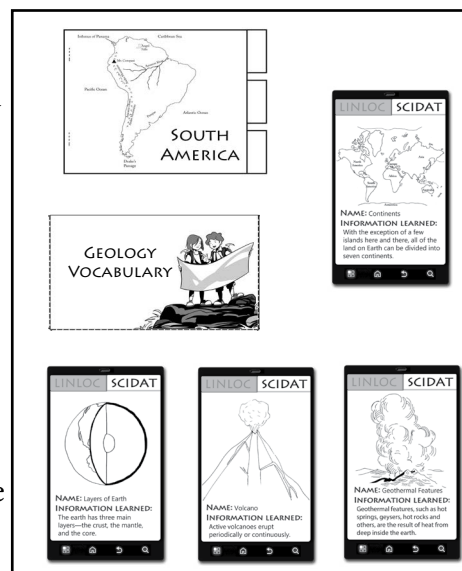
of the related books from the additional book list. If you would like to record what they have learned from these books, I have included a book narration sheet in the Appendix on p. 49.

HOW LONG IT SHOULD TAKE

I have included possible schedules for completed each mini-lapbook. These schedules spread the work for each lesson out over 4 days. If you choose to complete the program in this manner, each mini-lapbook will take you two weeks to complete, which means that this program will provide you about a semesters worth of material.

OPTIONS - 8 MINI-LAPBOOKS OR 1 FULL LAPBOOK

If you would like to create one full lapbook instead of a series of eight mini-lapbooks, simply arrange the interior components of each onto one full sheet of construction paper or one side of a file folder like below. We have included a cover for a full lapbook in the Appendix on p. 50. See a sample of a full lapbook in the following video:



<https://www.youtube.com/watch?v=4LMhkVcXYfk&t=3s>

TOPICS COVERED

The Sassafra Science Adventures Volume 5: Geology covers a variety of aspects of geology, such as:

- Types of Rocks (Igneous, Metamorphic, and Sedimentary)
- Earth's Geographic Features
- Continents
- Basic Mapping Skills

In the process, you will learn about the following specific topics:

- | | |
|-----------------------|----------------|
| • Layers of the Earth | • Beryl |
| • Volcanoes | • Tsunamis |
| • Geysers | • Diamonds |
| • Basalt | • Caves |
| • Pumice | • Stalagmites |
| • Fjords | • Stalactites |
| • Glaciers | • Soil |
| • Meteors | • Clay |
| • Gneiss | • Sandstone |
| • Maps | • Islands |
| • Latitude | • Fossils |
| • Longitude | • Amber |
| • Erosion | • Fossil Fuels |
| • Plate Tectonics | • Mountains |
| • Earthquakes | |

SUPPLY LIST

The following supplies will be needed to complete the scientific demonstrations suggested in this guide.

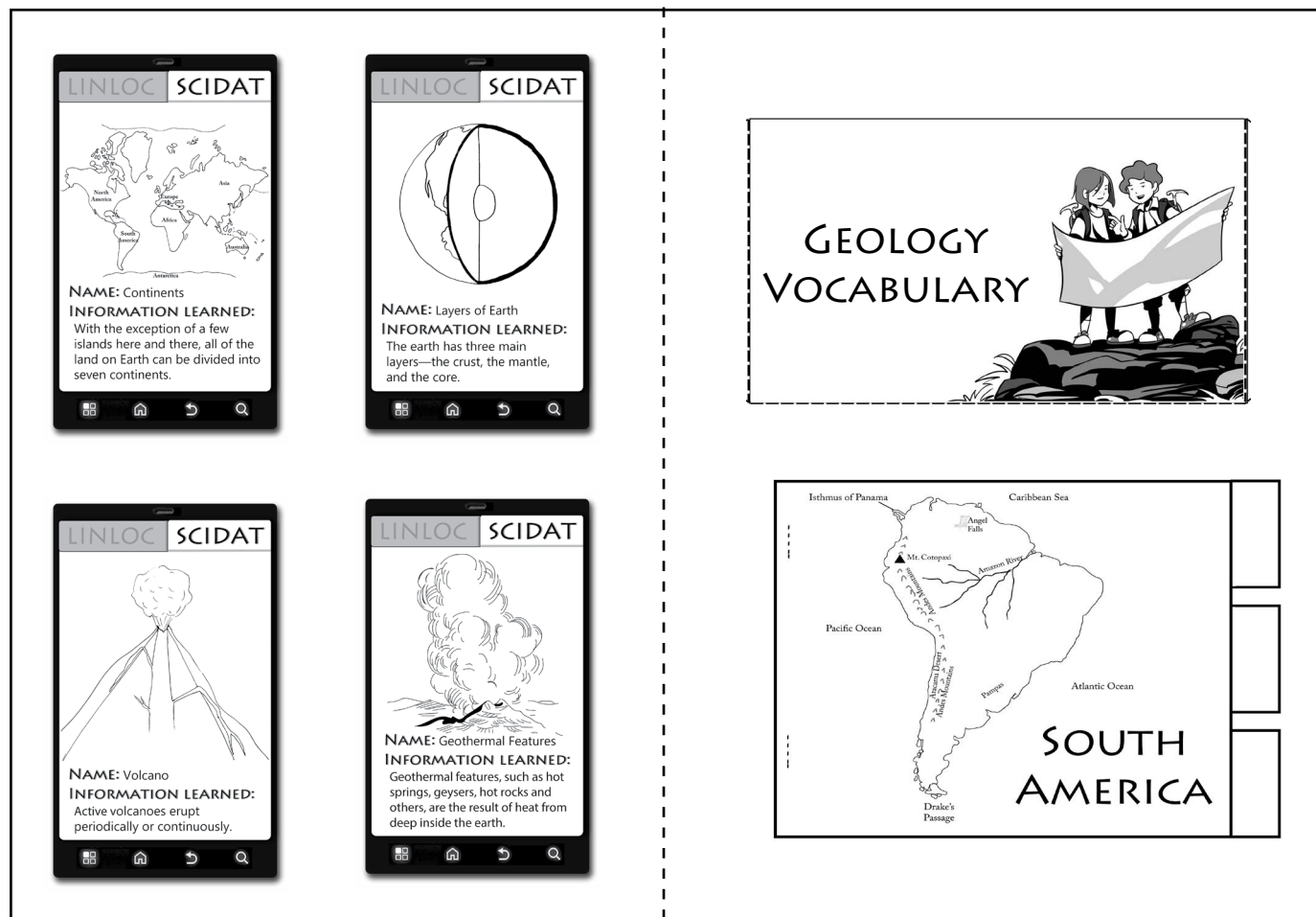
CHAPTER	SUPPLIES NEEDED
2: MODEL EARTH	Modeling clay (you will need yellow, orange, red, blue, and green) , Ruler
3: VOLCANIC EXPLOSION	Aluminum pan, Empty soda bottle with a small opening, Air-dry clay or salt dough, Baking soda, Liquid dish soap, Red and yellow food coloring, White vinegar
4: MOLTEN ROCK	Several different colors of crayon, An old pot, Wax paper (2 sheets), Straw
5: FLOATING ROCKS	Clear jar, Water, Small piece of pumice
6: GLACIAL MOVEMENT	Can of sweetened condensed milk, Cornstarch, Cereal box, Chocolate chips or nuts, Icing
7: CHANGING ROCKS	Six different colors of crayon, Old grater, Aluminum foil, Bowl, Hot water
8: FLAT OR ROUND	Blue balloon (with the continents drawn or printed on it), Flat map, Pin
9: SANDY CHANGES	Sandpaper, Bar of soap, Plate
10: TECTONIC MOVEMENT	Marshmallow creme (or whipping cream), Graham cracker, Plate, Bowl with about an inch of water
11: FAUX EMERALDS	Small Rock, Jar with lid, Bowl, Water, Borax, Green food coloring, Sandpaper (Optional)
12: ROCKY LAYERS	Several different colors of crayons, Old grater, Butter knife, Crayon or pencil sharpener, Aluminum foil
13: DRIPSTONE	2 Cups, Warm water, Yarn (1 and a half feet in length), Baking soda, 2 Washers, Paper clip, Paper towel
14: SOIL OBSERVATIONS	Soil from your backyard, Magnifying glass, Small trowel, Bowl
15: DISSOLVING ROCK	Jar, Piece of limestone, White vinegar
16: FERNY IMPRESSIONS	Air dry clay, Fern frond, Rolling pin
17: MOUNTAIN MODEL	Cardboard, Air-dry clay or salt dough, Paint (white, grey, green, and blue)



LESSON PAGES

ECUADOR MINI-LAPBOOK OVERVIEW

You will need 1 sheet of cardstock or construction paper. Begin by folding the sheet in half and cutting out all of the templates. As you read through Chapters 2 and 3 of *The Sassafras Science Adventures Volume 5: Geology*, have the students add the information that they have learned about continents, layers of the Earth, volcanoes, geothermal features, and the continent of South America. Once they have completed the inside of the booklets, have the color the pictures and glue them into the mini-lapbook using the guide below.



Once you have finished reading the chapter, go over the vocabulary cards and add them to the vocabulary pocket. Finally have the students cut out, color the cover for the mini-lapbook and glue into on the front.

DEMONSTRATION SUPPLY LIST	
LESSON 1	Modeling clay (you will need yellow, orange, red, blue, and green) , Ruler
LESSON 2	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

ECUADOR MINI-LAPBOOK: LESSON 1

DAY 1	DAY 2	DAY 3	DAY 4
<input type="checkbox"/> READ: “Crushing Continents” of Chapter 2 in <i>SSA Volume 5: Geology</i> <input type="checkbox"/> WRITE: Complete the Continent SCIDAT Mini-book	<input type="checkbox"/> READ: “Leaping through Layers” of Chapter 2 in <i>SSA Volume 5: Geology</i> <input type="checkbox"/> WRITE: Complete the Layers of the Earth SCIDAT Mini-book	<input type="checkbox"/> WRITE: Add any information to the South America Tab-book and go over the vocabulary words, adding the cards to the lapbook <input type="checkbox"/> DO: (Optional STEAM Project) Rock Collection	<input type="checkbox"/> READ: One or more of the additional books to read <input type="checkbox"/> DO: Scientific Demonstration: Model Earth







*SSA = *The Sassafras Science Adventures*

READ: SCIENCE BOOKS

READING ASSIGNMENTS



 Read Chapter 2 of *The Sassafras Science Adventures Volume 5: Geology*.

ADDITIONAL BOOKS FROM THE LIBRARY





-  *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

WRITE: SOUTH AMERICA LAPBOOK

VOCABULARY

-  **CONTINENT** – A large area of land on Earth.
-  **MAGMA** – Molten rock found under earth’s surface.

MINI-LAPBOOK DIRECTIONS

-  **CONTINENTS SCIDAT* MINI-BOOK** – Have the students add the information they have learned about the continents to the mini-book on p. T6 and glue the booklet into their lapbooks.
-  **LAYERS OF THE EARTH SCIDAT MINI-BOOK** – Have the students add the information they have learned about the layers of the Earth to the mini-book on p. T6 and glue the booklet into their lapbooks.
-  **SOUTH AMERICA TAB-BOOK** – Have the students add the information they have learned about the size and geological features of South America to the tab-book on pp. T4 - T5. Have them color South America on the map on the Location tab page. Be sure to save the tab-books so that the students can add information from the next chapter.
-  **GEOLOGY VOCABULARY** – Have the students cut out the vocabulary pocket on p. T8 and glue it into their lapbooks. Then, review the following vocabulary terms with them—continent and magma.

*SCIDAT: Scientific Data

Have the students cut out the corresponding cards on p. T8. After they color the pictures, have them place the cards into their vocabulary pockets.

DO: HANDS-ON ACTIVITIES

SCIENTIFIC DEMONSTRATION: MODEL EARTH

You will need the following:

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

Once you have what you need, here is what you do:

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.

This is what you should see and why:

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

(OPTIONAL STEAM PROJECT) ROCK COLLECTION

Have the students 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 a separate sheet of paper.

ECUADOR MINI-LAPBOOK: LESSON 2






DAY 1	DAY 2	DAY 3	DAY 4
<input type="checkbox"/> READ: "Vanishing Volcanoes" of Chapter 3 in <i>SSA Volume 5: Geology</i> <input type="checkbox"/> WRITE: Complete the Volcano SCIDAT Mini-book	<input type="checkbox"/> READ: "Gushing Geysers" of Chapter 3 in <i>SSA Volume 5: Geology</i> <input type="checkbox"/> WRITE: Complete the Geothermal Features SCIDAT Mini-book	<input type="checkbox"/> WRITE: Complete the South America Tab-book and go over the vocabulary words, adding the cards to the lapbook <input type="checkbox"/> DO: (Optional STEAM Project) Rock Collection	<input type="checkbox"/> READ: One or more of the additional books to read <input type="checkbox"/> DO: Scientific Demonstration: Volcanic Explosion

READ: SCIENCE BOOKS

READING ASSIGNMENT



 Read Chapter 3 of *The Sassafras Science Adventures Volume 5: Geology*.

ADDITIONAL BOOKS FROM THE LIBRARY






-  *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
-  *Geysers (True Books: Earth Science)* by Larry Dane Brimner
-  *Geysers: What They Are and How They Work* by Scott T. Bryan

WRITE: SOUTH AMERICA LAPBOOK

VOCABULARY

-  **GEOHERMAL FEATURE** – A feature that is related to or produced by the internal heat of the earth.
-  **LAVA** – Molten rock found on the earth's surface.

MINI-LAPBOOK DIRECTIONS

-  **VOLCANOES SCIDAT MINI-BOOK** – Have the students add the information they have learned about volcanoes to the mini-book on p. T7 and glue the booklet into their lapbooks.
-  **GEOHERMAL FEATURES SCIDAT MINI-BOOK** – Have the students add the information they have learned about geothermal features to the mini-book on p. T7 and glue the booklet into their lapbooks.
-  **SOUTH AMERICA TAB-BOOK** – Have the students add the information they have learned about the regions and geological features of South America to the tab-book on pp. T4 - T5. Then, staple the pages together and glue the tab-book into their mini-lapbooks.
-  **GEOLOGY VOCABULARY** – Review the following vocabulary terms with the students—geothermal feature and lava. Have the students cut out the corresponding cards on p. T8. After they color the pictures, have them place the cards into their vocabulary pockets.
-  **ECUADOR MINI-LAPBOOK COVER** – Have the students cut out the cover page on p. T3, color it, and glue it on the front of their mini-lapbooks.

DO: HANDS-ON ACTIVITIES

SCIENTIFIC DEMONSTRATION: VOLCANIC EXPLOSION

You will need the following:

- ☒ 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

Once you have what you need, here is what you do:

1. Have the students begin by placing the soda bottle at the center of the aluminum pan.
2. Then, have them mold the clay or salt dough around the bottle in the shape of a volcano.
3. Once they are finished, set it aside to dry. This may take several hours or overnight, depending on

how thick the clay is.

4. Next, have the students paint and decorate their volcano creations.
5. Once the paint dries, head outside or place the volcano in a location that you don't mind getting dirty, as the following part can be very messy.
6. Then, pour $\frac{1}{4}$ cup of baking soda into the bottle and add 2 Tbsp of liquid dish soap plus 4 drops of the red food coloring and 4 drops of yellow food coloring.
7. Finally, add about a $\frac{1}{2}$ cup of vinegar into the container, step back, and watch what happens.

This is what you should see and why:

The students should see a small eruption from their model volcano. The vinegar and the baking soda react to form carbon dioxide gas. The gas bubbles are trapped by the soap and forced up and out of the soda bottle opening.

(OPTIONAL STEAM PROJECT) ROCK COLLECTION

Have the students collect and identify another rock for their rock collections.



TEMPLATES

ECUADOR MINI-LAPBOOK COVER PAGE

MY GUIDE TO GEOLOGY IN ECUADOR

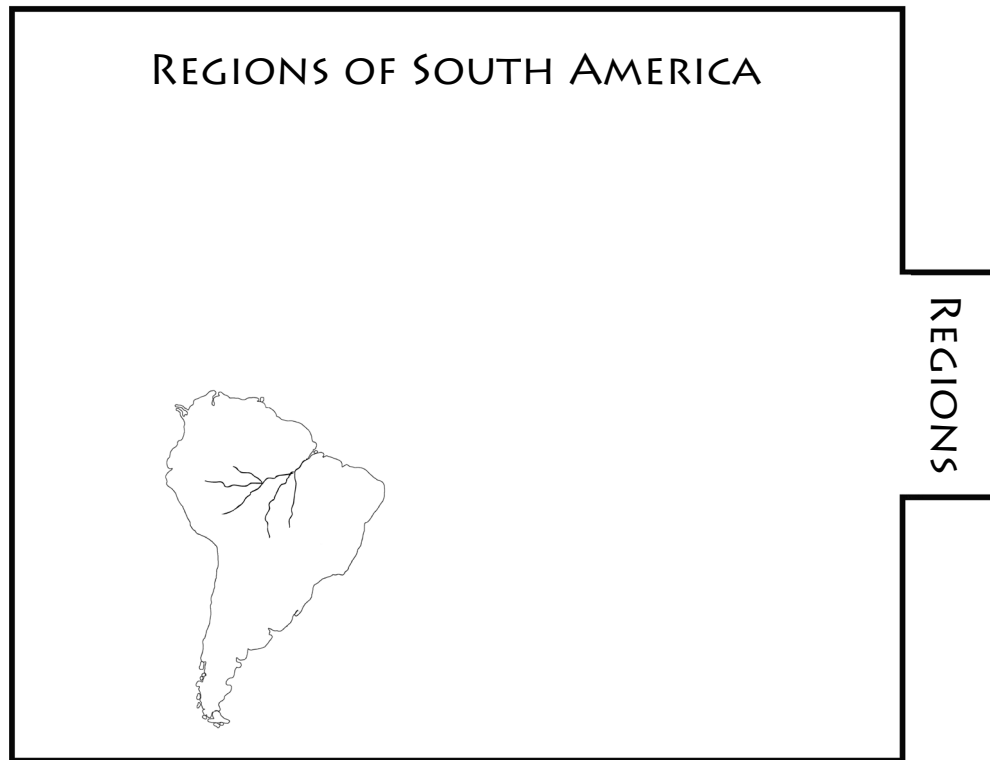


BY: _____
& THE SASSAFRAS TWINS

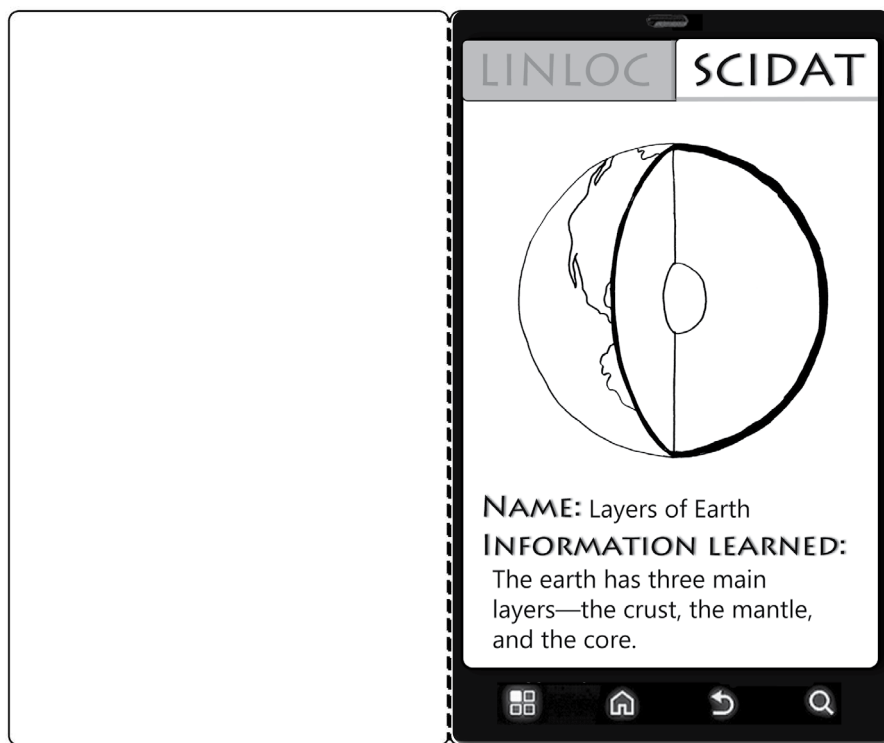
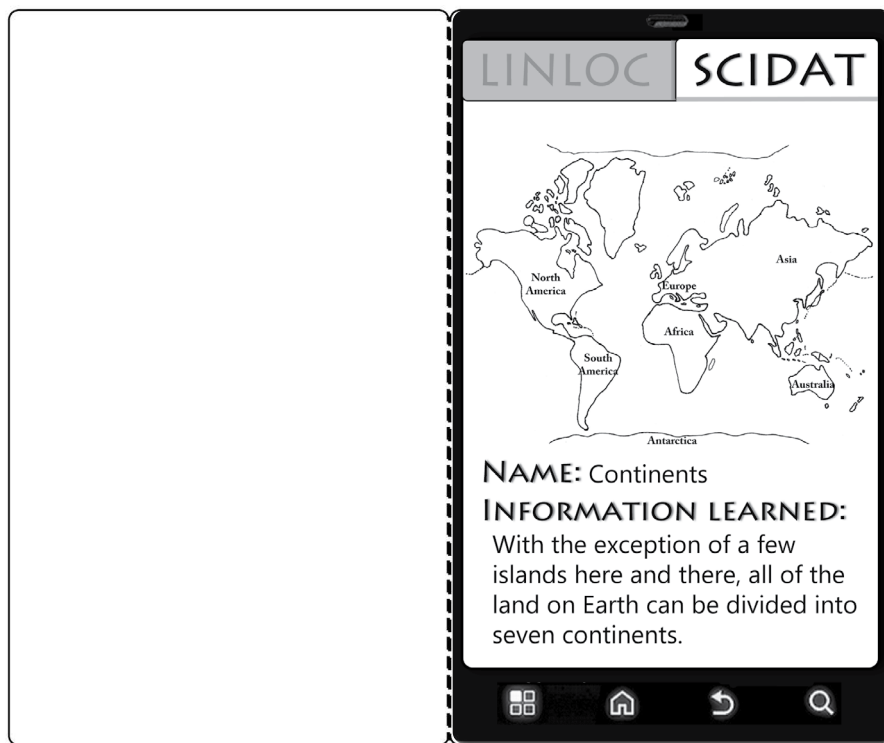
SOUTH AMERICA TAB-BOOK TEMPLATES



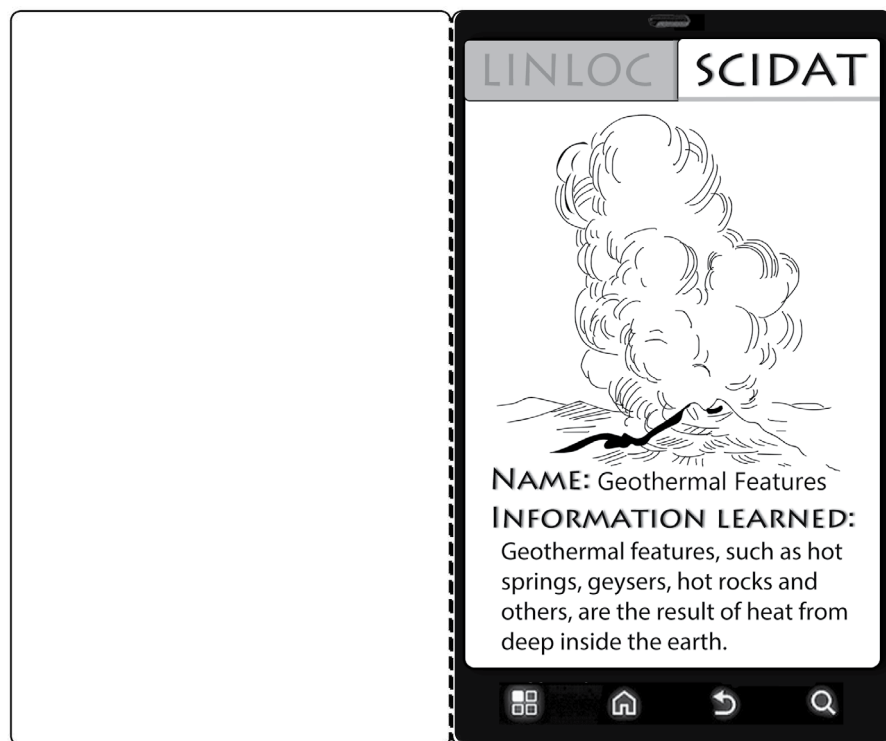
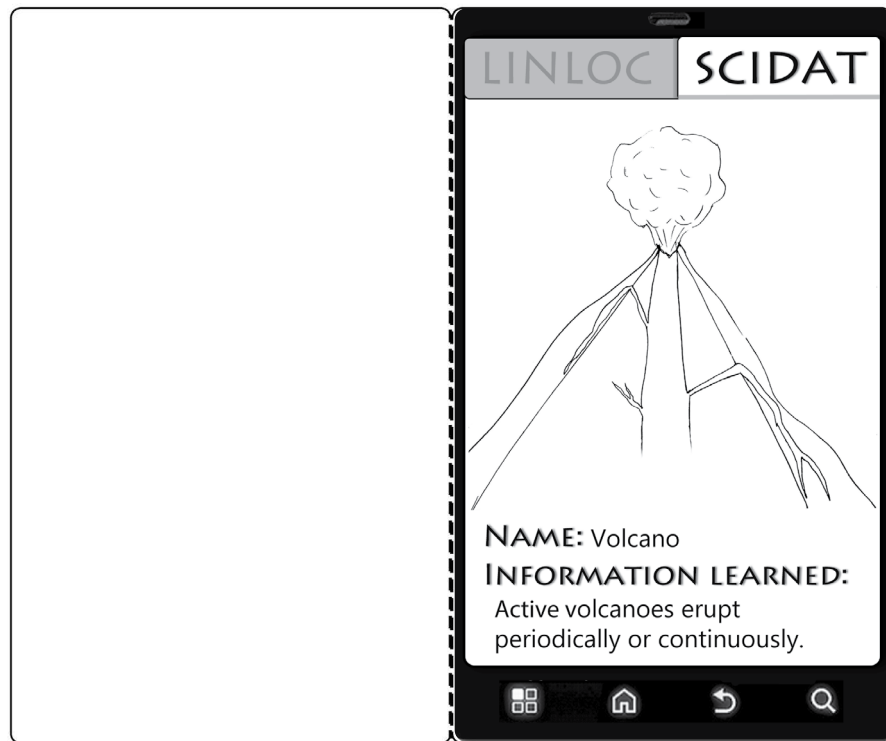
SOUTH AMERICA TAB-BOOK TEMPLATES

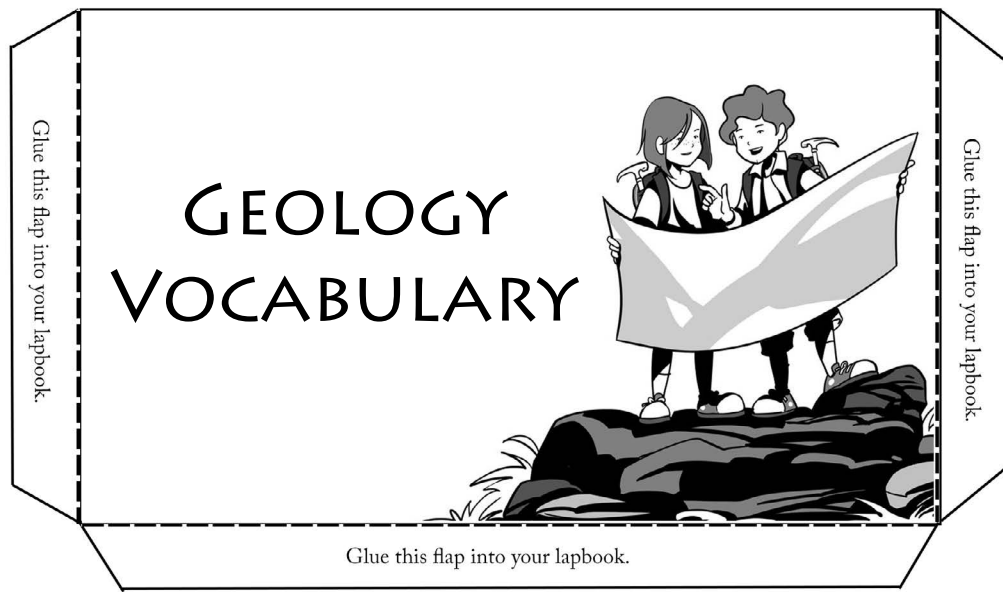


ECUADOR SCIDAT MINI-BOOK TEMPLATES

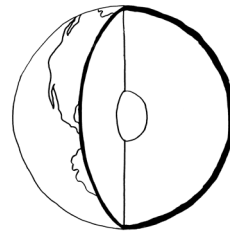


ECUADOR SCIDAT MINI-BOOK TEMPLATES





CONTINENT – A large area of land on Earth.



MAGMA – Molten rock found under earth's surface.



GEOHERMAL FEATURE
– A feature that is related to or produced by the internal heat of the earth.



LAVA – Molten rock found on the earth's surface.