The Sassafras Guide to Astronomy

Written by Paige Hudson

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The Sassafras Guide to Astronomy

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The Sassafras Guide to Astronomy 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 6: Astronomy*. Then they write about what they have learned and complete a related scientific demonstration or hands-on project. If 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 astronomy.

Each of the chapters in this guide corresponds directly with the chapters in *The Sassafras Science Adventures Volume 6: Astronomy.* 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 the planets, the stars, and more. So pick and choose what you know you and your students will enjoy!

What Each Chapter Contains

Each chapter begins with two schedule sheets for the corresponding chapter in *The Sassafras Science Adventures Volume 6: Astronomy.* On the schedule sheets, you will find a chapter summary, plus 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 laid out as a four-day grid schedule and one laid out as a list to check off. 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 scheduling 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

ⓘ **Chapter Assignment** – This section contains the corresponding chapter in *The Sassafras Science Adventures Volume 6: Astronomy.*

Encyclopedia Readings – This section contains possible reading assignments from:

- 🕮 *Basher Science Astronomy* (best for 1st through 2nd grades)
- 🕮 *Usborne Children's Encyclopedia* (best for 2nd through 4th grades)
- 🕮 *DK First Space Encyclopedia* (best for 2nd through 4th grades)
- 🕮 *Kingfisher Science Encyclopedia* (best for 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 astronomical information the students could include on their astronomy 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? – https://elementalscience.com/blogs/news/what-is-notebooking
- How to use notebooking with different ages – https://elementalscience.com/blogs/news/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: Astronomy 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. 132-133 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 astronomy. 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: Astronomy 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 Astronomy*. 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 astronomy with the Sassafras twins.

Book List

Main Text

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

- *The Sassafras Science Adventures Volume 6: Astronomy*

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 Astronomy* (best for 1st through 2nd grades)
- *Usborne Children's Encyclopedia* (best for 2nd through 4th grades)
- *DK First Space Encyclopedia* (best for 2nd through 4th grades)
- *Kingfisher Science Encyclopedia* (best for grades 4th through 6th grades)

You may want to consider purchasing the following resource for your night sky spotting to use for the remainder of your astronomy studies:

- *100 Things to Spot in the Night Sky (Spotter's guides) Cards*

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 astronomy.

- *The Official Sassafras Student SCIDAT Logbook: Astronomy 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-6-links/

Additional Living Books Listed By Chapter

Chapter 1

- *A Cat's Guide to the Night Sky* by Stuart Atkinson and Brendan Kearney
- *Space: A Visual Encyclopedia* by DK

Chapter 2

- *There's No Place Like Space: All About Our Solar System (Cat in the Hat's Learning Library)* by Tish Rabe and Aristides Ruiz
- *Scholastic Reader Level 2: Solar System* by Gregory Vogt
- *Magic School Bus Out of This World : A Book about Space Rocks* by Joanna Cole and Bruce Degen

Chapter 3

- *The Sky Is Full of Stars (Let's-Read-and-Find-Out Science 2)* by Franklyn M. Branley and Felicia Bond
- *Jump Into Science: Stars* by Steve Tomecek
- *Stars! Stars! Stars!* by Bob Barner
- *If You Were a Kid Docking at the International Space Station (If You Were a Kid)* by Josh Gregory and Jason Raish

Demonstration Supplies Listed By Chapter

Chapter 1: Observing the Night Sky

No supplies needed

Chapter 2: Impact

Marbles
Aluminum pan
Cornstarch
Cocoa Powder
Tape measure

Chapter 3: Shining Stars

Black construction paper
Toothpick
Tape
Flashlight
Large clear bowl
Water

Chapter 4: Trapped Heat

2 Thermometers
Cutting board
Clear glass bowl

Chapter 5: Solar Rover

A solar-powered mini-car kit
(OR a DC motor, Solar panel with wires, 2 Sets of wheels with axles or steel wires, Cardboard, Hot glue, Plastic tubing)

Chapter 6: Stormy Swirls

Bowl
Milk
Food Coloring
Liquid soap
Toothpick

Chapter 7: Planetary Orbit

Marble
Smooth pie plate or cake pan

Chapter 8: Magnify

Glass bowl
Cooking oil
Piece of paper with words on it
Magnifying glass

Chapter 9: Reflection Direction

Small mirror
Small flashlight
A dark room

Chapter 10: Solar S'mores

Large marshmallows
Chocolate squares
Graham crackers
Foil
Cardboard box
Plastic wrap

Chapter 11: Moon Cookies

8 Sandwich-style cookies
Picture of the phases of the moon (*Template is found on Appendix pg. 131.*)

Chapter 12: Space Tasks

Thick yellow rubber gloves or work gloves
LEGO bricks
Several bolts, washers, and nuts

Chapter 13: Simple Astrolabe

Thin wooden dowel or a straw
String (about 12" long)
Heavy metal nut or washer
Protractor
Tape

Chapter 14: Balloon Rocket

Straw
String (5 feet)
Scissors
Large balloon
2 Chairs
Tape

Chapter 15: Sucked In

Hard-boiled egg
Warm water
Bottle with large-mouth (i.e., sports drink bottle)
Access to a freezer

Chapter 16 And 17: Flashlight Planetarium

Foil
Toilet Paper Tube
Pin
Small flashlight
Constellation pictures (*Templates are found on Appendix pg. 134.*)
Rubber band
Sharpie marker

Chapter 18:

Planetary Bingo Cards (*Download these for free from Elemental Science.*)

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

Black construction paper (2-11"x 17" or 3-8 ½" x 11" sheets)
Clear gel glue, Water, Silver glitter, Black (or purple) food coloring, Plastic baggie, Cup, Borax Laundry Booster

Chapter 2

Brown and yellow construction paper
Beads, String
Ice cream, Plastic baggie, Rolling pin, Cookies
Rocks, Black paint, Silver glitter

Chapter 3

Black construction paper, 2 Cotton balls, 1 Small yellow pom-pom, 1 Large red pom-pom, 1 Large white sequin

Chapter 4 to 7

Materials will vary based on the type of planet model you choose to make.

Chapter 8

White tissue paper or white chalk pastel
White chalk pastel or crayon, black construction paper, silver glitter

Chapter 9

Bottle caps, Toothpicks, Thin cardboard, A small juice box, Glittered blue decorative card stock, Gold and silver paint, 12x12-inch Foam piece, Aluminum foil, Glue, 1/4-inch Wooden dowel, Scissors, Pencil, Measuring tape (Or LEGO bricks)
Smartphone

Chapter 10

White glue, Food coloring, Toothpicks, Yogurt container lid, Hole punch, String
Colored pencils or magazine pictures

Chapter 11

Black poster board, White toothpaste or shaving cream, Butter knife, Tape, Wiffle ball 2 Sheets of paper, Scissors, Yellow and orange paint, Paintbrush

Chapter 12

Soda bottle, Cardstock, White and black paint, Glue
String, Small paper cup, Mini-marshmallows, Potential parachute material (paper, tissue, thin fabric, felt), Scissors or a hole punch

Chapter 13

3' Curling ribbon, Tennis ball, Foil, Straight pin

Chapter 14

Build-a-rocket kit

Chapter 15

Materials will vary based on the type of planet model you choose to make.
Plastic cup, Sharpie markers, Pan, Spray oil, Foil

Chapter 16

Marshmallows, Toothpicks
Gold star stickers, White crayon, Paper, Dark blue or black paint

Chapter 17

Materials will vary based on what you decided to do for your constellation party.

Chapter 18

Materials will vary based on what you decided to do for the alien craft.

Chapter Lessons

Chapter 1: Grid Schedule

Supplies Needed	
Demo	• No supplies needed
Projects	• Black construction paper (2-11"x 17" or 3-8 ½" x 11" sheets), Clear gel glue, Water, Silver glitter, Black (or purple) food coloring, Plastic baggie, Cup, Borax laundry booster

Chapter Summary

The chapter opens with a dilemma: Uncle Cecil must risk going into Old Man Grusher's backyard, possibly facing off with his Guardian Beast, in order to retrieve the petri dish, otherwise known as a frisbee, that landed there during a game of Pass the Petri. After several pep talks, he finally makes it over the fence with the help of Blaine and Tracey. They meet Old Man Grusher and learn that he is not as bad as they thought before heading back to Cecil's basement lab where the twins get to hear President Lincoln's ever-so-brief presentation on geology. We learn that the next leg of the twin's journey is Astronomy, and Summer is going to be their local expert. Before the chapter closes, we also learn that the Man With No Eyebrows has not given up; in fact, he has a whole army of scientists helping him now, thanks to Adrienne Archer, the rough Swiss Secret Service agent!

Weekly Schedule

	Day 1	Day 2	Day 3	Day 4
Read	☐ Read the section entitled "Pass the Petri Gone Wrong" of Chapter 1 in *SSA* Volume 6: Astronomy.*.	☐ (*Optional)* Read one or all of the assigned pages from the encyclopedia of your choice.	☐ Read the section entitled "A Look Back at Geology" of Chapter 1 in *SSA Volume 6: Astronomy.*	☐ (*Optional)* Read one of the additional books from your library.
Write	☐ Set up your students' SCIDAT logbooks.	☐ (*Optional)* Write a narration on the Astronomy Notes Sheet on SL** pg. 5. ☐ Add information learned from the demonstration on SL pg. 5.	☐ Go over the vocabulary word and enter it into the Astronomy Glossary on SL pg. 91.	☐ (*Optional)* Complete the copywork or dictation assignment and add it to the Astronomy Notes sheet on SL pg. 6.
Do	☐ (*Optional)* Play a game of "I Spy."	☐ Do the demonstration entitled "Observing the Night Sky."	☐ (*Optional)* Make Night Sky Slime.	☐ Work on the Solar System model.

**SSA = The Sassafras Science Adventures*

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

Chapter 1: List schedule

Supplies Needed	
Demo	• No supplies needed
Projects	• Black construction paper (2-11"x 17" or 3-8 ½" x 11" sheets), Clear gel glue, Water, Silver glitter, Black (or purple) food coloring, Plastic baggie, Cup, Borax laundry booster

Chapter Summary

The chapter opens with a dilemma: Uncle Cecil must risk going into Old Man Grusher's backyard, possibly facing off with his Guardian Beast, in order to retrieve the petri dish, otherwise known as a frisbee, that landed there during a game of Pass the Petri. After several pep talks, he finally makes it over the fence with the help of Blaine and Tracey. They meet Old Man Grusher and learn that he is not as bad as they thought before heading back to Cecil's basement lab where the twins get to hear President Lincoln's ever-so-brief presentation on geology. We learn that the next leg of the twin's journey is Astronomy, and Summer is going to be their local expert. Before the chapter closes, we also learn that the Man With No Eyebrows has not given up; in fact, he has a whole army of scientists helping him now, thanks to Adrienne Archer, the rough Swiss Secret Service agent!

Essential To-Do's

Read

- ☐ Read the section entitled "Pass the Petri Gone Wrong" of Chapter 1 in *SSA* Volume 6: Astronomy.*
- ☐ Read the section entitled "A Look Back at Geology" of Chapter 1 in *SSA Volume 6: Astronomy.*

Write

- ☐ Set up your students' SCIDAT logbooks.
- ☐ Add information learned from the demonstration on SL** pg. 5.
- ☐ Go over the vocabulary word and enter it into the Astronomy Glossary on SL pg. 91.

Do

- ☐ Do the demonstration entitled "Observing the Night Sky."
- ☐ Work on the Solar System model.

Optional Extras

Read

- ☐ Read one or all of the assigned pages from the encyclopedia of your choice.
- ☐ Read one of the additional books from your library.

Write

- ☐ Write a narration on the Astronomy Notes Sheet on SL pg. 5.
- ☐ Complete the copywork or dictation assignment and add it to the Astronomy Notes sheet on SL pg. 6.

Do

- ☐ Play a game of "I Spy."
- ☐ Make Night Sky Slime.

**SSA = The Sassafras Science Adventures*
***SL = The Official Sassafras SCIDAT Logbook: Astronomy Edition*

Chapter 1: Time to Boldly Go Where...

Science-Oriented Books

Living Book Spine

📖 Chapter 1 of *The Sassafras Science Adventures Volume 6: Astronomy*

Optional Encyclopedia Readings

- *Basher Science Astronomy* pg. 4 (Introduction)
- *Usborne Children's Encyclopedia* pp. 246-247 (Amazing Space)
- *DK First Space Encyclopedia* pp. 4-5 (What is space?)
- *Kingfisher Science Encyclopedia* pg. 385 (Space and Time)

Additional Books

📖 *A Cat's Guide to the Night Sky* by Stuart Atkinson and Brendan Kearney
📖 *Space: A Visual Encyclopedia* by DK

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: Astronomy Edition* with all the pages and pictures from Elemental Science. Below is an explanation of each of the student sheets.

Night Sky Journal Sheets

The purpose of these sheets is to give the students an opportunity to work on their spotting skills as they create a night sky journal throughout this leg of the journey.

Blank Space – Have the students draw what they see or add a picture in the space above the boxes.

Date and Time – Have the students add the date and time they made the observations they recorded on the night sky journal sheet.

Where we Were – Have the students write down the location that they were at when they made the observations they recorded on the night sky journal sheet.

What we Saw – Have the students enter the observations they have on the night sky journal sheet.

Astronomy 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 6: Astronomy*.

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.

Astronomy 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 astronomy. 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 astronomy.

Astronomy 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 6: Astronomy*. They can look up each term in a science encyclopedia or in the glossary included on pp. 136-137 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: Astronomy Edition, these pictures are already provided.*) This week, have the students look up the following terms:

- Astronomy – The branch of science that studies what is out in space.

For each of these sheets, you can have the students enter information only from *The Sassafras Science Adventures Volume 6: Astronomy*, 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 The Night Sky

Begin by taking a moment to discuss things that you can see in the night sky, such as stars, planets, satellites, and the moon. You can also discuss how important observation skills are for the scientist who is studying astronomy. You can view the following blog posts and podcast 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
- https://elementalscience.com/blogs/podcast/episode-9

Explain that, today, the students are going to practice their observation skills while doing a bit of night sky spotting. Then, head outside and use a telescope or binoculars to look up at the night sky. Allow the students to make observations and ask questions. Ask the students:

- ? What do you see?

Allow the students to observe the night sky for a time. You can use apps like Google Sky (Android) or StarWalk (Apple) to help identify what you are seeing. Have the students look for constellations and planets, or just have them identify the phase of the moon. Record their observations on the sheet provided in the SCIDAT logbook or in a night sky journal, as explained below.

Multi-Week Projects and Activities

Multi-week Projects

- Solar System Model – Over the weeks of this study, the students will create a large wall-sized solar system model or a smaller lap-sized construction-paper version. This week, you will need to get your model space ready. If you are going to do a wall version, pick out the wall you would like to use. If you are going to do the lap version, have the students tape together two 11"x 17" (or three 8 ½" x 11") sheets of black construction paper together to make an 11" x 34" (or 8 ½"x 33") sheet of paper.

Activities For This Week

- I Spy – Play a game of "I Spy" to help the students work on their observation skills.
- Night Sky Slime – Have the students make a batch of night sky slime! You will need clear gel glue, water, silver glitter, black (or purple) food coloring, a plastic baggie, a cup, and borax laundry booster. Begin by mixing 4 oz. of glue with 4 oz. of water, a few drops of food coloring, and a shake

of glitter in a plastic bag. Next, in a separate cup, mix a quarter cup of water with half a teaspoon of borax. Then, add the borax solution to the baggie and massage the bag for a few minutes until a nice firm slime has formed. Pull the slime out of the baggie and have fun!

Memorization

Copywork/Dictation

- **Copywork Selection**

  Astronomers study what is out in space.

- **Dictation Passage**

  Astronomy is the branch of science that studies what is out in space. Astronomers study planets, stars, black holes, galaxie,s and much more. They use telescopes, satellites, and space probes to learn about space.

Chapter 1 Notes

Chapter 2: Grid Schedule

Supplies Needed	
Demo	• Marbles, Aluminum pan, Cornstarch, Cocoa Powder, Tape measure
Projects	• Brown and yellow construction paper • Beads, String, Ice cream, Plastic baggie, Rolling pin, Cookies, Rocks, Black paint, Silver glitter

Chapter Summary

The chapter opens with Blaine, Tracey, Summer, and President Lincoln zipping to Summer's lab in Alaska. We then find out that the Man With No Eyebrows, dressed in the Dark Cape suit, is launching into space in his own personal craft (*Thad-1*) thanks to none other than Adrianna Archer. Then we switch to Agent DeBlose of the Swiss Secret Service, where we learn that he and Q-Tip are also being launched into space in the *Dauntless-12* to fix a satellite. Back at Summer's lab, the twins learn about the solar system as they re-tour her lab and realize that they have already been through the cockpit of her lab-spaceship. They meet REESE, the robot who will help them with their SCIDAT while they are in space. REESE shares information about asteroids and the chapter wraps up with a dance party, courtesy of the robot's song about gravity!

Weekly Schedule

	Day 1	Day 2	Day 3	Day 4
Read	☐ Read the section entitled "Rocketing in the Solar System" of Chapter 2 in *SSA Volume 6: Astronomy.*	☐ Read the section entitled "Summer's Spaceship and Asteroid-sharing Robots" of Chapter 2 in *SSA Volume 6: Astronomy.*	☐ (*Optional)* Read one or all of the assigned pages from the encyclopedia of your choice.	☐ (*Optional)* Read one of the additional books from your library.
Write	☐ Fill out a Astronomy Record Sheet on SL pg. 9 on the solar system. ☐ Go over the vocabulary words and enter them into the Astronomy Glossary on SL pg. 91-92.	☐ Fill out a Astronomy Record Sheet on SL pg. 10 on asteroids. ☐ (*Optional)* Add observations to the Night Sky Journal Sheet on SL pg. 7.	☐ (*Optional)* Write narration on the Astronomy Notes Sheet on SL pg. 13. ☐ Add information learned from the demonstration on SL pg. 13.	☐ (*Optional)* Complete the copywork or dictation assignment and add it to the Astronomy Notes sheet on SL pg. 13. ☐ (*Optional)* Fill out the record sheet on SL pg. 15 for one of the projects.
Do	☐ (*Optional)* Make the Solar System Bracelet.	☐ (*Optional)* Do the Asteroids and/or Meteors projects.	☐ Do the demonstration entitled "Impact."	☐ Work on the Solar System Model.

Chapter 2: List schedule

Supplies Needed	
Demo	• Marbles, Aluminum pan, Cornstarch, Cocoa Powder, Tape measure
Projects	• Brown and yellow construction paper • Beads, String, Ice cream, Plastic baggie, Rolling pin, Cookies, Rocks, Black paint, Silver glitter

Chapter Summary

The chapter opens with Blaine, Tracey, Summer, and President Lincoln zipping to Summer's lab in Alaska. We then find out that the Man With No Eyebrows, dressed in the Dark Cape suit, is launching into space in his own personal craft (*Thad-1*) thanks to none other than Adrianna Archer. Then we switch to Agent DeBlose of the Swiss Secret Service, where we learn that he and Q-Tip are also being launched into space in the *Dauntless-12* to fix a satellite. Back at Summer's lab, the twins learn about the solar system as they re-tour her lab and realize that they have already been through the cockpit of her lab-spaceship. They meet REESE, the robot who will help them with their SCIDAT while they are in space. REESE shares information about asteroids and the chapter wraps up with a dance party, courtesy of the robot's song about gravity!

Essential To-Do's

Read

- ☐ Read the section entitled "Rocketing in the Solar System" of Chapter 2 in *SSA Volume 6: Astronomy.*
- ☐ Read the section entitled "Summer's Spaceship and Asteroid-sharing Robots" of Chapter 2 in *SSA Volume 6: Astronomy.*

Write

- ☐ Fill out a Astronomy Record Sheet on SL pg. 9 on the solar system.
- ☐ Go over the vocabulary words and enter them into the Astronomy Glossary on SL pg. 91-92.
- ☐ Fill out a Astronomy Record Sheet on SL pg. 10 on asteroids.
- ☐ Add information learned from the demonstration on SL pg. 13.

Do

- ☐ Do the demonstration entitled "Impact."
- ☐ Work on the Solar System Model.

Optional Extras

Read

- ☐ Read one or all of the assigned pages from the encyclopedia of your choice.
- ☐ Read one of the additional books from your library.

Write

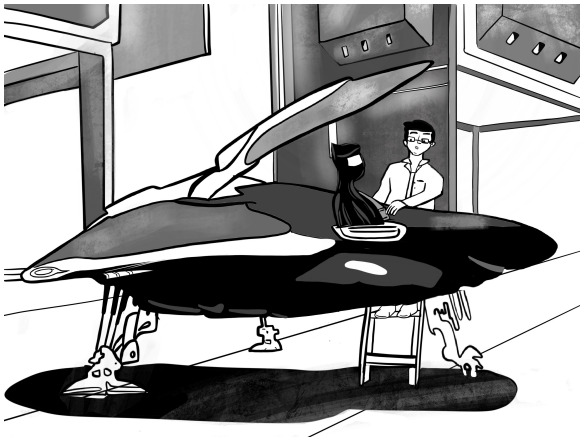
- ☐ Add observations to the Night Sky Journal Sheet on SL pg. 7.
- ☐ Write a narration on the Astronomy Notes Sheet on SL pg. 13.
- ☐ Complete the copywork or dictation assignment and add it to the Astronomy Notes sheet on SL pg. 13.
- ☐ Fill out the record sheet on SL pg. 15 for one of the projects.

Do

- ☐ Make the Solar System Bracelet.
- ☐ Do the Asteroids and/or Meteors projects.

Chapter 2: To Alaska and Beyond...

Science-Oriented Books



Living Book Spine

📖 Chapter 2 of *The Sassafras Science Adventures Volume 6: Astronomy*

Optional Encyclopedia Readings

- *Basher Science Astronomy* pg. 8 (Solar System), pg. 18 (Meteorite), pg. 28 (Asteroid Belt)
- *Usborne Children's Encyclopedia* pp. 258-259 (What's in our Solar System?)
- *DK First Space Encyclopedia* pp. 50-51 (The solar system), pp. 82-83 (The asteroid belt)
- *Kingfisher Science Encyclopedia* pp. 398-399 (The Solar System), pg. 413 (Meteors and Meteorites)

Additional Living Books

- 📖 *There's No Place Like Space: All About Our Solar System (Cat in the Hat's Learning Library)* by Tish Rabe and Aristides Ruiz
- 📖 *Scholastic Reader Level 2: Solar System* by Gregory Vogt
- 📖 *Magic School Bus Out of This World : A Book about Space Rocks* by Joanna Cole and Bruce Degen

Notebooking (SCIDAT Logbook Information)

This week, you can have the students complete a night sky journal sheet. You can also have them fill out the logbook sheets for the solar system and asteroids. Here is the information they could include:

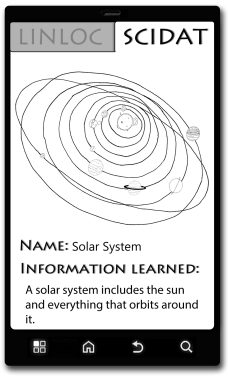
Night Sky Journal Sheets

This week, you can look for shooting stars (meteors) when you do your night sky observations.

Astronomy Record Sheets

Solar System

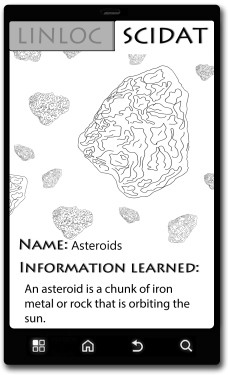
Information Learned



- ⇨ *A solar system includes the sun and everything that orbits around it. This includes the planets, asteroids, moons, comets, and all that space junk.*
- ⇨ *In our solar system, the main objects are the eight planets that orbit the sun – Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. There are a few dwarf planets, including Pluto.*
- ⇨ *There are also two large asteroid belts, known as the Asteroid Belt and the Kuiper Belt.*
- ⇨ *The gravitational pull from the sun keeps all these objects orbiting around it.*
- ⇨ *The sun is nearly 1000 times larger than all the planets put together.*
- ⇨ *Most of the planets in our solar system have an atmosphere, which is a thin layer of gas that surrounds the planet.*
- ⇨ *Our Earth is the only planet in our solar system that is known to have an atmosphere that can currently support life.*

Asteroids

Information Learned



- ⇨ *An asteroid is a chunk of iron metal or rock that is orbiting the sun.*
- ⇨ *Asteroids vary greatly in size. Some are only meters in length, while some are large enough to be named and considered planetoids.*
- ⇨ *There are over 10,000 asteroids that are large enough to be named, such as Ceres, which is about 600 miles wide and is also considered a dwarf planet.*
- ⇨ *Eros, one of the named asteroids, had a robot spacecraft landed on in 2001.*
- ⇨ *Asteroids have jagged and irregular shapes, so they don't always travel in an even, elliptical pattern as the travel around the sun.*
- ⇨ *Most of the asteroids in our solar system orbit the sun in two places—the Asteroid Belt, which is between Mars and Jupiter, and the Kuiper Belt, which is beyond Pluto.*
- ⇨ *In 1801, a Sicilian monk named Giuseppe Piazzi discovered the first asteroid in the night sky.*
- ⇨ *Some asteroids orbit much closer to Earth; we call those NEAs for Near Earth Asteroids. As they tumble through space, they can be pulled in by Earth's gravity. Once an asteroid enters Earth's atmosphere, it is called a meteor.*

Vocabulary

Have the older students look up the following terms in the glossary in the Appendix on pp. 137-138 or in a science encyclopedia. Then, have them copy each definition onto a blank index card or into their SCIDAT logbook.

- Asteroid – A rock orbiting the sun.
- Gravity – The force that pulls an object towards another larger object.
- Meteor – A rock that travels through space and burns up when it enters a planet's atmosphere; also known as a shooting star.
- Solar System – A group of planets and other objects all in orbit around the sun.

Scientific Demonstration: Impact

Materials

- ☑ Marbles
- ☑ Aluminum pan
- ☑ Cornstarch
- ☑ Cocoa Powder
- ☑ Tape measure

Procedure

1. Ahead of time, prepare the planet's surface by pouring a layer of cornstarch on the bottom of the aluminum pan about ½ inch deep and shaking lightly so that the surface is smooth. Then, sprinkle a thin dusting of cocoa powder so that the surface of the cornstarch is mostly covered.
2. Set the pan on the floor and have the students measure 1 foot up from the pan. Have them drop the marble, aiming for the center of the pan.
3. Have the students measure 3 feet up from the pan and have them drop the second marble, aiming for another part of the pan.
4. Remove the marbles, being careful not disturb the holes that were made. Have the students observe the width and depth of the hole created. Ask the students the following:
   - ? What do you notice about the holes that were created?
   - ? How did the two holes differ?

Explanation

The students should see that the marble create an indention on the surface and also displaced some of the cocoa and cornstarch near where it hit. They should also observe that when the marble is dropped from a higher height, the hole formed it a bit deeper and more cornstarch is displaced.

Take it further

Have the students create a work of impact art using cotton balls, paper, and paint. Have the students dip a cotton ball in paint and then drop it on the paper from a height of three feet using the same procedure as in the demonstration.

Multi-Week Projects and Activities

Multi-week Projects

✂ **Solar System Model** – This week, the students will add a basic sun and asteroids to their solar system model. Have the students cut out a large round yellow semi-circle and glue it to the far left of the solar system model for the sun. They will add features to this sun as part of chapter 10. Next have the students add the asteroid belt using pictures of rocks or wadded-up brown paper. This belt should be the following distance from the sun:

- ⇨ Distance for wall version: about 13 in
- ⇨ Distance for lap version: about 7 cm

Activities For This Week

✂ **Solar System Bracelet** – Have the students make a solar system bracelet. You can find directions for this project here:

- 🖱 http://formontana.net/bracelet2.html

✂ **Asteroids** – Have the students make an edible asteroid. You will need ice cream, a plastic baggie, a rolling pin, and cookies, such as vanilla wafers or Oreos. Have them place the cookies in the plastic baggie and crush them with the rolling pin. Then, have them take a scoop of ice cream and roll it around in the crushed cookies. Now that they have made your edible asteroid, the students can eat and enjoy!

✂ **Meteors** – Watch the following video on meteorites with your students:

- 🖱 https://www.youtube.com/watch?v=ZxmuB66iAiQ

Then have the students make their own meteorite. You will need rocks, black paint, and silver glitter. Have them paint their rocks completely black, then dust them with the sliver glitter to make their own meteorite.

Memorization

Copywork/Dictation

☞ **Copywork Sentence**

Our solar system includes the sun, the planets, asteroids, moons, comets, and space junk.

☞ **Dictation Selection**

Gravity pulls an object towards another, larger object. It keeps our planets orbiting around the sun instead of floating off into space. This is the same force that makes objects fall to the ground when you drop them.

Chapter 2 Notes

Astronomy Quiz #1

Chapters 2 and 3

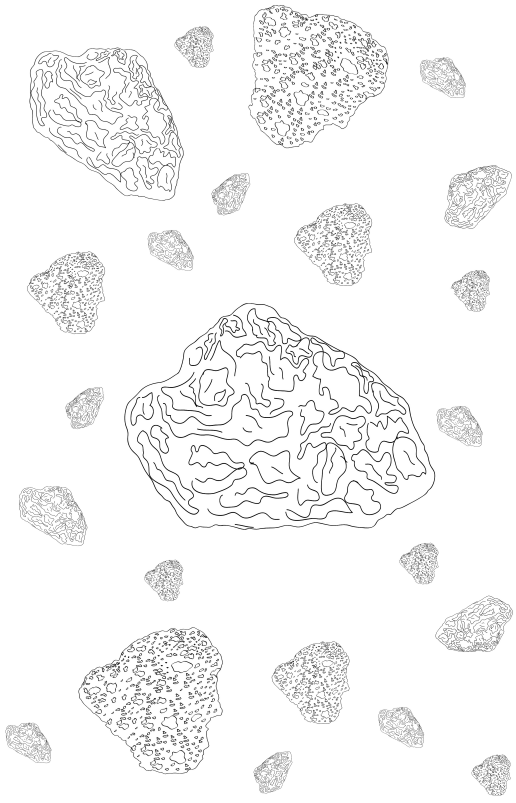
1. Our solar system includes:

The sun The 8 planets The moons

Asteroids Comets

2. _____ from the sun keeps all these objects in our solar system orbiting around it.

3. Our solar system includes two bands of drifting _____ called the Asteroid Belt and the Kuiper Belt.



4. An asteroid is a _____ orbiting the sun.

planet

rock

star

5. A star is really a huge ball of exploding _____.

gas water air

6. Put the life cycle of a star in order from the birth of a start to the end of its life.

____ Explodes and shines.

____ Born in a nebula.

____ Becomes a white dwarf.

____ Grows hotter and hotter.

____ Burns out and begins to die.

7. **True or False:** As of right now, the International Space Station is the most expensive thing man has ever built.

8. The International Space Station, also known as the I.S.S., is made from several _____ that clip together.