# The Sassafras Guide to Botany



WRITTEN BY PAIGE HUDSON

# THE SASSAFRAS GUIDE TO BOTANY

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# THE SASSAFRAS GUIDE TO BOTANY 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 3: Botany.* 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 nonfiction 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 botany.

Each of the chapters in this guide corresponds directly with the chapters in *The Sassafras Science Adventures Volume 3: Botany.* 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 plants. 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 3: Botany.* 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 around 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)** LIVING BOOK SPINE This section contains the corresponding chapter in *The Sassafras Science Adventures Volume 3: Botany.*
- **P** ENCYCLOPEDIA READINGS This section contains possible reading assignments from:
  - DK First Nature Encyclopedia (best for 1<sup>st</sup> through 4<sup>th</sup> grades)
  - Usborne Internet-linked Science Encyclopedia (best for grades 3rd through 5th grades)
  - *Kingfisher Science Encyclopedia* (best for 4<sup>th</sup> through 7<sup>th</sup> grades)
  - DK Encyclopedia of Nature (best for 5<sup>th</sup> through 7<sup>th</sup> 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 plant information the student could include on their botany record, biome, and plant overview 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:

- <sup>(1)</sup> What is notebooking? <u>http://sassafrasscience.com/what-is-notebooking/</u>
- How to use notebooking with different ages <u>http://sassafrasscience.com/notebooking-with-different-ages/</u>
- 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: Botany 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. 105-106 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

X 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

In the back of this guide there are 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 you 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 botany. It is explained in more detail in Chapter 1 of this guide. You can choose to make your own or purchase a premade logbook from Elemental Science. *The Official Sassafras SCIDAT Logbook: Botany Edition* has all the pages the students will need to create their own logbook. 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 info@elementalscience. com with any questions or problems that you might have concerning *The Sassafras Guide to Botany*. 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 plants 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 3: Botany

## ENCYCLOPEDIA READINGS

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

- *Q* DK First Nature Encyclopedia (best for 1st through 4th)
- **V** Usborne Internet-linked Science Encyclopedia (best for grades 3rd through 5th)
- *¶* Kingfisher Science Encyclopedia (best for 4th through 7th)
- V DK Encyclopedia of Nature (best for 5th through 7th) (NOTE – The DK Encyclopedia of Nature book has been known to go in- and out-of-print. However, it is still one of the best options for older students. There is also a CD that contains the same information if you are unable to location this encyclopedia.)

## **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 anatomy

The Official Sassafras Student SCIDAT Logbook: Botany 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:

1 http://sassafrasscience.com/volume-3-links/

# **ADDITIONAL LIVING BOOKS LISTED BY CHAPTER**

## CHAPTER 1

- Many Biomes, One Earth by Sneed B. Collard III
- What Is a Biome? (Science of Living Things) by Bobbie Kalman
- Earth's Biomes (Sci-Hi: Life Science) by Donna Latham and Adam Miller
- Green Genius Guide: What are Ecosystems, Biomes, Ecotones, and more... by Richa Sharma

## CHAPTER 2

- General Control of Charles Investigate. Plants) by Derek Fell
- Description: The Great Kapok Tree: A Tale of the Amazon Rainforest by Lynne Cherry
- A Rainforest Habitat (Introducing Habitats) by Molly Aloian and Bobby Kalman

## CHAPTER 3

- Description: The Rainforest Grew All Around by Susan K. Mitchell and Connie McLennan
- Dature's Green Umbrella (Mulberry books) by Gail Gibbons
- General Fungi (Kid's Guide to the Classification of Living Things) by Elaine Pascoe, Janet Powell and Dwight Kuhn

## CHAPTER 4

- Do Roses for Harry! by Gene Zion and Margaret Bloy Graham
- Roses (Flowers) by John F. Prevost
- Jack's Garden by Henry Cole
- Description: The Animal Hedge by Paul Fleischman and Bagram Ibatoulline

## CHAPTER 5

- What If There Were No Bees?: A Book About the Grassland Ecosystem by Suzanne Slade and Carol Schwartz
- What is Pollination? (Big Science Ideas) by Bobbie Kalman
- Anansi and the Moss-covered Rock by Eric A. Kimmel and Janet Stevens
- Bodies from the Bog by James M. Deem
- Big Belching Bog by Phyllis Root and Betsy Bowen

## CHAPTER 6

- What If There Were No Bees?: A Book About the Grassland Ecosystem (Food Chain Reactions) by Suzanne Slade and Carol Schwartz
- Grasslands (About Habitats) by Cathryn Sill and John Sill
- A Grassland Habitat (Introducing Habitats) by Kelley MacAulay and Bobbie Kalman
- In the Tall, Tall Grass (An Owlet Book) by Denise Fleming

## CHAPTER 7

- Bloomin' Tales: Seven Favorite Wildflower Legends by Cherie Foster Colburn and Joy Fisher Hein
- How a Seed Grows (Let's-Read-and-Find... Science 1) by Helene J. Jordan and Loretta Krupinski
- From Seed to Plant by Gail Gibbons
- The Tiny Seed by Eric Carle
- Description: A Kid's Herb Book: For Children of All Ages by Lesley Tierra

## CHAPTER 8

- De Palm Trees by Marcia S. Freeman
- Carnivorous Plants by Cynthia Overbeck and Kiyoshi Shimizu
- Weird Meat-Eating Plants (Bizarre Science) by Nathan Aaseng
- Densey Clyne Plants of Prey (Nature Close-Ups) by Densey Clyne

## CHAPTER 9

- A Little Book of Slime: Everything That Oozes, from Killer Slime to Living Mold by Clint Twist
- Rature Close-Up Slime, Mold and Fungi by Elaine Pascoe
- The Jeff Corwin Experience Into Wild Borneo by Elaine Pascoe
- In the Rainforest (Let's-Read-and-Find... Science 2) by Kate Duke

## CHAPTER 10

- General From Bulb to Daffodil (Scholastic News Nonfiction Readers) by Ellen Weiss
- What Are Bulbs and Roots? (Plants Close-Up) by Molly Aloian
- I Taiga (Biomes of the World) by Elizabeth Kaplan
- Life in the Boreal Forest by Brenda Z. Guiberson and Gennady Spirin

## CHAPTER 11

- Protists: Algae, Amoebas, Plankton, and Other Protists (A Class of Their Own) by Rona Arato
- Explore the Tundra (Explore the Biomes) by Linda Tagliaferro
- Arctic Tundra by Donald Silver and Patricia Wynne

- Description: A Walk in the Tundra (Biomes of North America) by Rebecca L. Johnson and Phyllis V. Saroff
- Deter Benoit Tundra (New True Books: Ecosystems) by Peter Benoit

#### CHAPTER 12

- Deverful Plant Cells (Microquests) by Rebecca L. Johnson and Jack Desrocher
- Plant Cells (Let's Relate to Genetics) by Penny Dowdy and Jessica Cohn
- Cooking with Sunshine: How Plants Make Food (Plant-Ology) by Ellen Lawrence
- Photosynthesis: Changing Sunlight into Food (Nature's Changes) by Bobbie Kalman
- The Magic School Bus Gets Planted: A Book About Photosynthesis by Lenore Notkin

#### CHAPTER 13

- Description: The Apple Pie Tree by Zoe Hall and Shari Halpern
- How Do Apples Grow? by Betsy Maestro and Giulio Maestro
- A Tree Is a Plant (Let's-Read-and-Find... Science) by Clyde Robert Bulla and Stacey Schuett
- Investigating Why Leaves Change Their Color (Science Detectives) by Ellen Rene
- Temperate Deciduous Forests: Lands of Falling Leaves (Amazing Science: Ecosystems) by Laura Purdie Salas and Jeff Yesh

#### CHAPTER 14

- Coniferous Forests (Biomes of the World) by Jeanne Nagle
- Evergreens Are Green (Science Emergent Readers) by Susan Canizares
- Where Would I Be in an Evergreen Tree? by Jennifer Blomgren and Andrea Gabriel
- General From Pinecone to Pine Tree (Scholastic News Nonfiction Readers: How Things Grow) by Ellen Weiss

#### CHAPTER 15

- Description The Ever-Living Tree: The Life and Times of a Coast Redwood by Linda Vieira and Christopher Canyon
- Redwoods by Jason Chin
- Redwoods, Hemlocks & Other Cone-Bearing Plants (Kingdom Classification) by Steve Parker
- *Mushroom (Life Cycle of a* . . .) by Angela Royston and Adrian Vigliano

#### CHAPTER 16

- Cactus Desert (One Small Square) by Donald Silver and Patricia Wynne
- Gactuses (Rookie Read-About Science) by Allan Fowler
- Desert Giant: The World of the Saguaro Cactus (Tree Tales) by Barbara Bash

## CHAPTER 17

- Gactus Cafe: A Story of the Sonoran Desert by Kathleen Weidner Zoehfeld and Paul Mirocha
- *Mojave* by Diane Siebert and Wendell Minor
- Description The Mojave Desert (Deserts Around the World) by Molly Aloian
- Explore the Desert (Explore the Biomes) by Kay Jackson

## CHAPTER 18

- A Wetland Habitat (Introducing Habitats) by Molly Aloian and Bobbie Kalman
- What Are Wetlands? (Science of Living Things) by Bobbie Kalman and Amanda Bishop
- Swamp by Donald Silver and Patricia Wynne
- Life in a Swamp: A Wetlands Habitat (Real Life Readers) by Vivian Marais
- The Sea, the Storm, and the Mangrove Tangle by Lynne Cherry

# **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 done my best to include links to view the slides online, when possible so that purchasing a microscope is not absolutely necessary for this course. However, this course does afford a lot of opportunities for students to practice making their own slides and to become comfortable with using a microscope. 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:

- $\blacksquare$  A compound monocular microscope;
- $\square$  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 fluorescent bulb. Do not get one with mirror illumination.*)

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

1 http://www.microscope-microscope.org/basic/how-to-use-a-microscope.htm

For most of the microscope assignments, you will be making your own slides. If you don't know how to prepare a slide, check out the following post for more information on how to make your own dry and wet mount slides.

1 http://elementalblogging.com/using-microscope-for-homeschool-science/

# **DEMONSTRATION SUPPLIES LISTED BY CHAPTER**

## CHAPTER 1: FIND YOUR HABITAT

No supplies needed.

## CHAPTER 2: FERN OBSERVATION

Fern Frond Magnifying Glass

#### CHAPTER 3: FUNGUS WALK Magnifying Glass Gloves

## CHAPTER 4: ROSE DISSECTION

Rose Magnifying glass Knife

#### CHAPTER 5: MOSS HUNT

Magnifying glass Putty knife

## CHAPTER 6: EROSION PREVENTION

Dirt A 2" by 2" square of sod 2 Aluminum pans Water

## CHAPTER 7: SEED INVESTIGATION

Several pieces of fruit Knife Magnifying glass

## CHAPTER 8: INSECT TRAP

Cup Apple cider vinegar Liquid dish soap

## CHAPTER 9: GROWING MOLD

*Ripe piece of fruit Plastic container with a lid* 

## CHAPTER 10: BULB DISSECTION

Bulb Knife Magnifying glass

CHAPTER 11: LICHEN HUNT Magnifying glass Putty knife CHAPTER 12: MODEL PLANT CELL

Jell-O Green jelly beans Grapes A banana slice A small ziploc bag A small square plastic container

#### CHAPTER 13: LEAF CHANGE

Paper clips Foil Small house plant

#### CHAPTER 14: INSIDE THE CONE *Pine cone (tightly closed)*

Magnifying glass

#### Chapter 15: Mushroom Hunt

Magnifying glass Plastic spoon

## CHAPTER 16: CACTUS SHADOW

Sponge Flashlight 10 Toothpicks Shallow dish

## CHAPTER 17: WAXY LEAVES

Construction paper Crayon 2 Straws 2 Coffee stirrers Tape Shallow dish Modeling clay Board Permanent marker

#### CHAPTER 18: WETLAND FILTER

Small aluminum pan 1 Brick of floral foam 2 Pencils Spoon Soil, dirt, or sand Cup Water

# **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.

#### CHAPTER 1

No supplies needed.

#### CHAPTER 2

Organza fabric Green and gold wire Microscope slide Fern spores

#### CHAPTER 3

Peace lily Microscope slide Mushroom or other type of fungus

#### CHAPTER 4

Tissue paper Green pipe cleaners Double-sided tape Cardboard boxes Green spray paint Microscope slide Pollen

#### CHAPTER 5

Moss Yogurt Water Sugar Brick Paintbrush Microscope slide

## CHAPTER 6

Grass seed Dirt Pantyhose Googly eyes Felt Small pot Microscope slide Blade of grass

#### CHAPTER 7

Paper Pair of Tube-socks Herb-growing kit or herb cutting Microscope slide Several seeds

#### CHAPTER 8

Green pipe cleaner Green construction paper Brown beads Thin dowel rod

## CHAPTER 9

Slice of bread Plastic baggie Air-dry clay

#### CHAPTER 10

Garlic clove Plastic baggie Microscope slide Bulb skin

#### CHAPTER 11

Microscope slide Pond water

#### CHAPTER 12

Baking soda Water Cup Test Tube Elodea Leaves Paper Crayons

## CHAPTER 13

Nuts with shells Paper Crayons Microscope slide Apple slice

## CHAPTER 14

String Peanut butter Bird seed Microscope slide Pine needle

## CHAPTER 15

Microscope slide Mushroom

## CHAPTER 16

Microscope slide Cactus skin or spine

## CHAPTER 17

Shallow dish Sand Rocks Succulent plants Air-dry clay Toothpicks Canned cactus

## CHAPTER 18

No supplies needed.

# THE SASSAFRAS GUIDE TO THE CHARACTERS FOUND IN VOLUME 3: BOTANY

## Throughout the Book\*

- ★ Blaine Sassafras The male Sassafras twin, also known as Train. He started the summer hating science, but thanks to the zip lines, he is enjoying experiencing science face-to-face.
- ★ **Tracey Sassafras** The female Sassafras twin, also known as Blaisey. She started the summer hating science, but thanks to the zip lines, she is also enjoying experiencing science face-to-face.
- ★ Uncle Cecil The Sassafras twins' crazy, forgetful, and messy uncle. He is the scientist behind the invisible zip lines.
- ★ President Lincoln Uncle Cecil's lab assistant, who also happens to be a prairie dog. He is also the co-inventor of the zip lines.
- ★ **The Man with No Eyebrows** He has no eyebrows and an extreme dislike of Uncle Cecil. Not only is he spying on the red-haired scientist, but he is also trying to sabotage the twins at every stop.

(\*NOTE – These characters also appeared in The Sassafras Science Adventures Volume 1: Zoology and The Sassafras Science Adventures Volume 2: Anatomy.)

## CECIL'S NEIGHBORHOOD (CHAPTER 1)

\* Mrs. Pascapli (paz-kah-pah-LEE) – She lives at 1106 North Pecan Street, next door to Uncle Cecil.

## PERU (CHAPTERS 2 & 3)

- ★ Arrio The native Peruvian who serves as the local expert for the twins in the Amazon Rainforest. He is a full-fledged Yora tribesman and friend of Alvaro. He also appeared in *The Sassafras Science Adventures Volume 1: Zoology*.
- \* Itotia The leader of the Matsigenka tribe, who are the enemies of the Yora.
- ★ **Tenyoa** A tracker with the Yora tribe.
- ★ Alvaro Manihuari The owner of the Out-on-a-Limb guesthouse. He is a friend of Arrio and the Yora tribesman. He also appeared in *The Sassafras Science Adventures Volume 1: Zoology*.
- Ernesto Perez The president of the ProLog operations in Peru. He also appeared in *The Sassafras Science Adventures Volume 1: Zoology*.

## SCOTLAND (CHAPTERS 4 & 5)

- ★ **Fiona McRay** The resident botanist at Dockerty Castle. She is also the twins' local expert as they explore the Scottish castle's gardens and nearby peat bog.
- ★ **Dunmore** The butler at Dockerty Castle.
- ★ **Osla** The maid at Dockerty Castle.
- **Rona** The baker at Dockerty Castle.
- \* Angus The gardener at Dockerty Castle.
- ★ Lief The piper at Dockerty Castle.
- **Lady Dockerty** The mistress of Dockerty Castle.
- ★ Sir Kentalot Lady Dockerty's brother.
- Miles Dockerty Lady Dockerty's son and judge of the Take Our Breath Away singing competition. He also appeared in *The Sassafras Science Adventures Volume 2: Anatomy.*

## ARGENTINA (CHAPTERS 6 & 7)

★ **Felipe Moreno** – The entertainer and pianist at the Cantina de Pampas. He is the local expert as the twins explore the Argentinian pampas.

- ★ Emilio The bartender at the Cantina de Pampas.
- ★ Raul Juan Pablo Eduardo Santiago Mateo De La Casillas . . . the third The gaucho with ten names who is on a quest to discover who killed his gray fox.
- **Darts Domingo** The rough darts player who challenges the gaucho with ten names on his quest.
- ★ Jorge Alfonzo A trapper on the pampas who confronts the gaucho with ten names on his quest.
- ★ Franco Lorenzo An Argentinian cattle wrangler who tests the gaucho with ten names on his quest.
- ★ **Manuel Hernandez** The owner of the Hacienda de Hernandez, a white mansion in the middle of the Argentinian pampas.
- \* Nicolette Hernandez The wife of Manuel Hernandez.

## BORNEO (CHAPTERS 8 & 9)

- \* Trisno Kanang The twins' local expert in Borneo. He works at Pitchers Beachside Resort.
- \* Novi Anita The hotel manager at Pitchers Beachside Resort.
- ★ Rover and Zaza Ridgeburn A couple who have come to celebrate their fiftieth anniversary at the Pitchers Beachside Resort.
- \* **Rama** The leader of the pirates who attack the Pitchers Beachside Resort.

## SIBERIA (CHAPTERS 10 & 11)

- ★ **Pavel Markoff** The engineer of the secret Siberian Railway train. He is the twins' local expert as they journey through the Siberian tundra.
- \* Yuri Checkoff The conductor of the secret Siberian Railway train.
- \* Yuroslav Bogdanovich The Aggrandizer inventor and crazed Siberian scientist.
- ★ Sveta Corvette The neon green punk-rocker who travels the trains as a stowaway.

## FRANCE (CHAPTERS 12 & 13)

★ Été Plage – The mysterious local expert during the twins' visit to France. They have met her multiple times in their adventures, but they usually find her in a much colder place.

## NORTHERN CALIFORNIA (CHAPTERS 14 & 15)

- ★ **Brock Hoverbreck** The twins' local expert as they explore the redwoods of Northern California. He is a park ranger and expert of the flora there.
- ★ Melody Albermully The leader of the C.O.M. Crew.
- **Harmony Albermully** Melody's sister and the C.O.M. Crew historian.
- ★ **Rip** The tracker for the C.O.M. Crew.
- ★ **Sam** The tech specialist for the C.O.M. Crew.
- Chorus (a.k.a. Cory) Albermully The technical assistant to Sam, and brother of Melody and Harmony.
- ★ **Ned** The driver for the C.O.M. Crew.

## SOUTHERN CALIFORNIA (CHAPTERS 16 & 17)

★ Symphony Douglas – The twins' local expert as they explore the Mojave Desert of Southern California. She is a park ranger at Joshua Tree National Park and cousin of Brock Hoverbreck.

# **CHAPTER 1: THE BASICS OF BOTANY**

#### CHAPTER SUMMARY

The chapter opens with Tracey recalling snippets of their zoology and anatomy legs. She then joins Blaine and heads inside to watch President Lincoln's anatomy review video. Uncle Cecil suggests a walk through the neighborhood to introduce botany. The twins learn more about the plant kingdom and the Sassafras tree before they are chased by a dog back to Cecil's house. They open up their LINLOC app and zip to their first botany location at the end of the chapter. We also learn that the Man with No Eyebrows has indeed stolen Phil Earp's Dark Cape suit and he intends to use it to stop the twins on their journey.

#### SUPPLIES NEEDED

Experiment	Projects and Activities
No Supplies Needed	No Supplies Needed

## OPTIONAL SCHEDULES FOR TWO-DAYS-A-WEEK

Day 1	Day 2
□ Read Chapter 1 in SSA* Volume 3: Botany.	□ Read the assigned pages from the encyclopedia of your
□ Set up your students' SCIDAT logbook.	choice; write narration on the Botany Notes Sheet on SL pg. 12.
☐ Go over the vocabulary words and enter it into the Botany Glossary on SL** pg. 89.	<ul> <li>Read one of the additional living books from your library; write narration on the Botany Notes Sheet on</li> </ul>
□ Do the demo <sup>***</sup> entitled "Find your Habitat"; write observations on SL pg. 11.	SL pg. 12.
observations on SL pg. 11.	Do the copywork or dictation assignment and add it to the Botany Notes sheet on SL pg. 12.
	□ Play a game of "I Spy".

## Optional Schedule for Five-Days-A-Week

Day 1	Day 2	Day 3	Day 4	Day 5
<ul> <li>Read the section entitled "Memories on the Horse Swing" of Chapter 1 in SSA Volume 3: Botany.</li> <li>Set up your students' SCIDAT logbook.</li> </ul>	<ul> <li>Read the section entitled "Next Up—The Study of Plants" of Chapter 1 in SSA Volume 3: Botany.</li> <li>Do the demo entitled "Find your Habitat"; write observations on SL pg. 11.</li> </ul>	□ Read the assigned pages from the encyclopedia of your choice; write narration on the Botany Notes Sheet on SL pg. 12.	<ul> <li>Read one of the additional library books.</li> <li>Go over the vocabulary word and enter it into the Botany Glossary on SL pg. 89.</li> </ul>	<ul> <li>Do the copywork or dictation assignment and add it to the Botany Notes sheet on SL pg. 12.</li> <li>Play a game of "I Spy".</li> </ul>

\*SSA = The Sassafras Science Adventures

\*\*SL = The Official Sassafras SCIDAT Logbook: Botany Edition \*\*\*demo = Scientific Demonstration

## SCIENCE-ORIENTED BOOKS

## LIVING BOOK SPINE

Chapter 1 of *The Sassafras Science Adventures Volume* 3: Botany

## OPTIONAL ENCYCLOPEDIA READINGS

- *Q* DK First Nature Encyclopedia pp. 6–7 (World Habitats)
- V Usborne Internet-linked Science Encyclopedia pp. 330-331 (Ecology)
- Kingfisher Science Encyclopedia pp. 68–69 (Biomes and Habitats)
- P DK Encyclopedia of Nature pp. 62-63 (Ecology)

## Additional Living Books

- Many Biomes, One Earth by Sneed B. Collard III
- What Is a Biome? (Science of Living Things) by Bobbie Kalman
- Earth's Biomes (Sci-Hi: Life Science) by Donna Latham and Adam Miller
- Green Genius Guide: What are Ecosystems, Biomes, Ecotones, and more... by Richa Sharma

## NOTEBOOKING (SCIDAT LOGBOOK INFORMATION)

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

## INFORMATION SHEETS

The purpose of these sheets is for the students to record what they have learned about the various divisions of the plant kingdom studied in *The Sassafras Science Adventures Volume 3: Botany.* These sheets will be added to throughout the book.

EXAMPLES- The students will enter the names of different plants (or fungi) they encounter that fall into that division.

CHARACTERISTICS – The students should record the characteristics of the plants (or fungi) that they have learned about in the division.

#### **BIOME SHEETS**

The purpose of these sheets is to give the students an opportunity to work on their mapping skills as they study the different biomes around the world.

BIOME – The students will color and label the biome that the twins visited.

MAP – The students will color the areas of the map where the particular biome can be found.

FACTS ABOUT – Have the students enter any interesting information they have learned about the area, such as the typical weather and any animals or plants that are found there.

#### BOTANY RECORD SHEETS

The purpose of these sheets is for the students to record what they have learned about the various plants that are introduced in *The Sassafras Science Adventures Volume 3: Botany*.

DIVISION – The students should enter the division into which the plant is a classified. They can also enter the plant name on the overview sheet at the same time.



PREFERRED HABITAT – The students should describe the habitat preferred by that particular plant. DISTRIBUTION – The students should write where the plant can be found.

**INFORMATION LEARNED** – The students should enter any information that they have learned about the particular plant.

#### BOTANY NOTES SHEETS

The purpose of these sheets is for the students to record any additional information that they have learned during their study of botany. 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 botany.

## BOTANY 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 3: Botany*. They can look up each term in a science encyclopedia or in the glossary included on pp. 131-133 of this guide. Then, have the students copy each definition onto a blank index card or into their SCIDAT logbook. They should also illustrate each of the vocabulary words. (NOTE – *In The Official Sassafras Student SCIDAT Logbook: Botany Edition these pictures are already provided.*) This week, have the students look up the following term:

BIOME – A community of living things, both plants and animals, which are affected by the climatic conditions of the region in which they are found.

For each of these sheets, you can have the students enter information only from *The Sassafras Science Adventures Volume 3: Botany*, 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: FIND YOUR HABITAT

Begin by taking a moment to discuss the difference between a habitat (which you covered in zoology) and a biome. You can also discuss how important observation skills are for the scientist who is studying a particular biome. You can view the following blog posts for more information on the subject.

- 1 http://elementalblogging.com/homeschool-science-corner-habitat-vs-biome/
- 1 http://elementalscience.com/blogs/news/63858627-observation-is-key

Explain that today you are going to practice your observation skills while finding out what type of habitat you live in. Then, take a walk in your neighborhood or on a nearby nature trail. Allow the students to make observations and ask questions. Ask the students:

- ⇒ What kinds of plants do you see?
- ⇒ What kinds of animals do you see?
- ⇒ What is the weather like today?
- ⇒ What is the weather usually like in the different seasons?

Allow the students to observe the environment, find clues from there, and then use those clues to determine the habitat they are in. You can record their answers on the sheet provided in the SCIDAT Logbook.

## MULTI-WEEK PROJECTS AND ACTIVITIES

## MULTI-WEEK PROJECTS

Some POSTERS – Over the coming weeks, you can have the students create a poster for each of the biomes they study. Each will include a picture of the biome and a few facts about it. This week, have the students decide if they want to make these posters on their own, create a picture collage, or use the biome posters found in the Appendix on pp. 109-115 as templates. You will begin actually making the posters next week.

## ACTIVITIES FOR THIS WEEK

> I SPY – Play a game of "I Spy" to help the students work on their observation skills.

## MEMORIZATION

## COPYWORK/DICTATION

#### **COPYWORK SELECTION**

A habitat is the local surroundings. A biome is a larger global ecosystem.

#### TICTATION PASSAGE (Major Biomes Poem)

Deserts are dry and dusty places, Hot all day, so water is scarce in these spaces. The grassland is a prairie or pasture, There are few trees, and much grass for the horse and rancher. The forest is full of different trees, It has distinct layers that let plants grow with ease. The arctic is a cold and icy land, The ground is forever frozen and the landscape is bland.

## NOTES

# **CHAPTER 2: RETURN TO THE JUNGLE**

#### CHAPTER SUMMARY

The chapter opens with Blaine and Tracey landing in the treetops of the Amazon jungle. As they race to the forest floor, Blaine gets stuck in a vine. Their old friend, Arrio, from their zoology leg appears out of the forest just in time to help the twins. He cuts Blaine down as he shares about the orchids that can be found in the rainforest. On the way back to his village, he teaches the Sassafras twins about ferns. Once they arrive, the Yora tribesmen welcome Blaine and Tracey in. Around the camp-fire that evening, Arrio tells them a few of the Yora legends, including the one about the Huaca Sun temple. The chapter ends with us finding out that the Man with No Eyebrows has also arrived in the Amazon.

## SUPPLIES NEEDED

Experiment	Projects and Activities
• Fern Frond	• Organza fabric, Green and gold wire
Magnifying Glass	• Microscope slide, Fern spores

Day 1	Day 2			
Read the section entitled "Falling Orchids" of Chapter 2 in SSA Volume 3: Botany.	<ul> <li>Read the section entitled "Fishing for Ferns" of Chapter</li> <li>2 in SSA Volume 3: Botany.</li> </ul>			
□ Fill out a Botany Record Sheet on SL pg. 14 for the	□ Fill out a Botany Record Sheet on SL pg. 15 for the fern.			
orchid.  Add facts to the Flowering Plants Information Sheet	Add facts to the Non-flowering Plants Information on SL pg. 8.			
on SL pg. 5; Add facts to the Biome Sheet on SL pg. 13 for the rainforest.	Do the demo entitled "Fern Observation"; write information learned on SL pg. 18.			
☐ Go over the vocabulary words and enter them into the Botany Glossary on SL pg. 89.	Do the copywork or dictation assignment and add it to the Botany Notes on SL pg. 18.			
□ Choose one of the activities for this week to do.	□ Work on one or all of the multi-week activities.			

## Optional Schedule for Two-Days-A-Week

## Optional Schedule for Five-Days-A-Week

Day 1	Day 2	Day 3	Day 4	Day 5
<ul> <li>Read the section entitled "Falling Orchids" of Chapter 2 in SSA Volume 3: Botany.</li> <li>Fill out a Botany Record Sheet on SL pg. 14 for the orchid.</li> </ul>	<ul> <li>Read the section entitled "Fishing for Ferns" of Chapter 2 in SSA Volume 3: Botany.</li> <li>Fill out a Botany Record Sheet on SL pg. 15 for the fern.</li> </ul>	<ul> <li>Read one or all of the assigned pages from the encyclopedia of your choice; write narration on the Botany Notes Sheet on SL pg. 18.</li> </ul>	<ul> <li>Read one of the additional library books.</li> <li>Go over the vocabulary words and enter them into the Botany Glossary on SL pp. 89.</li> </ul>	<ul> <li>Do the copywork or dictation assignment and add it to the Botany Notes sheet on SL pg. 18.</li> <li>Work on one or the final distribution of the final distri</li></ul>
<ul> <li>Add facts to the Flowering Plants Information Sheet on SL pg. 5; Add facts to the Biome Sheet on SL pg. 13.</li> </ul>	<ul> <li>Add facts to the Non- flowering Plants Information on SL pg. 8.</li> </ul>	<ul> <li>Do the demo entitled "Fern Observation"; write information learned on SL pg. 18.</li> </ul>	□ Choose one of the activities for the week to do; fill out the project record sheet on pg. 20.	all of the multi- week activities.

## SCIENCE-ORIENTED BOOKS

## LIVING BOOK SPINE

Chapter 2 of *The Sassafras Science Adventures Volume* 3: Botany

## OPTIONAL ENCYCLOPEDIA READINGS

- OK First Nature Encyclopedia pp. 32–33 (In the Treetops)
- Vsborne Internet-linked Science Encyclopedia pg. 283 (Flowerless Plants)
- Kingfisher Science Encyclopedia pp. 438-439 (Saving the Rainforest)
- OK Encyclopedia of Nature pp. 82–83 (Tropical Rainforests), pp. 122–123 (Ferns and Horsetails)

## Additional Living Books

- Greater of the control of the contro
- Description: The Great Kapok Tree: A Tale of the Amazon Rainforest by Lynne Cherry
- A Rainforest Habitat (Introducing Habitats) by Molly Aloian and Bobby Kalman

## NOTEBOOKING (SCIDAT LOGBOOK INFORMATION)

This week, you can have the students begin to fill out the Information Sheets for flowering plants and nonflowering plants. They can also fill out the biome sheet for the rainforest and the logbook sheets for the orchid and the fern. Here's the information they could include:

## INFORMATION SHEETS

FLOWERING PLANTS – The students can add the orchid to the "Examples" box. They can also add the following information to the "Characteristics" box:

⇒ These plants use flowers in reproduction.

NON-FLOWERING PLANTS – The students can add the fern to the "Examples" box. They can also add the following information to the "Characteristics" box: ⇒ *These plants use spores in reproduction.* 

## BIOME SHEETS

BIOME – Have the students color and label the layers of the rainforest biome—the forest floor, the shrub layer, the understory, the canopy, and the emergent leaves.

FACTS ABOUT – Have the students enter any interesting information they have learned about the area, such as the typical weather and any animals or plants that are found there. This week, the students could include the following:

⇒ Rainforests are found all over the world, but the largest one is in the Amazon.

## BOTANY RECORD SHEETS

ORCHID DIVISION – Flowering Plants PREFERRED HABITAT – Rainforest DISTRIBUTION – Worldwide INFORMATION LEARNED ⇔ Orchids are epiphytes that sprout and grow on the branches of trees.





- $\Rightarrow$  They receive more light on the branch than they would on the forest floor.
- ⇒ They get the water and nutrients they need from the air and rain that comes down through the canopy.
- $\Rightarrow$  Generally, they do not harm the plant that they are attached to.
- ⇒ There are over twenty thousand orchid species in the Amazon Rainforest and they are known for their fragrance and beauty.
- ⇒ Orchids can survive with little water and their seeds are carried throughout the rainforest by the wind.
- ⇒ In the rainforest, orchids typically attach themselves to trees and their roots remain exposed to collect as much water and nutrients as they can.
- ⇒ The Cattleya orchid has a thickened bulb at the base of the stem and wide fleshy leaves; both store food and water.

## Fern

DIVISION – Simple Plants PREFERRED HABITAT – Woodlands and rainforests DISTRIBUTION – Worldwide

## INFORMATION LEARNED

- ⇒ Ferns are non-flowering plants that grow in damp or shady places, like humid forests or river banks.
- ⇒ Their roots are typically small and do not go deep into the soil.
- $\Rightarrow$  They have delicate, tapered leaves, called fronds, which unfurl as they grow.
- ⇒ They have rigid stalks that transport nutrients, but they do not flower; instead, they release spores.
- ⇒ Spores are microscopic particles of living material encased in a tough coating; they can reproduce a plant. They develop in sacs, called sori, on the underside of the fern fronds. When the spores mature, they are released by the thousands into the air.
- ⇒ In the Amazon Rainforest, ferns can grow on the forest floor or in trees.
- ⇒ Epiphytic ferns, such as the filmy fern, can take root in the boughs or trunks of a tree. They can absorb nutrients from dead insects, leaves, and droppings that accumulate around their roots.

## VOCABULARY

Have the older students look up the following terms in the glossary in the Appendix on pp. 131-133 or in a science encyclopedia. Then, have them copy each definition onto a blank index card or into their SCIDAT logbook.

- EPIPHYTE A plant, such as a moss or an orchid, that can sprout and grow on the branches of a tree.
- SPORE A microscopic package of cells produced by a fungus or plant; it can grow into a new individual.

## SCIENTIFIC DEMONSTRATION: FERN OBSERVATION

## MATERIALS

☑ Fern leaf

## ☑ Magnifying glass

## PROCEDURE

- 1. Have the students observe a fern frond. (NOTE You can purchase one from the local florist or look for a fern plant while on a nature walk.)
- 2. Have them observe the stalk and fronds with and without a magnifying glass. If you have access to a microscope, have the students look at the leaves up close.
- 3. Have the students look, feel, and smell the leaf as they make observations. Have them also look for



evidence of spores.

## Explanation

The students should spend time observing the fern leaf, looking for the different things they learned about in the novel. If they looked at the fern under a microscope, they should have seen layers of plant cells.

## TAKE IT FURTHER

Have the students take a walk in your local woods to look for ferns. Once they find some, have them observe the ferns to see how they are alike and how they differ from the ones they observed during the demonstration.

## MULTI-WEEK PROJECTS AND ACTIVITIES

## MULTI-WEEK PROJECTS

Solution POSTERS – This week, have the students begin their rainforest biome poster. (*A template can be found on Appendix pg. 109.*) They can color the background, add one interesting fact about the rainforest, and glue the orchid to one of the tree branches and fern pictures to the rainforest floor. (*Small pictures can be found on Appendix pg. 116.*)

## ACTIVITIES FOR THIS WEEK

X MAKE YOUR OWN ORCHID – Have the students make their own bunch of orchid blooms. You will need some light fabric (such as organza) as well as gold and green wire. Visit the following website for directions for this project:

1 http://www.pitara.com/activities/craft/online.asp?story=66

**FERN LIFE CYCLE** – Have the students learn more about the fern life cycle. You can have them read from the scheduled pages in the Encyclopedia of Nature or from this website:

1 http://botany.thismia.com/2009/12/02/fern-life-cycle/

Once they are done, they can fill out the blank fern life cycle sheet found in the Appendix on pg. 119. I have also included a completed version on pg. 120 for your younger students.

℅ MICROSCOPE WORK – Have the students look at the spores under a microscope. They can do this by collecting a few of the spores with a Q-tip from the fern they used for the demonstration. Then, have them wipe those spores on a clean, blank slide and view the slide under the microscope. Have the students complete one of the microscope worksheets found on pp. 107-108 of the Appendix. If you do not own a microscope, view the following You Tube video from Matin Microscope about fern spores:

<sup>1</sup> <u>http://www.youtube.com/user/MartinMicroscope#p/a/u/1/5hGQcmM6njY</u>

## MEMORIZATION

## COPYWORK/DICTATION

COPYWORK SENTENCE

Ferns are simple plants.

DICTATION SELECTION

The rainforest has five layers—the forest floor, the shrub layer, the understory, the canopy, and the emergent leaves. Rainforests are found all over the world, but the largest one is in the Amazon. You can find orchids and ferns in the Amazon rainforest.

## NOTES

# **CHAPTER 3: KIDNAPPED**

## CHAPTER SUMMARY

The chapter opens with Tracey being kidnapped from the Yora hut in the middle of the night by the leader of the Matsigenka, which foils the plans of the Man with No Eyebrows. Arrio wakes up Blaine and they quickly race after her. On the way, Blaine gets caught in a trap. As Arrio works to free the Sassafras boy, he tells Blaine about the peace lilies that are surrounding them. Meanwhile, Tracey and her captors end up at the site of the Huaca Sun temple, where she recognizes Ernesto and Alvaro from her zoology leg. A fight almost ensues between the Matsigenka and Ernesto's men, but Tracey and Alvaro step in. As part of the solution, the crew of outsiders is tied up while the natives open the temple to find the legendary staff. The Matsigenka succeed and run off. The chapter ends with Arrio, Blaine, and the rest of the Yora rescuing the tied-up adventurers just as Alvaro is telling Tracey about shelf fungus.

Experiment Projects and Activities				
• Magnifying glass	• Peace lily			
• Gloves	• Microscope slide, Mushroom or other type of fungus			

## SUPPLIES NEEDED

Optional	SCHEDULE	for Two	-Days-A-Week
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Day 1		Day 2
	Read the section entitled "Lilies on the Trail" of Chapter 3 in SSA Volume 3: Botany.	Read the section entitled "Fighting Fungi" of Chapter 3 in <i>SSA Volume 3: Botany.</i>
	Fill out a Botany Record Sheet on SL pg. 16 for the peace lily.	Fill out a Botany Record Sheet on SL pg. 17 for the fungus; Add facts to the Fungi and Molds Information on SL pg. 9.
	Add facts to the Flowering Plants Information Sheet on SL pg. 5; Add facts to the Biome Sheet on SL pg. 13 for the rainforest.	Do the demo entitled "Fungus Walk"; write information learned on SL pg. 19.
	Go over the vocabulary word and enter it into the Botany Glossary on SL pg. 89.	Do the copywork or dictation assignment and add it to the Botany Notes on SL pg. 19.
	Choose one of the activities for this week to do.	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> <li>Read the section entitled "Lilies on the Trail" of Chapt 3 in SSA Volume 3: Botany.</li> <li>Fill out a Botany Record Sheet on St pg. 16 for the peac lily.</li> </ul>	<ul> <li>3 in SSA Volume 3: Botany.</li> <li>□ Fill out a Botany Record Sheet on SL pg. 17 for the fungus.</li> </ul>	your choice; write narration on the Botany Notes Sheet on SL pg. 19.	<ul> <li>Read one of the additional library books.</li> <li>Go over the vocabulary word and enter it into the Botany Glossary on SL pp. 89.</li> </ul>	<ul> <li>Do the copywork or dictation assignment and add it to the Botany Notes sheet on SL pg. 19.</li> <li>Go over the vocabulary word and antar it</li> </ul>
□ Add facts to the Flowering Plants Information Sheet on SL pg. 5; Add facts to the Biome Sheet on SL pg. 13	□ Add facts to the Fungi and Molds Information on SL pg. 9.	<ul> <li>Do the demo entitled "Fern Observation"; write information learned on SL pg. 19.</li> </ul>	□ Choose one of the activities for the week to do; fill out the project record sheet on pg. 21.	and enter it into the Botany Glossary on SL pp. 89. □ Work on one or all of the multi- week activities.