

Earth Science & Astronomy for the Grammar Stage

Teacher Guide

Earth Science & Astronomy for the Grammar Stage Teacher Guide

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Earth Science and Astronomy for the Grammar Stage

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Earth Science & Astronomy for the Grammar Stage

Introduction to the Updated Edition

Since writing the first edition of *Earth Science & Astronomy for the Grammar Stage*, I have co-authored *Success in Science: A Manual for Excellence in Science Education* with Bradley Hudson. The purpose of this updated edition was to re-align this program with our research. It now reflects the components of the Classic Method of elementary science instruction suggested in the book. This method is loosely based on the ideas for classical science education that are laid out in *The Well-trained Mind: A Guide to Classical Education at Home* by Jessie Wise and Susan Wise Bauer.

In *Success in Science*, we compare the elementary student to an empty bucket that is waiting to be filled with meaningful information. My goal in writing this curriculum was to provide you with tools to give your elementary student exposure to the topics of planet Earth, weather, rocks, our solar system, and the stars, thus building a knowledge base for future studies. For this reason, I have included weekly scientific demonstrations, reading suggestions, notebooking assignments, and additional activities.

This program is designed to be used during the elementary years, specifically 1st through 4th grade. It includes a buffet of options that can be completed in either two days or five days each. Alternatively, if you desire, you could set aside an hour a week to be your science day in which you do all the readings, narrations, and activities planned for the week. Please feel free to act as the student's scribe as you complete the narration pages and lab reports.

Student Workbook (SW)

This teacher's guide is designed to work in conjunction with the *Earth Science & Astronomy for the Grammar Stage Student Workbook*. This workbook is sold separately, but it is critical to the success of this program. It contains all the pages you will need to complete the narrations, lab reports, and multi-week projects. The student workbook gives the students the ability to create a lasting memory of their first journey through earth science and astronomy.

Scientific Demonstrations

The scientific demonstrations scheduled in the guide generally use easy-to-find materials and tie into what is being studied. Each one has a corresponding lab report in the student workbook. At this age, you will be the driving force behind these demonstrations, meaning that you will be the one in control, and the student will be watching and participating when necessary. These demonstrations are designed to give them a beginners' look at the scientific method and how scientific tests work. It is not necessary to ask the students to predict the outcome of the demonstration since they have no knowledge base to determine what the answer should be. However, if the students enjoy predicting or they are able to tell you what will happen, please feel free to let them do so.

Each lab report includes four sections:

1. The “Our Tools” section is for the materials that were used during the demonstration.
2. The “Our Method” section is for a brief description of what was done during the scientific demonstration. This should be in the students’ words.
3. The “Our Outcome” section is for what the students observed during the demonstration.
4. The “Our Insight” section is for what the students learned from the scientific demonstration.

Any time you see a box for a picture on the lab report, you can have the students draw what happened, or you can take a picture of the demonstration and glue it in the box. For younger students, I recommend that you do most (if not all) the writing for them on the lab reports.

Science-oriented Books

The science-oriented books section includes reading assignments from encyclopedias, discussion questions, and additional books for every lesson. Each reading assignment should be read with the students, or if they are capable, have them read the assignments on their own. After the reading assignment is completed, discuss the topic with the students using the provided discussion questions. These questions are meant to help the students begin to gather their thoughts in preparation for giving a narration.

In this edition of *Earth Science & Astronomy for the Grammar Stage*, I have also included a list of additional books for you to choose from each week. They are meant to be checked out from the library, and are not necessary to the success of this program. The list is there in case you decide that you would like to dig a little deeper into the topics. I have done my best to choose in-print, widely available books, but since every library is different, the books listed may not be available in your area. If that is the case, simply look up the topic in your local card catalog.

Notebooking

For the notebooking component, you will ask the students to narrate what they have learned from the science-oriented books. They should add their narration to their student workbook. For younger students, I recommend that you have them dictate what they have learned to you and then you write this into their student workbook. You can also have the students copy their narration into the workbook. You should expect only one to two sentences from a first- or second-grade student.

Next, have the students color the provided picture on the narration page. All the pages and pictures you need are included in the student workbook. I suggest that you read over these pages monthly so that the students get a review of what they have been learning. I have also included optional lapbook assignments in case your students prefer to use lapbooks over notebooking.

Finally, go over the vocabulary with the students and enter it into their glossary at the rear of the student workbook. You can write this for them, have them copy the definition, or dictate the definition to the students. If you choose to have the students look up the definitions, I have included a glossary of the terms in this program in the Appendix on pp. 208-210.

Multi-week Projects and Activities

This guide includes ideas for multi-week projects and additional activities that coordinate with each lesson. The pages and pictures needed for the multi-week projects are included in the student workbook, while the directions for creating the projects are found in this guide. The additional activities include crafts and other activities that can enhance the students' learning time. There are no sheets to record these additional activities in the student workbook. However, I have included a project record sheet template on pg. 212 of the Appendix of this guide.

Memorization

The elementary student is very capable of receiving and memorizing information. With this in mind, I recommend that you capitalize on this fact by having your students memorize the included vocabulary and basic facts related to earth science and astronomy. A list of simple poems that you can use to help them memorize the characteristics of animals, plants, and the body systems is included on the unit overview sheet for each unit. Remember that these poems are included as a resource for you to augment students' learning experience and are not required to use this program successfully.

Possible Schedules

I have written this updated edition to contain a buffet of activities that you can choose from when guiding the students through their first look at earth science and astronomy. This gives you, the teacher, complete freedom in what you would like to utilize to present and explore the concepts each week. However, I have also included two potential schedules for you to give an idea of how you could schedule each week. You can choose to use these as your guide or create your own. I have included two schedule templates on pp. 213-214 of the Appendix of this guide for you to use.

Coordinating Products

The following products by Elemental Science coordinate with this program. These eBooks are available separately through our website or with a combo package.

- ✦ ***Earth Science & Astronomy for the Grammar Stage Lapbooking Templates*** — We have designed templates for five lapbooks to coordinate with *Earth Science & Astronomy for the Grammar Stage*. You can use these lapbooks as a means of review or in place of the student workbook. The directions for using these templates are found in this guide under the notebooking section.
- ✦ ***Earth Science & Astronomy for the Grammar Stage Coloring Pages*** — We have prepared coloring pages to coordinate with almost every *Earth Science & Astronomy for the Grammar Stage*. Each page has a key fact about the topic along with a large picture to color.
- ✦ ***Earth Science & Astronomy for the Grammar Stage Quizzes*** — We have also created a set of weekly quizzes to use with this program. Although they are not essential, they are

helpful in assessing how much the students are retaining. You can also use these quizzes as a review of what the students have studied. You can choose to give these orally or have the students fill each one out. The correct answers for the quizzes are included each week in this guide.

Helpful Articles

Our goal as a company is to provide you with the information you need to be successful in your quest to educate your student in the sciences at home. This is the main reason we share tips and tools for homeschool science education at Elemental Blogging. As you prepare to guide your students through this program, you may find the following articles helpful:

- ✦ ***Classical Science Curriculum for the Grammar Stage Student*** — This article explains the goals of grammar stage science and demonstrates how classical educators can utilize the tools they have at their disposal to reach these goals.
 🔖 <http://elementalblogging.com/classical-science-curriculum-grammar/>
- ✦ ***Scientific Demonstrations vs. Experiments*** — This article shares about these two types of scientific tests and points out how to use scientific demonstrations or experiments in your homeschool.
 🔖 <http://elementalblogging.com/science-corner-scientific-demonstrations-vs-experiments/>
- ✦ ***The Basics of Notebooking*** — This article clarifies what notebooking is and describes how this method can be a beneficial addition to your homeschool.
 🔖 <http://elementalblogging.com/the-basics-of-notebooking/>

Final Thoughts

As the author and publisher of this curriculum, I encourage you to contact me with any questions or problems that you might have concerning *Earth Science & Astronomy for the Grammar Stage* at info@elementalscience.com. I will be more than happy to answer them as soon as I am able. You may also get additional help at our yahoo group (http://groups.yahoo.com/group/elemental_science/). I hope that you enjoy *Earth Science & Astronomy for the Grammar Stage*!

Required Book List

The following books are scheduled for use in this guide. You will need to purchase them or find a suitable substitute to complete this program.

Encyclopedias

Earth Science Units (Choose **one** age-appropriate option for each unit.)

Planet Earth (6 weeks)

📖 *Basher Science Planet Earth (best for 1st through 2nd grade)** **OR**

📖 *Discover Science Planet Earth (best for 2nd through 4th grade)*

Weather (6 weeks)

📖 *Basher Science Planet Earth (best for 1st through 2nd grade)** **OR**

📖 *Discover Science Weather (best for 2nd through 4th grade)*

Note — *The Basher Science Planet Earth book is also scheduled for use in the previous unit.*

Rocks and Fossils (6 weeks)

📖 *National Geographic Rocks and Minerals (best for 1st through 2nd grade)* **OR**

📖 *Discover Science Rocks and Minerals (best for 2nd through 4th grade)*

Note — *This unit will also schedule several pages from the Basher Science Planet Earth book used in the previous unit.*

Astronomy Units (Choose **one** age-appropriate option for each unit.)

The Solar System (12 weeks)

📖 *Basher Science Astronomy (best for 1st through 2nd grade)** **OR**

📖 *DK First Space Encyclopedia (best for 3rd through 4th grade)*

Stars and Space Exploration Tools (6 weeks)

📖 *Glow in the Dark Constellations (best for 1st through 4th grade)*

📖 *Neil Armstrong Biography (such as Who Was Neil Armstrong?)*

Note — *This unit will also schedule the Basher Science Astronomy and DK First Space Encyclopedia from the previous unit.*

**As a read-aloud*

Scientific Demonstration Books

You will need both books to complete the scientific demonstrations in this program.

📖 *Janice VanCleave's Earth Science for Every Kid* **AND**

📖 *Janice VanCleave's Astronomy for Every Kid*

Additional Books Listed by Week

The books listed below are completely optional! They are not required to complete this program. Instead, this list is merely a suggestion of the additional books that are available to enhance your studies. This list is by no means exhaustive.

Planet Earth Unit

Planet Earth Week 1

- 📖 *Flip The Flaps: Planet Earth* by Mike Goldsmith and Nicki Palin
- 📖 *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

Planet Earth Week 2

- 📖 *The Magic School Bus at the Waterworks* by Joanna Cole and Bruce Degen
- 📖 *Rivers (Blastoff! Readers: Learning About the Earth)* by Emily K. Green
- 📖 *Water, Water Everywhere (Reading Rainbow Book)* by Cynthia Overbeck Bix and Mark Rauzon
- 📖 *Lakes (Water Habitats)* by JoAnn Early Macken
- 📖 *Over in the Ocean: In a Coral Reef* by Marianne Berkes
- 📖 *Look Who Lives in the Ocean!: Splashing and Dashing, Nibbling and Quibbling, Blending and Fending* by Brooke Bessen

Planet Earth Week 3

- 📖 *The Arctic Habitat (Introducing Habitats)* by Molly Aloian and Bobbie Kalman
- 📖 *Arctic Tundra (Habitats)* by Michael H. Forman
- 📖 *A Desert Habitat (Introducing Habitats)* by Kelley Macaulay and Bobbie Kalman
- 📖 *About Habitats: Deserts* by Cathryn P. Sill
- 📖 *Life in the Desert (Pebble Plus: Habitats Around the World)* by Alison Auch
- 📖 *A Rainforest Habitat (Introducing Habitats)* by Molly Aloian
- 📖 *A Forest Habitat (Introducing Habitats)* by Bobbie Kalman
- 📖 *Northern Refuge: A Story of a Canadian Boreal Forest* by Audrey Fraggalosch
- 📖 *A Grassland Habitat (Introducing Habitats)* by Kelley Macaulay and Bobbie Kalman
- 📖 *Grasslands (About Habitats)* by Cathryn P. Sill
- 📖 *A Savanna Habitat (Introducing Habitats)* by Bobbie Kalman

Planet Earth Week 4

- 📖 *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 (Magic School Bus)* by Gail Herman and Bob Ostrom
- 📖 *Earthquakes (Let's-Read-and-Find... Science 2)* by Franklyn M. Branley and Megan Lloyd

Supplies Needed by Week

Earth Science Units

Planet Earth Unit

Week	Supplies needed
1	2 Eggs (1 raw, 1 hard-boiled)
2	Blue food coloring, 2 Clear drinking glasses, 2 Coffee cups, 1 Liter jar, Eyedropper, Ice
3	Clear drinking glass, Freezer
4	Aluminum pan, Play sand or dirt, Small play houses and people
5	Freezer with a wire rack, Square cake pan, Brick
6	Chalk, Vinegar, Glass

Weather Unit

Week	Supplies needed
1	2 Thermometers, 2 Plastic bags (1 large, 1 small)
2	Large ball of modeling clay (or salt dough), 2 Pencils, Flashlight
3	Mirror, Permanent marker, Compass, Paper
4	Glass jar or cup, Plastic wrap, Rubber band, Ice cubes
5	Plastic see-through lid, Eye dropper, Pencil
6	Glass, Freezer

Rocks and Fossils Unit

Week	Supplies needed
1	Epsom salts, 2 Small baby food jars, Cotton string, Scissors, 2 Washers, Spoon, Ruler, Paper
2	20 Toothpicks, Heavy book
3	Sponge, Bar of soap
4	3 Seashells, Vinegar, Glass
5	Cake pan, Rock about the size of your fist
6	Paper plate, Paper cup, Modeling clay, Seashell, Petroleum jelly, Plaster of Paris, Plastic spoon

Supplies Needed by Week

Astronomy Units

Solar System Unit

Week	Supplies needed
1	Ruler, Scissors, String, 4 Paper clips, Cardboard, Paper, Cake pan, Pencil
2	Clear, plastic ballpoint pen
3	Desk lamp, Pencil
4	2 Thermometers, 1 Jar with lid (i.e., tall enough to hold 1 of the thermometers)
5	String and ruler, Metal washer, Scissors, Paper, Masking tape, Book
6	2 Thermometers
7	Wide-mouthed jar, Tea bag, Pencil
8	Tape, Ruler, White poster board, Black marker, Straight pin, Scissors, Pencil, Glue
9	Desk lamp, 2 Thermometers, Ruler, Construction paper, 1 Black sheet & 1 White sheet, 2 Empty metal cans, Scissors, tape
10	2 Clear drinking cups, 2 Pennies, 2 Grape-sized pieces of modeling clay
11	Yardstick, Ruler, Modeling clay
12	Newspaper, Carbon paper, Typing paper, 1 Golf ball

Stars and Space Unit

Week	Supplies needed
1	Aluminum foil, Flashlight, Glass bowl, Pencil
2	Shoe box, Black construction paper, Flashlight, Nail or straight pin, Tape, and Scissors
3	Planetarium, Flashlight, Black construction paper
4	White paper (3 sheets), Tape, Desk lamp, Scissors
5	2 Thermometers, 2 Glasses, Aluminum foil, Rubber glove, Desk lamp, Cotton handkerchief
6	<i>No supplies needed this week.</i>

Earth Science & Astronomy for the Grammar Stage


Planet Earth Unit

Planet Earth Unit Overview

(6 weeks)

Books Scheduled

Encyclopedias

 *Basher Science Planet Earth*

OR







 *Discover Science Planet Earth*

Scientific Demonstration Book

 *Janice VanCleave's Earth Science for Every Kid*



Sequence for Study

-  **Week 1:** Planet Earth
-  **Week 2:** Oceans, Rivers, and Lakes
-  **Week 3:** Biomes
-  **Week 4:** Earthquakes and Volcanoes
-  **Week 5:** Mountains, Islands, and Glaciers
-  **Week 6:** Caring for Earth

Planet Earth Poems to Memorize

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

North America, South America joined in the west.

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

Australia stands alone, floating down below.

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

Biomes

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.

Supplies Needed for the Unit

Week	Supplies needed
1	2 Eggs (1 raw, 1 hard-boiled)
2	Blue food coloring, 2 Clear drinking glasses, 2 Coffee cups, 1 Liter jar, Eyedropper, Ice
3	Clear drinking glass, Freezer
4	Aluminum pan, Play sand or dirt, Small play houses and people
5	Freezer with a wire rack, Square cake pan, Brick
6	Chalk, Vinegar, Glass

Unit Vocabulary

1. **Continent** – A large area of land on Earth.
2. **Currents** – The movement of water or air in a particular direction, usually due to a difference in temperature.
3. **Biome** – A community of living things, both plants and animals, that are affected by the climatic conditions of the region in which they are found.
4. **Earthquake** – The shaking and vibration at the surface of Earth caused by underground movements.
5. **Glacier** – A solid river of ice.
6. **Fossil fuel** – A type of fuel that forms when plants and animals are broken down.
7. **Recycling** – The act of turning waste, like used cans, bottles, and paper, into new, usable materials.

Week 1: Planet Earth Lesson Plans

Scientific Demonstration: Wobbler

Supplies Needed

- ✓ 1 Raw egg
- ✓ 1 Hard-boiled egg

Purpose

This demonstration is meant to help the students understand how the Earth's composition affects its motion.

Instructions and Explanation

The instructions and explanation for this scientific demonstration are found on pp. 12-13 of *Janice VanCleave's Earth Science for Every Kid*. Have the students complete the Lab Report on SW pg. 9.

Take it Further

Take some time this week to familiarize your students with their student workbook.

Science-Oriented Books

Reading Assignments

📖 *Basher Science Planet Earth* pg. 7 *Earth*, pg. 10 *Core*, pg. 12 *Mantle*, pg. 14 *Crust*

📖 *Discover Science Planet Earth* pp. 6-7 *What is Earth*, pp. 8-9 *Inside Earth*

(Optional) Additional topics to explore this week: *Continents* (from *Basher Science Planet Earth*)

Discussion Questions

After reading the selected pages, ask the following questions for your discussion time.

Earth

- ? What does Earth look like from space?
- ? What is a continent?
- ? What is the atmosphere made of?

Inside the Earth

- ? What are the three main parts of the Earth?
- ? What is the crust of the Earth like? The core? The mantle?

(Optional) Additional Books

📖 *Flip The Flaps: Planet Earth* by Mike Goldsmith and Nicki Palin

📖 *Planet Earth/Inside Out* by Gail Gibbons

📖 *The Magic School Bus Inside the Earth (Magic School Bus)* by Joanna Cole and Bruce Degen

📖 *See Inside Planet Earth (Usborne Flap Book)* by Katie Daynes and Peter Allen

Notebooking

Writing Assignments

- ☐ **Narration Page** – Have the students dictate, copy, or write one to four sentences on the Earth and inside the Earth on SW pg. 8. For example, for this week the students could dictate, copy, or write the following for the Earth:

*The planet we live on is called Earth.
It has a gas blanket called the atmosphere.
Earth is blue from space.*

You can have older students label the oceans and continents or the layers of the Earth as well.

- ☐ **(Optional) Lapbook** – Have the students complete the Earth tab-book on pg. 7 of *Earth Science & Astronomy for the Grammar Stage Lapbooking Templates*. Have them cut out the pages and color the cover. Next, have the students tell you what they have learned about planet earth and write it on the “Planet Earth” page. After that, have the students label the crust, mantle, outer core, and inner core on the “Inside the Earth” page. Then, have the students tell you the seven major continents (see the labeled map on the Earth project and label them on the “Continents” page. Lastly, have them staple the pages together and glue the Earth booklet into their lapbook.

Vocabulary

The following definition is a guide. The students’ definition does not need to match word for word.

- 📖 **Continent** – A large area of land on Earth. (SW pg. 101)

Multi-week Projects and Activities

Unit Project

- ✂ **Model Planet Earth** – This project will be completed over two weeks. You will need a balloon, some newspaper, 1 cup of flour, ½ cup of water, 2 tablespoons of salt, and a globe. Begin by having the students blow up the balloon. Next, have them tear the newspaper into strips. As they are working on the newspaper strips, use the flour, water, and salt to make a thick paste. You can add more or less water to gain the desired consistency. Then, have the students dip the strips into the paste mixture and cover the balloon with one layer. Wait 30 minutes before having them add a second layer. As they do this, have them look at the globe to add any topographical features (i.e. mountains) to their model Earth. Finally, set the paper mache models in a warm, moisture-less location to dry out in preparation for next week.
- ✂ **(Optional) Model Moon** – Have the students follow the same directions in the “Model Planet Earth” project to create their own replica of the moon.

Projects for this Week

- ✂ **Coloring Pages** – Have the students color the following pages from *Earth Science & Astronomy for the Grammar Stage Coloring Pages*: Earth pg. 7, Inside the Earth pg. 8.
- ✂ **Earth** – Have the students label and color the continents (*North America, South American, Europe, Asia, Africa, Australia, and Antarctica*) on a map of the earth. You can use the map template provided in the Appendix on pg. 188. Here are the answers for you:



- ✂ **Inside the Earth** – Make an edible earth core with the students using rice krispie treats and icing. See the following website for directions:
 ☞ <http://teachbesideme.com/geography-earths-core-project/>

Memorization

- 💡 This week, begin working on memorizing the *The Seven Continents* poem. (SW pg. 110)
The Seven Continents (*Author unknown, from the At Youth Safety website*)
 North America, South America joined in the West.
 Europe and Asia meet together, and on Africa they rest.
 Australia stands alone, floating down below.
 And Antarctica is the loneliest because no one wants to go.

Quiz

Weekly Quiz

- 📌 “Planet Earth Unit Week 1 Quiz” on pg. 5.

Quiz Answers

1. Crust — the hottest part of the Earth
 Mantle — the part of the Earth that we live on
 Core — contains hot, melted rock
2. True
3. False
4. Answers will vary

Possible Schedules for Week 1

Two Days a Week Schedule	
Day 1	Day 2
<input type="checkbox"/> Read about Inside the Earth (or Core, Mantle, and Crust) <input type="checkbox"/> Add information about the inside of the Earth to the students' Narration Page <input type="checkbox"/> Do the Scientific Demonstration: Wobbler <input type="checkbox"/> Work on memorizing the <i>The Seven Continents</i> poem	<input type="checkbox"/> Read about What is Earth (or Earth) <input type="checkbox"/> Add information about the Earth to the students' Narration Page <input type="checkbox"/> Define continent <input type="checkbox"/> Work on the Model Planet Earth Project <input type="checkbox"/> Give Planet Earth Week 1 quiz

Five Days a Week Schedule				
Day 1	Day 2	Day 3	Day 4	Day 5
<input type="checkbox"/> Read about What is Earth (or Earth) <input type="checkbox"/> Add information about the Earth to the students' Narration Page <input type="checkbox"/> Complete the Earth Project	<input type="checkbox"/> Read about Inside the Earth (or Core, Mantle, and Crust) <input type="checkbox"/> Add information about the inside of the Earth to the students' Narration Page	<input type="checkbox"/> Do the Scientific Demonstration: Wobbler <input type="checkbox"/> Complete the Inside the Earth Project	<input type="checkbox"/> Work on the Model Planet Earth Project <input type="checkbox"/> Define continent	<input type="checkbox"/> Give Planet Earth Week 1 quiz <input type="checkbox"/> Choose one or more of the additional books to read from this week
All Week Long <input type="checkbox"/> Work on memorizing the <i>The Seven Continents</i> poem				

Notes

Week 2: Oceans, Rivers, and Lakes Lesson Plans

Scientific Demonstration: Currents

Supplies Needed

- ✓ Blue food coloring
- ✓ 2 Clear drinking glasses
- ✓ 2 Coffee cups
- ✓ 1 Liter jar
- ✓ Eyedropper
- ✓ Ice

Purpose

This demonstration is meant to help the students understand how temperature affects the motion of water and creates currents.

Instructions and Explanation


The instructions and explanation for this scientific demonstration are found on pp. 194-195 of *Janice VanCleave's Earth Science for Every Kid*. Have the students complete the Lab Report on SW pg. 11.


Take it Further

Have the students repeat the experiment with salty water. Simply add 2 tablespoons of salt to each of the solutions and proceed as explained in the experiment book. Have them use the eyedropper to add the hot water to the cold and vice versa to see if the addition of salt makes a difference to their results. (*The students should see that the hot salt acts the same as in the previous reaction.*)

Science-Oriented Books

Reading Assignments

 *Basher Science Planet Earth* pg. 56 River, pg. 58 Lake, pg. 60 Ocean

 *Discover Science Planet Earth* pp. 26-27, Rivers and Lakes, pp. 28-29 Oceans

(Optional) Additional topics to explore this week: *Delta and Tide* (from *Basher Science Planet Earth*)

Discussion Questions

After reading the selected pages, ask the following questions for your discussion time.

Rivers

- ? Where do rivers carry water?
- ? How does a river's journey begin and end?

Lakes

- ? What is a lake?
- ? Where are lakes typically found?

Oceans

- ? How much of the Earth do the oceans cover?
- ? What are the five main oceans?

(Optional) Additional Books

- 📖 *The Magic School Bus at the Waterworks* by Joanna Cole and Bruce Degen
- 📖 *Rivers (Blastoff! Readers: Learning About the Earth)* by Emily K. Green
- 📖 *Water, Water Everywhere (Reading Rainbow Book)* by Cynthia Overbeck Bix and Mark Rauzon
- 📖 *Lakes (Water Habitats)* by JoAnn Early Macken
- 📖 *Over in the Ocean: In a Coral Reef* by Marianne Berkes
- 📖 *Look Who Lives in the Ocean!: Splashing and Dashing, Nibbling and Quibbling, Blending and Fending* by Brooke Bessesen

Notebooking

Writing Assignments

- 📝 **Narration Page** – Have the students dictate, copy, or write one to four sentences on rivers, lakes, and oceans on SW pg. 10.
- 📝 **(Optional) Lapbook** – Have the students complete the Water on the Earth tab-book on pg. 8 of *Earth Science & Astronomy for the Grammar Stage Lapbooking Templates*. Have them cut out the pages and color the cover. Next, have the students tell you what they have learned about rivers, lakes, and oceans and write it on the respective pages. Then, have them staple the pages together and glue the booklet into their lapbook.

Vocabulary

The following definition is a guide. The students' definition does not need to match word for word.

- 🔗 **Currents** – The movement of water or air in a particular direction, usually due to a difference in temperature. (SW pg. 102)

Multi-week Projects and Activities

Unit Project

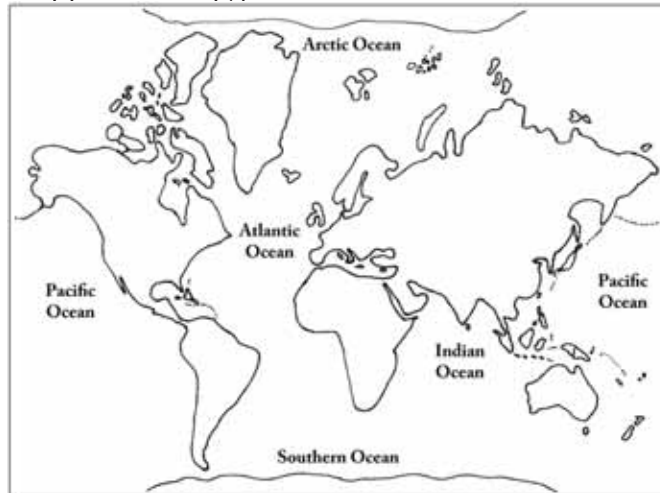
- ✂️ **Model Planet Earth** – This is the final week for this project. You will need your paper mache model from last week, a globe or picture of the Earth, and paints. This week, have the students paint their planet Earth using the globe as a guide. Once they have completed this, take a picture of their model and have them fill out the unit project sheet found on SW pg. 6.
- ✂️ **(Optional) Model Moon** – Have the students follow the same directions in the “Model Planet Earth” project to create their own replica of the moon.

Projects for this Week

- ✂️ **Coloring Pages** – Have the students color the following pages from *Earth Science &*

Astronomy for the Grammar Stage Coloring Pages: Rivers pg. 9, Lakes pg. 10, Oceans pg. 11.

- ✂ **Rivers** – Have the students research and learn more about the major rivers found in their state or country. For example if you live in Virginia, the students could study the James River, the New River, and the Potomac River. Have the older students write a report about one of the rivers that includes any legends associated with the river or the role it played in history, where it begins and ends, and any key features of the river.
- ✂ **Oceans** – Have the students label and color the world's major oceans (*Atlantic, Pacific, Arctic, Southern, and Indian Oceans*) on a map of the earth. You can use the map template provided in the Appendix on pg. 188. Here are the answers for your convenience:



- ✂ **Field Trip** – Take a field trip with the students to a local river, lake, or ocean. Allow them to explore the environment, looking for animals, plants, and geographical features.

Memorization

- 🧠 This week, continue to work on memorizing the *The Seven Continents* poem. (SW pg. 110)

Quiz

Weekly Quiz

- 📖 “Planet Earth Unit Week 2 Quiz” on pg. 6.

Quiz Answers

1. Sea
2. False (*Lakes are typically made of freshwater.*)
3. Three-quarters
4. Answers will vary

Possible Schedules for Week 2

Two Days a Week Schedule	
Day 1	Day 2
<input type="checkbox"/> Read about Oceans <input type="checkbox"/> Add information about oceans to the students' Narration Page <input type="checkbox"/> Do the Scientific Demonstration: Currents <input type="checkbox"/> Define currents <input type="checkbox"/> Work on memorizing the <i>The Seven Continents</i> poem	<input type="checkbox"/> Read about Rivers and Lakes (or Rivers) <input type="checkbox"/> Add information about rivers and lakes to the students' Narration Page <input type="checkbox"/> Finish the Model Planet Earth Project <input type="checkbox"/> Give Planet Earth Week 2 quiz

Five Days a Week Schedule				
Day 1	Day 2	Day 3	Day 4	Day 5
<input type="checkbox"/> Read about Oceans <input type="checkbox"/> Add information about oceans to the students' Narration Page <input type="checkbox"/> Complete the Oceans Project	<input type="checkbox"/> Do the Scientific Demonstration: Currents <input type="checkbox"/> Define currents <input type="checkbox"/> Work on the Model Planet Earth Project	<input type="checkbox"/> Read Rivers and Lakes (or Rivers) <input type="checkbox"/> Add information about rivers to the students' Narration Page <input type="checkbox"/> Complete the Rivers Project	<input type="checkbox"/> Choose one or more of the additional books to read from this week <input type="checkbox"/> Add information about lakes to the students' Narration Page <input type="checkbox"/> Go on a field trip	<input type="checkbox"/> Give Planet Earth Week 2 quiz <input type="checkbox"/> Finish the Model Planet Earth Project
All Week Long <input type="checkbox"/> Work on memorizing the <i>The Seven Continents</i> poem				

Notes

Week 3: Biomes Lesson Plans

Scientific Demonstration: Frosty

Supplies Needed

- ✓ Clear drinking glasses
- ✓ Freezer

Purpose

This demonstration is meant to help the students understand how frost forms in the different biomes.

Instructions and Explanation

The instructions and explanation for this scientific demonstration are found on pp. 162-163 of *Janice VanCleave's Earth Science for Every Kid*. There is no lab report for this scientific demonstration.

Take it Further

Make snow with the students. You will need a plastic bin, 2 boxes of cornstarch and one can of regular shaving cream. Pour the cornstarch into a plastic bin and squirt the shaving cream as you gently stir the mixture. The “snow” should be slightly cool and it can be shaped just like regular snow. (**Note** — *This activity can get quite messy, so you may want to do it outside.*)

Science-Oriented Books

Reading Assignments

📖 *Basher Science Planet Earth* pg. 36 *Poles*, pg. 112 *Desert*, pg. 108 *Temperate Forest*, pg. 110 *Grasslands*

📖 *Discover Science Planet Earth* pp. 30-31 *The Poles*, pp. 32-33 *Deserts*, pp. 34-35 *Forests* [**Note** — *If you choose to use this resource, you will need to read about the grassland biome from one of the additional books suggested.*]

(Optional) Additional topics to explore this week: *Biome, Tundra, Taiga, Tropical Rainforest (from Basher Science Planet Earth)*

Discussion Questions

After reading the selected pages, ask the following questions for your discussion time.

Arctic Biome (The Poles)

- ? What is it like in the arctic biome?
- ? Where is the arctic biome found on the Earth?

Desert Biome

- ? What it is like in the desert biome?
- ? What are some of the adaptations that plants and animals have made to live in the desert?

Forest Biome

- ? What is it like in the forest biome?
- ? What are the three main types of forests?

Grassland Biome

- ? What is it like in the grassland biome?
- ? What type of animals are typically found in the grasslands?

(Optional) Additional Books

- 📖 *The Arctic Habitat (Introducing Habitats)* by Molly Aloian and Bobbie Kalman
- 📖 *Arctic Tundra (Habitats)* by Michael H. Forman
- 📖 *A Desert Habitat (Introducing Habitats)* by Kelley Macaulay and Bobbie Kalman
- 📖 *About Habitats: Deserts* by Cathryn P. Sill
- 📖 *Life in the Desert (Pebble Plus: Habitats Around the World)* by Alison Auch
- 📖 *A Rainforest Habitat (Introducing Habitats)* by Molly Aloian
- 📖 *A Forest Habitat (Introducing Habitats)* by Bobbie Kalman
- 📖 *Northern Refuge: A Story of a Canadian Boreal Forest* by Audrey Fraggalosch
- 📖 *A Grassland Habitat (Introducing Habitats)* by Kelley Macaulay and Bobbie Kalman
- 📖 *Grasslands (About Habitats)* by Cathryn P. Sill
- 📖 *A Savanna Habitat (Introducing Habitats)* by Bobbie Kalman

Notebooking

Writing Assignments

- 📄 **Narration Page** – Have the students dictate, copy, or write one to four sentences on each of the 4 major biomes — arctic, desert, forest, and grasslands, on SW pp. 11-12. You can also have the older students record the typical plants and average rainfall found in the biome.
- 📄 **(Optional) Lapbook** – Have the students complete the Biomes tab-book on pg. 9-11 of *Earth Science & Astronomy for the Grammar Stage Lapbooking Templates*. Have them cut out the pages and color the cover. Next, have the students tell you what they have learned about arctic, desert, forest, and grassland biomes and write it on the respective pages. Then, have them staple the pages together and glue the booklet into their lapbook.

Vocabulary

The following definition is a guide. The students' definition does not need to match word for word.

- 📖 **Biome** – A community of living things, both plants and animals, that are affected by the climatic conditions of the region in which they are found. (SW pg. 100)

Multi-week Projects and Activities

Unit Project

✂ There is no unit project to work on this week. If your students have not completed their Earth Science & Astronomy for the Grammar Stage Teacher Guide ~ Planet Earth Unit Week 3 Biomes

model planet Earth, have them do so this week.

Projects for this Week

- ✂ **Coloring Pages** – Have the students color the following pages from *Earth Science & Astronomy for the Grammar Stage Coloring Pages*: Arctic pg. 12, Desert pg. 13, Forest pg. 14, Grassland pg. 15.
- ✂ **Habitat vs. Biome** – Explain to the students the difference between a habitat and a biome. The two appear to be similar concepts, but there is a subtle difference. Mainly, a habitat refers to the local environment, while a biome refers to a larger global ecosystem. You can use the following explanation to help you describe these differences to your students.

A habitat is the natural environment of a plant or an animal or the place that is normal for the life and growth of an animal or a plant. A biome describes the world's major communities of living things. Biomes are classified according to the predominant vegetation (plants) and characterized by adaptations of organisms (animals) to that particular environment. In other words, a habitat describes the specific neighborhood where a plant or animal is found. A biome describes major neighborhoods of the world by the plants and weather conditions that are typically found in it. A habitat refers to the local environment of a specific species, while a biome refers to a global environment.

After you are done, take the students on a walk to determine which biome you live in.

- ✂ **Biome Posters** – Have the students create a poster or fact sheet for the different biomes found on the Earth. You can use the templates provided in the Appendix on pp. 189-194.

Memorization

- 🔊 This week, begin to work on memorizing the *Biomes* poem. (SW pg. 110)

Biomes

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.

Quiz

Weekly Quiz

- 🔊 “Planet Earth Unit Week 3 Quiz” on pg. 7.

Quiz Answers

- | | | |
|---------------------------------|-----------------------------|----------------------|
| 1. Hot, cool | <i>are home to lots of</i> | 5. Answers will vary |
| 2. Prairies | <i>animals and plants.)</i> | |
| 3. False (<i>Rainforests</i>) | 4. South | |

Possible Schedules for Week 3

Two Days a Week Schedule	
Day 1	Day 2
<input type="checkbox"/> Read about the Poles and Deserts (or Poles and Desert) <input type="checkbox"/> Add information about the two biomes to the students' Narration Page <input type="checkbox"/> Do the Scientific Demonstration: Frosty <input type="checkbox"/> Work on memorizing the <i>Biomes</i> poem	<input type="checkbox"/> Read about the Forests and Grasslands (or Temperate Forest and Grassland) <input type="checkbox"/> Add information about the two biomes to the students' Narration Page <input type="checkbox"/> Define biome <input type="checkbox"/> Complete the Habitat vs. Biome Activity <input type="checkbox"/> Give Planet Earth Week 3 quiz

Five Days a Week Schedule				
Day 1	Day 2	Day 3	Day 4	Day 5
<input type="checkbox"/> Read about the Poles (or Poles) <input type="checkbox"/> Add information about the Arctic Biome to the students' Narration Page <input type="checkbox"/> Do the Scientific Demonstration: Frosty	<input type="checkbox"/> Read about the Deserts (or Desert) <input type="checkbox"/> Add information about the Desert Biome to the students' Narration Page <input type="checkbox"/> Complete the Habitat vs. Biome Activity	<input type="checkbox"/> Read about the Forests (or Temperate Forest) <input type="checkbox"/> Add information about the Forest Biome to the students' Narration Page <input type="checkbox"/> Complete one or more of the Biome posters	<input type="checkbox"/> Read about the Grasslands (or Grassland) <input type="checkbox"/> Add information about the Grassland Biome to the students' Narration Page <input type="checkbox"/> Define biome <input type="checkbox"/> Complete one or more of the Biome posters	<input type="checkbox"/> Give Planet Earth Week 3 quiz <input type="checkbox"/> Choose one or more of the additional books to read from this week <input type="checkbox"/> Complete one or more of the Biome posters
All Week Long <input type="checkbox"/> Work on memorizing the <i>Biomes</i> poem				

Notes

Planet Earth Week 1 Quiz

1. Match the following parts of the Earth with its description.

Crust The hottest part of the Earth.

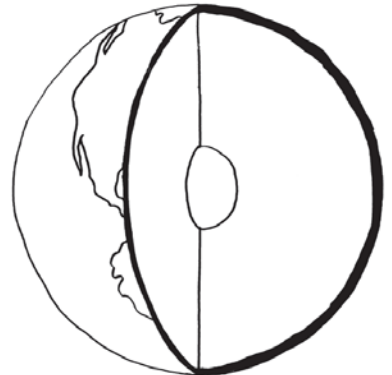
Mantle The part of the Earth that we live on.

Core Contains hot, melted rock.

2. **True or False:** A continent is a large area of land found on the Earth.

3. **True or False:** Planet Earth looks green from outer space because of all of the grass.

4. What is the most interesting thing you learned this week?



Planet Earth Week 2 Quiz

1. A river flows downhill until it reaches the _____.

land

sea

mountains

2. **True or False:** Lakes are normally saltwater.

3. Seas and oceans cover _____ of the Earth.

one-quarter

one-half

three-quarters

4. What is the most interesting thing you learned this week?



Planet Earth Week 3 Quiz

1. Most deserts are extremely (hot cool) during the day and (hot cool) during the night.

2. North American grasslands are called _____.

fields

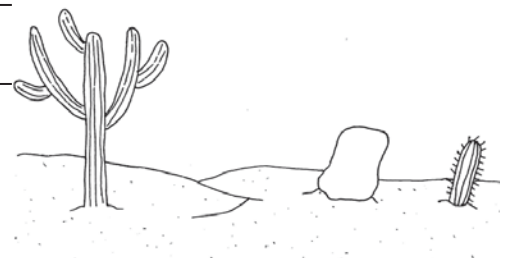
grasslands

prairies

3. **True or False:** Rainforests are home to a few different species of plants and animals.

4. Antarctica is near the (North South) Pole.

5. What is the most interesting thing you learned this week?



Earth Science & Astronomy for the Grammar Stage

Student Workbook

Earth Science and Astronomy for the Grammar Stage Student Workbook

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Earth Science & Astronomy for the Grammar Stage

Planet Earth Unit

Model of Planet Earth



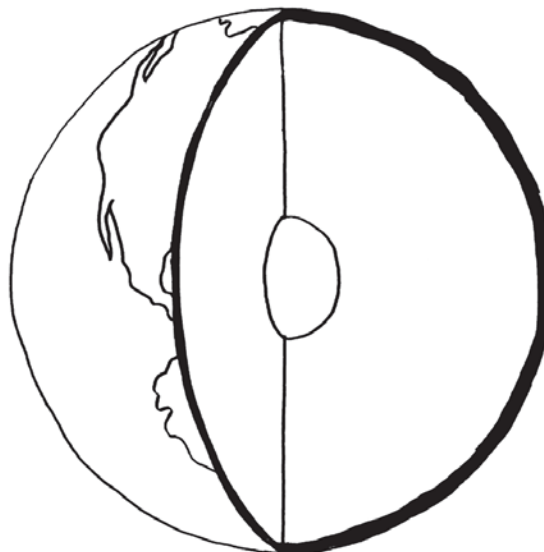
What I Learned



Earth



Inside the Earth



Lab Report: Wobbler

Our Tools

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Our Method

Our Outcome

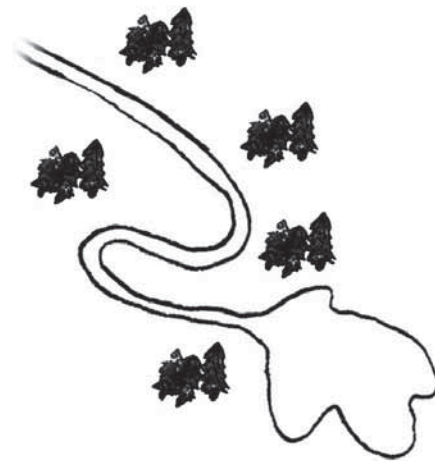
Our Insight



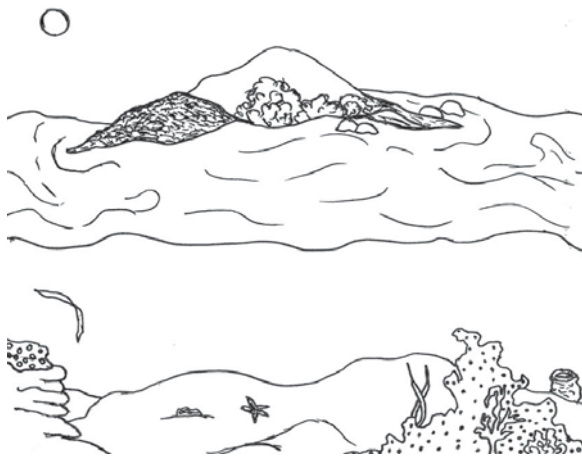
Rivers



Lakes



Oceans



Lab Report: Currents

Our Tools

Our Method

Our Outcome

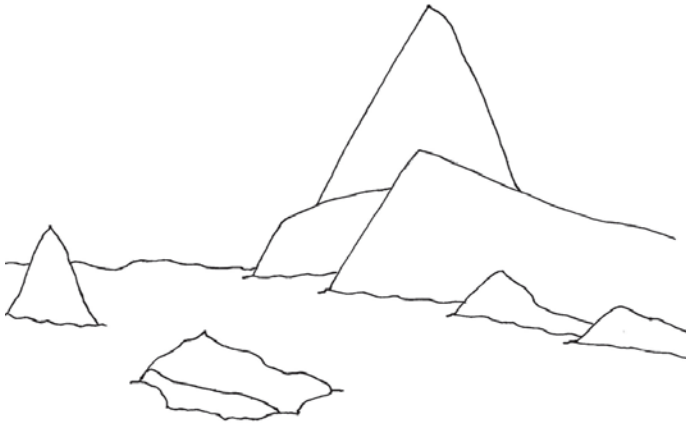
Cold Colored Water + Hot Water

Hot Colored Water + Cold Water

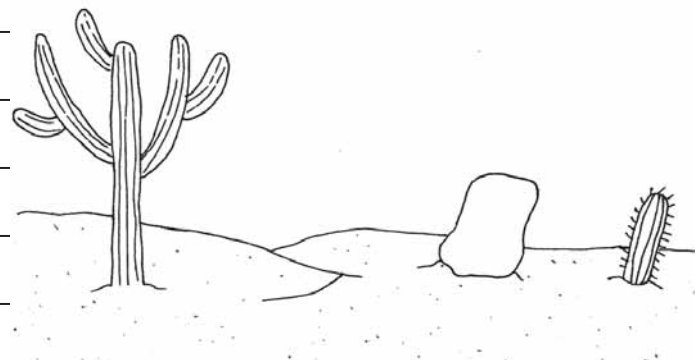
Our Insight



Arctic Biome



Desert Biome



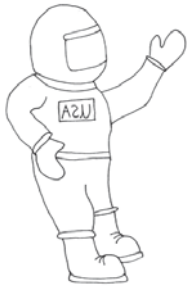
Forest Biome



Grassland Biome



Asteroid —

Astronaut —

Atmosphere —

Biome —

Planet Earth Unit

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

North America, South
America joined in the west.
Europe and Asia meet
together, and on Africa they
rest.

Australia stands alone,
floating down below.
And Antarctica is the
loneliest because no one
wants to go.



Biomes

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.