

let's talk science

Adventures in the Scientific Method

level 4



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MASTER BOOKS
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About the Author



Carrie Lindquist is a homeschool graduate, wife to Wayne, and momma to three energetic boys. She is a passionate advocate for homeschooling and loves helping new-to-homeschooling moms realize that homeschooling through the early years isn’t scary — it’s really just an extension of all the fun things they are already doing with their children! When she isn’t cleaning the endless little messes her boys create, you can find her encouraging moms to embrace the calling of everyday faithfulness.

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Course Description

Approximately 30 minutes per lesson, five times per week

Designed for fourth graders in a one-year course

In *Let's Talk Science Level 4: Adventures in the Scientific Method*, students will join characters Hannah and Ben as they explore the scientific method through the fields of chemistry and marine biology. Through conversational lessons, hands-on experimentation, observation, and documentation, students encounter God's design as they explore matter, elements, the carbon cycle, measurements, worldview, classification, the ocean, tide pools, coral reefs, algae, seagrass, and marine life.

As students discover God's wisdom in chemistry and marine biology, they'll also compile a personalized Science Notebook to document and share what they've learned each week. Along the way, they'll discover hidden treasures that teach them more about their relationship with God as they encounter God's wisdom, power, and majesty on display in creation.



Course Objectives

Students completing this course will:

- Explore elements of chemistry and marine biology, including the scientific method, lab reports, measurements, matter, the periodic table of elements, mixtures, solutions, chemistry application, tides, tide pools, algae, seagrass, coral reefs, and marine life.
- Uncover how our worldview impacts the study of science and learn a simple question to discern observational science from historical science.
- Learn how to apply the scientific method and create their own lab reports.
- Discover that science teaches many lessons about God and our relationship with Him.
- Compile a unique Science Notebook as they document what they've learned and share it with others.

A Note from the Author

Welcome to *Let's Talk Science Level 4: Adventures in the Scientific Method*! As your child begins this course, it's my prayer that they encounter the wisdom, power, majesty, and the grace of God in a new way this year as they explore His creation through chemistry and marine biology.

Each level of the *Let's Talk Science* series has been inspired by my sons and our learning adventures together. As they've continued to learn and grow, they've begun to realize that not everyone shares their worldview. This, of course, is especially true in science! This book was inspired by the questions they've asked and the topics we've explored together as they have learned how to discern worldview and apply biblical truth to what they are learning.

Science is fascinating and awe-inspiring because God's wisdom, understanding, majesty, and grace is so clearly on display in His creation. When we see His hand at work in the intricacies of atoms and molecules, the order of the elements, and even in His wise, merciful design for a fallen creation, it draws our hearts to worship Him.

Let's Talk Science: Adventures in the Scientific Method is more than an exploration of chemistry, marine biology, worldview, and the scientific method — it's an exploration of God's awe-inspiring creation, a discovery of the depth of His wisdom, a reminder that He is the source of truth, and an illustration of many spiritual lessons. Of course, sometimes science also reminds us that the world was broken through sin, and there we find God's mercy and a reminder that we all need Jesus.

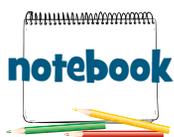
This course was founded on a desire to teach my children to actively look for God's design as they study science — a skill they can take with them as they continue their education. *Let's Talk Science: Adventures in the Scientific Method* is designed to be relational and encourage curiosity — if your child is particularly interested in a topic or question, I invite you to spend some time exploring God's world together through books, videos, and resources. See if you can find additional aspects of God's design together. And don't forget, make this course your own — have fun!

It's my prayer that your student discovers God's amazing design, wisdom, and mercy in creation this year and that they will build their lives upon the firm foundation of His Word. May God richly bless your school year!

Course Overview and Components

Schedule: The suggested weekly schedule is five days a week and has easy-to-manage lessons that guide the reading, worksheets, and activities. Teachers are encouraged to adjust the schedule as needed in order to best work within their unique educational program.

Conversational Lessons: The daily lessons in *Let's Talk Science: Adventures in the Scientific Method* are short and conversational. This allows confident readers to transition to student-led, independent instruction. If the student is younger or developing confidence in independent reading, the lessons may be read together or to the student.



Science Notebook: Students will create a personal Science Notebook to record what they've learned as they complete the course. The Science Notebook will be created in an artist sketchbook, which can be purchased in a craft store or online. It is recommended to purchase one with a sturdy cover, and it should contain a minimum of 36 blank pages.

Each week, the student will use their individual creativity to write and draw on one page of the Notebook. This hands-on expression allows the student to “own” what they've learned and share it in a personalized way. The student may use any medium (colored pencils, markers, paint, etc.) they prefer to complete the Notebook assignment.

Encourage your student to share their Science Notebook with friends and family as they tell what they've learned. Once the course is completed, the student's Science Notebook may also be saved as a keepsake.

materials needed

- Plastic wrap
- Paper towels

Materials List: Provides an at-a-glance view of the supplies your student will need to complete course activities, as well as the week those supplies will be required.

Vocabulary: New vocabulary words will be introduced to the student in a **bold green font**. A phonetic pronunciation guide is also shown to help the student read the new word, such as in this example:

environment (said this way: ěn-vī-rŭn-mĕnt)

For some words, the pronunciation may vary slightly depending upon the region in which you live. A vowel pronunciation key is included in the back of the book. Vocabulary words are also included in a glossary at the back of this book.



Apply it: This section features worksheets or activities to help the student apply what they've learned.



Digging Deeper: This section encourages the student to look up verses in their own Bible and memorize them. There are also occasional bonus questions, activities, or resources to help the student explore the topic deeper individually or as a family.



Hidden Treasure: Science illustrates and teaches us many things about our relationship with God. When we learn about our relationship with God through science, it's like finding a hidden treasure that we can share with others! This section is an opportunity for the student to share the Bible verse they learned during the week in their Science Notebook.

This component may be adjusted to fit the student's individual level. Older students may copy the verse on the back page of their Science Notebook by themselves, while younger students can help say the verse as the teacher writes it for them.



Model Biomes: After the student has finished exploring tide pools, coral reefs, and the Arctic Ocean, they will put together a model of that biome in a shoe or craft box. The lessons in weeks 23, 27, and 35 provide an instructional guide to create a simple, inexpensive biome. However, you may also customize and personalize the model biome as preferred. Many craft and hobby stores have model animals, trees, grass, and plants.

Periodic Table of Elements: The periodic table of elements is included in the back of this book for your student's reference. The student will need to refer to the periodic table in order to complete several Apply It assignments. It is recommended to laminate this page and store it in a safe place.

Helpful Tips

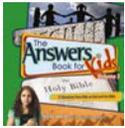
Tips for completing the Science Notebook:

- If you do not have a shoebox available, many craft and hobby stores sell shoebox-sized photo storage boxes. These are perfect for model biomes!
- Keep a variety of art supplies on hand, such as pencils, paint, colored pencils, markers, or crayons. Some students find watercolor pencils particularly enjoyable to use.
- Encourage creativity. Your student's artwork does not need to look exactly like any of the examples. The goal of the Science Notebook is for the student to express what they've learned in a way that is unique and personalized. This develops the student's ability to "own" what they've learned about.
- If your student is concerned about making mistakes, it can be helpful for them to begin drawing with a pencil. This allows them to erase perceived mistakes. Once they're done drawing, they can add colors and/or additional details.
- Encourage enjoyment rather than perfection. Three different students' Science Notebooks are included with each lesson to show different ways the student can draw the prompt. Point out that each Notebook is unique and shows the creativity God has given that student.
- If your student is reluctant to draw, it can be helpful to sit down with them and draw together. Point out a basic shape you can start with, such as a circle, oval, or rectangle, then add additional details.

Additional Tips:

- Lesson 5 covers a brief overview of the imperial system and the metric system. This lesson is intended to provide a brief and basic overview to prepare the student for Lesson 6. *Math Lessons for a Living Education Level 4* will cover the metric system at a deeper level beginning in Lesson 15.
- In Lesson 17, students learn to ask, “Can this information be observed, tested, and repeated?” to help them determine if they are learning about historical or observational science. As your student reads science books or watches television, encourage them to ask and answer this question and talk about the information they are learning.
- Lesson 19 is an introduction to taxonomy. This lesson is intended to provide a brief and basic overview of how living things are classified.
- *Let’s Talk Science: Adventures in the Scientific Method* does touch on difficult topics such as animal death in creation. It is encouraged to discuss these topics deeper with your student, depending on their individual level.

Recommended Resources from Master Books®:



The Answers Book for Kids Volume 3: Prompts for the student to read more about where the Bible came from and about worldview in this resource are included in Lessons 16 and 17. This book is not required to complete the course.



Dragons of the Deep: Your student may enjoy exploring the marine creatures in this book after Lesson 33. This book is not required to complete the course.



The New Ocean Book: The student may use this resource to look up topics of interest in order to learn about the ocean, marine life, and ocean exploration at a deeper level. This book is not required to complete the course.

Master Materials List

Basic Supplies:

These supplies will be used often throughout the course.

- Artist sketchbook (36 pages minimum)
- Colored pencils, markers, acrylic paint set with paintbrush, crayons
- Permanent marker
- Silver or white glitter glue
- Glue stick
- Stapler
- Scissors
- Ruler
- Construction paper
- 4 shoeboxes or craft boxes with lids
- Plastic tablecloths
- Measuring cups, tablespoon, teaspoon
- Toothpicks

Week 2

- Vanilla extract
- Plate

Week 3

- Baking soda
- Vinegar
- Lemon juice
- 2 bowls

Week 4

- 2 balloons
- 2 soda bottles (same size)
- Vinegar
- Lemon juice
- Baking soda
- Funnel
- Soft tailor's tape measure

Week 5

- Measuring tape
- Bathroom scale
- Gallon container

Week 6

- Kitchen scale that measures in grams or kilograms

- 2 balloons
- Yarn

Week 7

- An apple or orange
- Knife (adult supervision)
- Kitchen scale
- Cutting board

Week 8

- 2 bar magnets
- Plain M&M'S®

Week 11

- Marshmallows
- Dirt
- 2 bowls
- Hydrogen peroxide

Week 12

- Marshmallows

Week 13

- 2 clear glasses or coffee mugs
- 2 tea bags
- Sugar
- Olive or coconut oil
- Optional: milk
- Sticky tabs
- Salt
- Stopwatch

Week 14

- pH test kit or meter for soil
- Local soil

Week 15

- Sunglasses

Week 20

- Kitchen scale that measures in grams
- Pitcher
- Salt
- Jar or container
- Plate
- Ocean water from Day 2

Week 21

- Glass or plastic bottle with screw-on lid
- Blue food coloring
- Coconut or vegetable oil
- Funnel

Week 22

- Air dry modeling clay
- Paper plate

Week 23

- Air dry modeling clay
- Paper plates
- Hot glue gun (adult only)
- 3 red craft pipe cleaners
- 2 googly craft eyes
- Rocks or sand
- Blue construction paper
- Craft model sea star, sea urchins, clams, and crab from previous lessons

Week 25

- 6 Styrofoam™ cups

Week 26

- Air dry modeling clay
- Yellow or brown acrylic paint
- Paper plate

Week 27

- Toilet paper roll
- Colored tissue paper
- Sand
- Craft model brain coral and anemones from previous lessons
- Small model marine life such as turtle, manta ray, fish, etc.
- Optional: hot glue gun (adult only)

Week 28

- Stopwatch

Week 29

- Blindfold
- Clothespin
- Toothbrush
- Pepper
- Kitchen scale

Week 32

- Modeling clay

Week 33

- Onion
- Knife (adult supervision)
- Cutting board

Week 34

- Ice cubes
- Drinking glass
- Light and dark blue acrylic paint

Week 35

- Cotton balls
- Utility knife (adult supervision)
- Clear or silver glitter glue
- ½–1 inch thick Styrofoam™ panel or block
- Small model arctic marine mammals such as polar bear, seal, beluga, narwhale, or bowhead whale

Schedule

Date	Day	Assignment	Due Date	✓	Grade
Week 1		The Adventure Begins • Complete reading and activity on pages 19–20			
		Complete reading and activity on pages 21–22			
		Complete reading and activity on pages 23–24			
		Complete reading and activity on page 25			
		Complete reading and activity in your Notebook on pages 26–28			
Week 2		Science Through History • Complete reading and activity on pages 29–30			
		Complete reading and activity on pages 31–32			
		Complete reading and activity on pages 33–34			
		Complete reading and activity on page 35			
		Complete reading and activity in your Notebook on page 36			
Week 3		The Scientific Method • Complete reading and activity on pages 37–38			
		Complete reading and activity on pages 39–40			
		Complete reading and activity on pages 41–42			
		Complete reading and activity on pages 43–44			
		Complete reading and activity in your Notebook on pages 45–46			
Week 4		Lab Reports • Complete reading and activity on pages 47–48			
		Complete reading and activity on pages 49–52			
		Complete reading and activity on pages 53–54			
		Complete reading and activity on pages 55–56			
		Complete reading and activity in your Notebook on pages 57–58			
Week 5		Systems of Measurements • Complete reading and activity on pages 59–60			
		Complete reading and activity on pages 61–62			
		Complete reading and activity on pages 63–64			
		Complete reading and activity on pages 65–66			
		Complete reading and activity in your Notebook on pages 67–68			

Schedule

Date	Day	Assignment	Due Date	✓	Grade
Week 6	 Day	Mass & Matter • Complete reading and activity on pages 69–70			
	 Day	Complete reading and activity on pages 71–72			
	 Day	Complete reading and activity on pages 73–76			
	 Day	Complete reading and activity on pages 77–78			
	 Day	Complete reading and activity in your Notebook on pages 79–80			
Week 7	 Day	Describing Matter • Complete reading and activity on pages 81–82			
	 Day	Complete reading and activity on pages 83–84			
	 Day	Complete reading and activity on pages 85–86			
	 Day	Complete reading and activity on pages 87–88			
	 Day	Complete reading and activity in your Notebook on pages 89–90			
Week 8	 Day	Building Blocks of Matter • Complete reading and activity on pages 91–92			
	 Day	Complete reading and activity on pages 93–94			
	 Day	Complete reading and activity on page 95			
	 Day	Complete reading and activity on page 96			
	 Day	Complete reading and activity in your Notebook on pages 97–98			
Week 9	 Day	Elements • Complete reading and activity on pages 99–100			
	 Day	Complete reading and activity on pages 101–102			
	 Day	Complete reading and activity on pages 103–104			
	 Day	Complete reading and activity on pages 105–106			
	 Day	Complete reading and activity in your Notebook on pages 107–108			
Week 10	 Day	Periodic Table of Elements • Complete reading and activity on pages 109–110			
	 Day	Complete reading and activity on pages 111–112			
	 Day	Complete reading and activity on pages 113–114			
	 Day	Complete reading and activity on page 115			
	 Day	Complete reading and activity in your Notebook on page 116			

Schedule

Date	Day	Assignment	Due Date	✓	Grade
Week 11		Molecules • Complete reading and activity on pages 117–118			
		Complete reading and activity on pages 119–122			
		Complete reading and activity on pages 123–124			
		Complete reading and activity on page 125			
		Complete reading and activity in your Notebook on page 126			
Week 12		The Carbon Cycle • Complete reading and activity on pages 127–128			
		Complete reading and activity on pages 129–130			
		Complete reading and activity on pages 131–132			
		Complete reading and activity on pages 133–134			
		Complete reading and activity in your Notebook on pages 135–136			
Week 13		Mixtures & Solutions • Complete reading and activity on pages 137–138			
		Complete reading and activity on pages 139–140			
		Complete reading and activity on pages 141–144			
		Complete reading and activity on page 145			
		Complete reading and activity in your Notebook on page 146			
Week 14		Chemistry Around Us • Complete reading and activity on pages 147–148			
		Complete reading and activity on pages 149–150			
		Complete reading and activity on pages 151–154			
		Complete reading and activity on page 155			
		Complete reading and activity in your Notebook on page 156			
Week 15		Worldview 1 • Complete reading and activity on pages 157–158			
		Complete reading and activity on pages 159–160			
		Complete reading and activity on pages 161–162			
		Complete reading and activity on page 163			
		Complete reading and activity in your Notebook on page 164			

Schedule

Date	Day	Assignment	Due Date	✓	Grade
Week 16	 Day	Worldview 2 • Complete reading and activity on pages 165–166			
	 Day	Complete reading and activity on pages 167–168			
	 Day	Complete reading and activity on pages 169–170			
	 Day	Complete reading and activity on page 171			
	 Day	Complete reading and activity in your Notebook on page 172			
Week 17	 Day	Observational & Historical Science • Complete reading and activity on pages 173–174			
	 Day	Complete reading and activity on pages 175–176			
	 Day	Complete reading and activity on pages 177–178			
	 Day	Complete reading and activity on page 179			
	 Day	Complete reading and activity in your Notebook on page 180			
Week 18	 Day	Living Things • Complete reading and activity on pages 181–182			
	 Day	Complete reading and activity on pages 183–184			
	 Day	Complete reading and activity on pages 185–186			
	 Day	Complete reading and activity on pages 187–188			
	 Day	Complete reading and activity in your Notebook on pages 189–190			
Week 19	 Day	Classification • Complete reading and activity on pages 191–193			
	 Day	Complete reading and activity on pages 195–196			
	 Day	Complete reading and activity on pages 197–198			
	 Day	Complete reading and activity on page 199			
	 Day	Complete reading and activity in your Notebook on page 200			
Week 20	 Day	Marine Biology • Complete reading and activity on pages 201–202			
	 Day	Complete reading and activity on pages 203–204			
	 Day	Complete reading and activity on pages 205–208			
	 Day	Complete reading and activity on page 209			
	 Day	Complete reading and activity in your Notebook on page 210			

Schedule

Date	Day	Assignment	Due Date	✓	Grade
Week 21		Ocean Movement • Complete reading and activity on pages 211–212			
		Complete reading and activity on pages 213–214			
		Complete reading and activity on pages 215–216			
		Complete reading and activity on page 217			
		Complete reading and activity in your Notebook on page 218			
Week 22		Tide Pools 1 • Complete reading and activity on pages 219–220			
		Complete reading and activity on pages 221–222			
		Complete reading and activity on pages 223–224			
		Complete reading and activity on page 225			
		Complete reading and activity in your Notebook on page 226			
Week 23		Tide Pools 2 • Complete reading and activity on pages 227–228			
		Complete reading and activity on pages 229–230			
		Complete reading and activity on pages 231–232			
		Complete reading and activity on page 233			
		Complete reading and activity in your Notebook on page 234			
Week 24		Algae & Seagrass • Complete reading and activity on pages 235–236			
		Complete reading and activity on pages 237–238			
		Complete reading and activity on pages 239–240			
		Complete reading and activity on page 241			
		Complete reading and activity in your Notebook on page 242			

Schedule

Date	Day	Assignment	Due Date	✓	Grade
Week 25		Marine Food Chain • Complete reading and activity on pages 243–244			
		Complete reading and activity on pages 245–246			
		Complete reading and activity on pages 247–249			
		Complete reading and activity on page 251			
		Complete reading and activity in your Notebook on page 252			
Week 26		The Coral Reef • Complete reading and activity on pages 253–254			
		Complete reading and activity on pages 255–256			
		Complete reading and activity on pages 257–258			
		Complete reading and activity on page 259			
		Complete reading and activity in your Notebook on page 260			
Week 27		The Great Barrier Reef • Complete reading and activity on pages 261–262			
		Complete reading and activity on pages 263–264			
		Complete reading and activity on pages 265–266			
		Complete reading and activity on page 267			
		Complete reading and activity in your Notebook on page 268			
Week 28		Whales 1 • Complete reading and activity on pages 269–270			
		Complete reading and activity on pages 271–272			
		Complete reading and activity on pages 273–274			
		Complete reading and activity on pages 275–276			
		Complete reading and activity in your Notebook on pages 277–278			
Week 29		Whales 2 • Complete reading and activity on pages 279–280			
		Complete reading and activity on pages 281–284			
		Complete reading and activity on pages 285–286			
		Complete reading and activity on pages 287–288			
		Complete reading and activity in your Notebook on pages 289–290			

Schedule

Date	Day	Assignment	Due Date	✓	Grade
Week 30		Conservation • Complete reading and activity on pages 291–292			
		Complete reading and activity on pages 293–294			
		Complete reading and activity on pages 295–296			
		Complete reading and activity on page 297			
		Complete reading and activity in your Notebook on page 298			
Week 31		Scientific Method in Marine Biology • Complete reading and activity on pages 299–300			
		Complete reading and activity on pages 301–302			
		Complete reading and activity on pages 303–304			
		Complete reading and activity on pages 305–306			
		Complete reading and activity in your Notebook on pages 307–308			
Week 32		Sharks 1 • Complete reading and activity on pages 309–310			
		Complete reading and activity on pages 311–312			
		Complete reading and activity on pages 313–314			
		Complete reading and activity on page 315			
		Complete reading and activity in your Notebook on page 316			
Week 33		Sharks 2 • Complete reading and activity on pages 317–320			
		Complete reading and activity on pages 321–322			
		Complete reading and activity on pages 323–324			
		Complete reading and activity on pages 325–326			
		Complete reading and activity in your Notebook on pages 327–328			
Week 34		Arctic Ocean 1 • Complete reading and activity on pages 329–330			
		Complete reading and activity on pages 331–334			
		Complete reading and activity on pages 335–336			
		Complete reading and activity on page 337			
		Complete reading and activity in your Notebook on page 338			

Schedule

Date	Day	Assignment	Due Date	✓	Grade
Week 35	 Day	Arctic Ocean 2 • Complete reading and activity on pages 339–340			
	 Day	Complete reading and activity on pages 341–342			
	 Day	Complete reading and activity on pages 343–344			
	 Day	Complete reading and activity on page 345			
	 Day	Complete reading and activity in your Notebook on page 346			
Week 36	 Day	Review • Complete reading and activity on pages 347–348			
	 Day	Complete reading and activity on pages 349–350			
	 Day	Complete reading and activity on pages 351–352			
	 Day	Complete reading and activity on pages 353–354			
	 Day	Complete reading and activity in your Notebook on pages 355–356			

The Adventure Begins

Day



Hello there! We're so glad you're here; we've been waiting for you! My name is Ben, and this is my older sister, Hannah. Hannah and I love to explore the world God created through science.

That's right! Science is a tool God has given us. When we study God's creation through science, it helps us to ask questions, test our ideas, and share what we've learned with others. As we learn, we also discover more about God and our relationship with Him.

Ben and I have had a lot of science adventures together — in fact, we're getting ready to start a new one right now! We are excited that you're going to join us on our new adventure. Are you ready to get started?



Whoa, whoa, whoa, Hannah — we haven't even told our friend what our science adventure is going to be about this year!



Oh, right — I guess I got a little excited. Well, this year, Ben and I want to dive deeper into what science is. We have some big questions like: How does science help us to ask questions? How does science guide us as we test our ideas? Can we trust science? How can we use science to help us learn more about God's creation?

But that's not all! We also want to learn about some real scientists. We want to know what they believed, what questions they asked, and all about what they discovered. Our mom told us that we're going to answer all of our questions as we explore God's creation through biology and chemistry this year.

Name: _____

I can hardly wait! Our mom also told us that we're going to do plenty of activities as we answer our questions. We have a lot to learn about, so where should we start, Hannah?

Hmm, we will start our adventure this week by laying a good foundation. There are a few words and definitions we'll need to learn before we get started on our science adventure. Remember, a **definition** (said this way: dĕf-ŭh-nĭsh-ŭhn) is what a word means.

I hear Mom calling us now, which means we're out of time for today. Let's plan on talking more about what science is tomorrow — we'll need to go deeper than we ever have before!



1. What is something you have enjoyed learning about in science in the past?

2. What is something you would like to learn about in science?

3. What does the word "definition" mean?



Welcome back, friend! We're going to begin our adventure by taking a deeper look at the word "science."



But Ben, science isn't really a new word for us. We've been learning about science for years! Why do we need to start here?

You're right, Hannah, but now it's time to take a deeper look at what science is.



Okay, well, to begin, we know that science is a tool God has given us. When we study God's creation through science, it helps us to ask questions, test our ideas, and share what we've learned with others. As we explore, we also learn more about God and our relationship with Him.

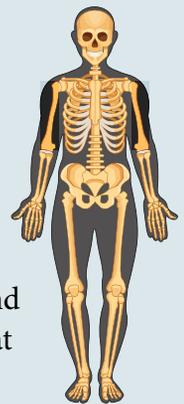
That is our foundation for what science is. Now let's build on it! Hmm, I have a question for you: what do we have inside of our bodies that helps us to stand up straight and tall?

I know! Our bones, or skeleton!

Yes! Our skeleton gives our body the structure it needs to stand and move around. Without our skeleton, we'd be all floppy like a jellyfish.

Structure (said this way: strūk-cher) provides a way to organize or support something. Science is a tool that gives us the structure we need to explore the world in an organized way — kind of like how our skeleton supports our body.

God gave us the ability to learn and explore. We can grow our knowledge and understanding about the world God created by studying science. The structure that science gives us helps us to know where to begin, how to test our ideas, and how to share our discoveries with others. Science helps us to pursue knowledge and understanding about God's creation. **Pursue** (said this way: per-soo) is a word that means to chase after, seek, or search for something.



Okay! So what you're saying is that **science** is the pursuit of knowledge and understanding about God's creation through an organized process.

Name: _____



Exactly! Let's take that definition now and add what we already knew about science. Here is our definition of science for this year:

“Science is the pursuit of knowledge and understanding about God’s creation through an organized process. Science helps us to ask questions, test our ideas, and share what we’ve learned with others. Through science, we also learn more about God and our relationship with Him.”

We’re going to be talking much more about the organized process science provides in the weeks to come. In the meantime, let’s make sure we understand what the words “knowledge,” “understanding,” and “organize” mean!



1. Circle these key words in our definition of science below: knowledge, understanding, creation, ask, test, share, God

Science is the pursuit of knowledge and understanding about God’s creation through an organized process. Science helps us to ask questions, test our ideas, and share what we’ve learned with others. Through science, we also learn more about God and our relationship with Him.

2. Ask your teacher to help you look up each word in a dictionary. Copy the definition of each word.

Knowledge:

Understanding:

Organize:



In our last lesson, we explored what science is. Let's review what we know so far:

“Science is the pursuit of knowledge and understanding about God’s creation through an organized process. Science helps us to ask questions, test our ideas, and share what we’ve learned with others. Through science, we also learn more about God and our relationship with Him.”



One important word in our definition is the word “organized.” Science is all about organization. It helps us to organize how we study the world around us, and it even helps us to organize all the things we learn about. Even science itself is organized!

Oh, that’s right! There are many things we can explore in God’s creation like plants, animals, the ocean, machines, the universe, chemicals, and so much more! Each of these different things is organized into a field, or branch, of science.

When a scientist studies the sun, moon, stars, or the far reaches of the universe, that scientist is studying the field of astronomy. We call the scientist an astronomer. When a scientist explores plants and animals, they are exploring the field of biology. We would call that scientist a biologist.

This organization helps a scientist to be able to focus in on what they are studying. For example, rather than study the whole entire world, a biologist can choose to focus on studying plants. The biologist can then work toward learning everything he or she can about several types of plants or even just one specific plant.

Science helps us to stay organized and keep our focus on what we’re learning about. This year, we’re going to focus on exploring God’s creation through biology and chemistry.



Ooh, I’m excited now! The field of biology explores the different types of life God created, from plants to people, and even animals. In chemistry, we discover the building blocks that make everything we see, from living things to non-living things.

As we explore biology and chemistry together, we’ll also be learning about the scientific method. The scientific method is how we organize our study of science. We’ll learn more about the scientific method and who developed it in the coming weeks!

Name: _____



1. Do you remember our definition of science? Fill in the missing words. You can look back in the lesson if you need to review!

“Science is the pursuit of _____ and _____ about God’s _____ through an organized process. Science helps us to _____ questions, _____ our ideas, and _____ what we’ve learned with others. Through science, we also learn more about _____ and our relationship with Him.”

2. What fields of science have you heard about?

3. Have you learned about a scientist in the past? If so, write their name and the field of science that they studied below.



As we've been talking about what science is this week, I've been thinking about one other reason we explore God's creation through science.

Oh? What is that, Ben?



Well, as we pursue knowledge and understanding of how God's creation works, we also catch glimpses of who God is. When we see how organized His creation is, it shows us that God as our Creator is also organized.

When we see one of His amazing designs in a plant, animal, or even a chemical, it reminds us that God is wise and powerful. When we learn more about God through science, we want to share that with the people around us!

It reminds me of a verse we read in Sunday school this week, Psalm 9:1-2:

I will give thanks to you, LORD, with all my heart; I will tell of all your wonderful deeds. I will be glad and rejoice in you; I will sing the praises of your name, O Most High.

I agree, Ben! When we learn more about science, it reminds me to worship and praise God. Seeing His wisdom and power on display in His creation makes me so thankful that He also cares for us. The more I learn, the more I want to tell others about His wonderful deeds! Hey, I have an idea, friend! Let's share Psalm 9:1-2 with a friend or our family and talk about God's wonderful deeds together.



Note

Day Four provides a spiritual connection for the student. There is not a worksheet on these days. Instead, the student will look up the verses and memorize from their Bible using the Digging Deeper section.



Look up Psalm 9:1-2 in your Bible. You can ask your teacher for help if you need to. If you'd like, you can highlight these verses in your Bible. Memorize Psalm 9:1-2 with your teacher or with a sibling.



Whew! We've made it to the end of our first week together — we've talked about a lot!

Let's see, we talked about what science is, and we created our definition of science. We also discussed how science is organized and how learning about science leads our hearts to praise God and tell others about Him.



And this is just the beginning! We have a lot more to learn, so we're going to need a way to document and share what we've learned with others.

Scientists throughout history have written about, drawn, or taken pictures of the things they've observed, tested, and learned so that they can share them with others. As we explore God's creation through biology and chemistry this year, we're going to create our own Science Notebook!

We'll record the things we learn about God's creation and the experiments we do in our Notebook. Each week you can share what you learned with someone else, just like a real scientist!

And my favorite part is that at the end of the year, we'll be able to look through our Notebook and remember all the things we discovered along the way! What should we add to the first page of our Science Notebook today, Hannah?

Let's write the first part of our science definition and draw a picture of the earth, one of God's creations! I have a picture of the earth right here that we can use to give us an idea for how to create our drawings.

Our younger brother Sam is too little to write the sentence with us, but he likes to add a new drawing to his Science Notebook each week just like we do. We'll show you how each of our Notebooks turns out — each of ours is unique. Have fun creating your drawing!





In your Science Notebook, write:
Science is the pursuit of knowledge and understanding about God's creation through an organized process.

- Then draw a picture of the earth.





Psalm 9:1–2 reminded us this week that as we learn, we can praise God and tell others about His wonderful deeds. Copy Psalm 9:1–2 on the back of your Notebook page.

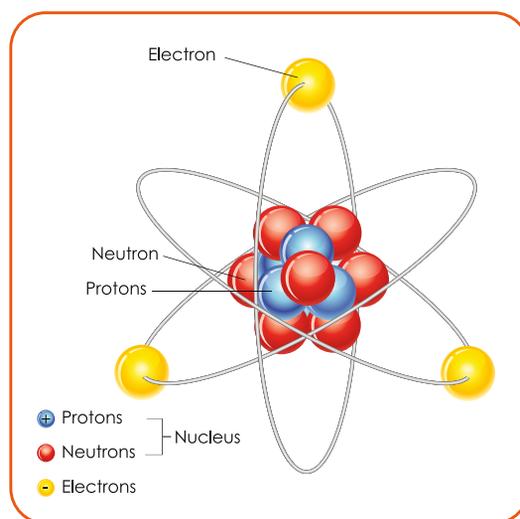
I will give thanks to you, LORD, with all my heart; I will tell of all your wonderful deeds. I will be glad and rejoice in you; I will sing the praises of your name, O Most High (Psalm 9:1–2).

Elements

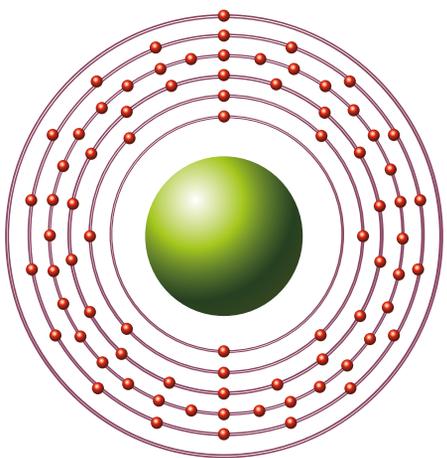
Day

Oh, hey there, friend! I'm glad you're back for another science adventure. Last time, we learned that atoms are the building blocks of matter. Hannah, do you remember the three parts an atom is made of?

I sure do! An atom is made of protons, neutrons, and electrons. Now that we've learned about atoms, it's time to explore the world of elements!



I'm excited to get started! But first, I have a question. Are all atoms the same? In other words, do they all have the same number of protons, neutrons, and electrons?



I'm glad you asked. God designed protons, neutrons, and electrons to combine in different ways to create different atoms. Let's talk about a couple different atoms today — we can start with gold.

Gold is a type of metal that is very valuable. Because it is valuable, it is also called a precious metal. Gold is often used to create valuable jewelry, like wedding rings, or it can be used as money. We know that gold is matter because it takes up space and has mass — gold is made of atoms. A gold atom has 118 neutrons and 79 protons in its nucleus (left).

Name: _____

Whoa, it would take a lot of M&M'S® to create a model of a gold atom!

It sure would! Now remember, last time we learned that electrons have a negative charge and protons have a positive charge. If an atom has more protons than electrons, the atom would have a positive charge. But if the atom had more electrons than protons, it would have a negative charge. However, an atom prefers to have an equal number of electrons and protons — this gives the atom a neutral charge.

A neutral charge means that the atom is balanced, so it won't have a positive or a negative charge to attract or repel.

Exactly. So, since a gold atom has 79 protons in its nucleus, it also has 79 electrons orbiting around the nucleus. We're out of time for today, but we're going to continue our discussion tomorrow. We'll see you then!



1. Have you ever seen gold jewelry or gold that is used as money?

2. Silver is another type of precious metal. A silver atom has 60 neutrons and 47 protons in its nucleus. How many electrons does silver have orbiting the nucleus? Remember, an atom likes to keep protons and electrons balanced.

3. Silver is used for silverware and also for jewelry. Can you find anything made of silver in your home? Write down what you find.

Day



We're continuing our exploration of atoms this week, and today we're ready to talk about the elements.

Let's get started! Atoms are the building blocks of matter. God designed the number of protons, electrons, and neutrons in an atom to combine in different ways to create different atoms. These different atoms are called substances.

A **substance** (said this way: süb-stühns) is a certain kind of matter. When a substance is pure and cannot be broken down into any other substances, we call it an **element** (said this way: ěl-űh-měnt).

Hmm, that's a little tricky to understand — but I have an example to help us! Imagine we have a peanut butter cracker sandwich in front of us. What is it made from?

That's easy! The sandwich is made from peanut butter spread between two crackers.

Right — the peanut butter and the two crackers combine to create a sandwich. Let's imagine now that we wanted to pull apart the sandwich and separate the ingredients. If we did that, we would have two separate items: the peanut butter and the crackers. We wouldn't be able to separate those items any further.

Ah, in your example, the crackers are like an element, and the peanut butter is like another element.

Right! An element cannot be broken down into any other substances. An element is made from one type of atom. Gold is an element, and pure gold is made from only gold atoms. Silver is another type of element — it is made from only silver atoms.

Scientists have been able to discover 98 elements that are found naturally on the earth. They've also been able to make 20 other elements in a laboratory. This gives us 118 different elements all together. God designed the elements to stay consistent — they are the same no matter where we find them, whether on the earth, deep within the earth, or far into outer space. Let's review what we learned today!



Name: _____



Copy each definition below.

1. A substance is a certain kind of matter.

2. An element is a pure substance that cannot be broken down into other substances.





I'm ready to learn more about elements today, how about you?

What are we waiting for? I've got a question to get us started. We learned last time that there are 118 different elements scientists have discovered. How do they keep track of all those different elements?

That's exactly what we are going to talk about today. As scientists began to discover different elements, they knew they also needed to find a way to organize the elements and show the relationships between them. But with so many elements, it was definitely not an easy thing to do!

Many different scientists worked to organize the elements, but one in particular became known as the father of the way we organize them. His name was Dmitri Mendeleev (said this way: Dŭh-mē-trē Měn-dŭh-lāy-ŭhv). Mendeleev was born in Russia in 1834, and God gave him a brilliant mind for science.

During Mendeleev's time, scientists only knew of about 63 of the elements. Mendeleev was determined to understand and organize those elements. He asked questions and played with each element like the pieces to a puzzle until the patterns became clearer to him.

But something still wasn't making sense. As he continued to work, Mendeleev realized that there must be more elements that would complete the patterns he was seeing — they just hadn't been discovered yet. He was right. And in fact, God had created the elements with such fine organization that Mendeleev was even able to predict what those missing elements would be like!

Mendeleev's chart organizing the elements became what we now call the periodic table of elements. Eventually, the missing elements were discovered, just as Mendeleev had predicted. Though other scientists also worked to organize the periodic table of elements a little better, Dmitri Mendeleev is known as the father of the periodic table.

The periodic table of elements helps scientists to organize and examine all of the different elements. It's able to give us a lot of information about each element in a clear way. We'll talk a little more about that soon! Mendeleev was able to see God's wisdom, consistency, and organization on display in the elements. Sadly, however, though Mendeleev believed there was a God, he rejected following Christ.

PERIODIC TABLE OF ELEMENTS

1 H Hydrogen																	2 He Helium														
3 Li Lithium	4 Be Beryllium							5 B Boron	6 C Carbon	7 N Nitrogen	8 O Oxygen	9 F Fluorine	10 Ne Neon																		
11 Na Sodium	12 Mg Magnesium							13 Al Aluminum	14 Si Silicon	15 P Phosphorus	16 S Sulfur	17 Cl Chlorine	18 Ar Argon																		
19 K Potassium	20 Ca Calcium	21 Sc Scandium	22 Ti Titanium	23 V Vanadium	24 Cr Chromium	25 Mn Manganese	26 Fe Iron	27 Co Cobalt	28 Ni Nickel	29 Cu Copper	30 Zn Zinc	31 Ga Gallium	32 Ge Germanium	33 As Arsenic	34 Se Selenium	35 Br Bromine	36 Kr Krypton														
37 Rb Rubidium	38 Sr Strontium	39 Y Yttrium	40 Zr Zirconium	41 Nb Niobium	42 Mo Molybdenum	43 Tc Technetium	44 Ru Ruthenium	45 Rh Rhodium	46 Pd Palladium	47 Ag Silver	48 Cd Cadmium	49 In Indium	50 Sn Tin	51 Sb Antimony	52 Te Tellurium	53 I Iodine	54 Xe Xenon														
55 Cs Cesium	56 Ba Barium	57 La Lanthanum	72 Hf Hafnium	73 Ta Tantalum	74 W Tungsten	75 Re Rhenium	76 Os Osmium	77 Ir Iridium	78 Pt Platinum	79 Au Gold	80 Hg Mercury	81 Tl Thallium	82 Pb Lead	83 Bi Bismuth	84 Po Polonium	85 At Astatine	86 Rn Radon														
87 Fr Francium	88 Ra Radium	89 Ac Actinium	104 Rf Rutherfordium	105 Db Dubnium	106 Sg Seaborgium	107 Bh Bohrium	108 Hs Hassium	109 Mt Meitnerium	110 Ds Darmstadtium	111 Rg Roentgenium	112 Cn Copernicium	113 Nh Nihonium	114 Fl Flerovium	115 Mc Moscovium	116 Lv Livermorium	117 Ts Tennessine	118 Og Oganesson														
																		58 Ce Cerium	59 Pr Praseodymium	60 Nd Neodymium	61 Pm Promethium	62 Sm Samarium	63 Eu Europium	64 Gd Gadolinium	65 Tb Terbium	66 Dy Dysprosium	67 Ho Holmium	68 Er Erbium	69 Tm Thulium	70 Yb Ytterbium	71 Lu Lutetium
																		90 Th Thorium	91 Pa Protactinium	92 U Uranium	93 Np Neptunium	94 Pu Plutonium	95 Am Americium	96 Cm Curium	97 Bk Berkelium	98 Cf Californium	99 Es Einsteinium	100 Fm Fermium	101 Md Mendelevium	102 No Nobelium	103 Lr Lawrencium

Name: _____



1. There are 118 elements on the periodic table of elements. Find these elements in the word search below.

Gold Oxygen Nitrogen Silver Hydrogen
Sodium Zinc Nickel

O	H	Y	D	R	O	G	E	N	X	Z
X	Z	N	V	B	S	O	D	I	U	M
Y	S	I	L	V	E	R	L	C	F	G
G	A	S	N	E	N	E	L	K	B	O
E	S	V	Q	C	W	P	O	E	K	L
N	I	T	R	O	G	E	N	L	P	D

2. How does the periodic table of elements help scientists?



I really enjoyed learning more about atoms and the elements this week. I'm so excited to continue exploring the elements next week as well.



Me too. This week, I've been thinking about how God created each of the elements that scientists have been able to discover. The way the elements can be organized is amazing to me!

At the beginning of our science adventure this year, we talked about how science helps us organize and understand God's creation. It's important to remember that science can be organized because God created the world in an organized way. Science reveals the organized nature, infinite wisdom, and the power of our Creator.

The more we learn together, the more it reminds me of what we read in the Bible in Romans 1:20,

For since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that people are without excuse.

As we study God's creation through science, it reveals His eternal power and divine nature to us. The delicate design of a butterfly's wing, incredible night sky, and even the organization of the elements declare to us the glory, power, and majesty of God.

But like we saw this week, we have a choice to make as we continue to learn. We can choose to see God's glory, power, and majesty on display as we study His creation — or we can reject Him.

Though many scientists do follow Jesus Christ with their lives and trust what the Bible tells us, many others choose to close their eyes to God's glory, power, and majesty in His creation. They refuse to recognize God as our Creator and ultimately choose to reject God in their lives.

I've chosen to follow Jesus for my whole life, and I love to see His amazing design on display when we study science!



Has anyone in your family chosen to follow Jesus? Ask them to tell you about the day they decided to become a Christian. Then look up Romans 1:20 in your Bible. If you'd like, you can highlight this verse. Memorize Romans 1:20 with your teacher or with a sibling.



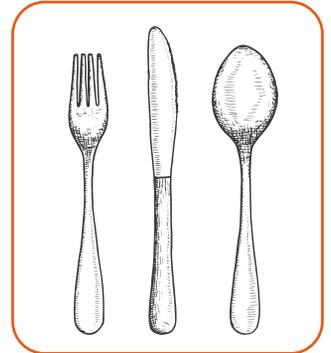
Day

Hey, friend! We're here and ready to add a new page to our Science Notebook today.

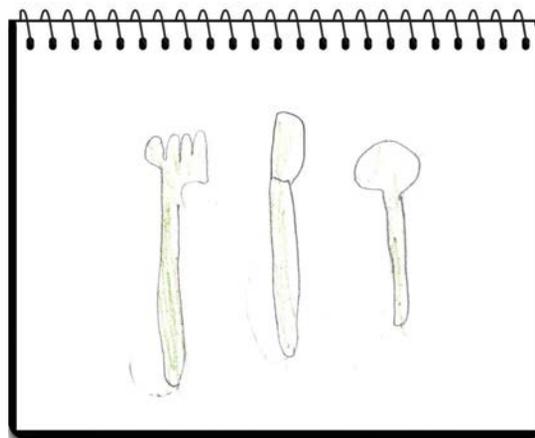
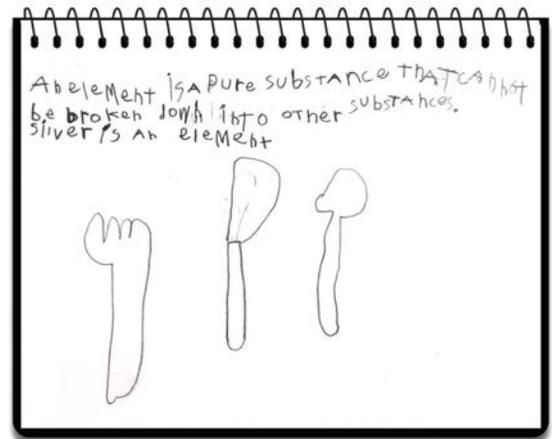
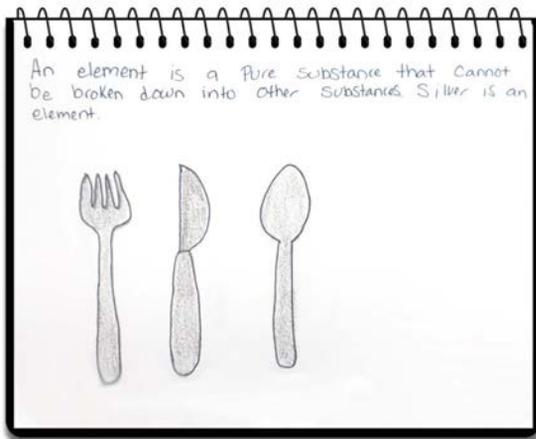


We learned more about atoms, elements, and the periodic table of elements this week. I'm excited to share what we've learned in our Notebooks! What should we draw this week, Hannah?

Well, we talked a little bit about the elements of silver and gold. Mom told us that the silverware in the kitchen is made from silver! I was thinking we could draw a picture of our silverware this week. I have an example picture we can use right here.



Great idea. Let's get started — we'll show you how our Notebooks turned out, and we can't wait to see yours!





In your Notebook, write: An element is a pure substance that cannot be broken down into other substances. Silver is an element.

Then draw a picture of silverware.



Learning about the organization of the elements this week reminded us that God's power is on display through His creation. Copy Romans 1:20 on the back of your Notebook page as a reminder.

For since the creation of the world God's invisible qualities—his eternal power and divine nature—have been clearly seen, being understood from what has been made, so that people are without excuse (Romans 1:20).

Living Things

Hello! Are you ready for our next science adventure? We've explored many parts of chemistry together, and now it's time to turn our focus to the field of biology.

Woohoo! I'm excited to begin. Biology is a field of science that studies living things, and there are so many different living things to learn about. Just think about it — a biologist can study the human body, animals, flowers, trees, plants, ocean life, cells, ecosystems, and more!

Biology is definitely a broad field of science. There is so much we could explore — but let's start by talking about living things.

All right! My first question is, where did living things come from?

That is a great question, Ben. It is also one of the historical science questions that many biologists ask. We cannot observe, test, or repeat where the first living things came from — but we can look for eyewitness accounts and evidence to help us support our theory.

Then we should begin with the Bible because it is the foundation of our worldview. God was there at the very beginning, and He knows how life came to be!

Yes, He does! To form our worldview, we begin with Genesis 1:1,

In the beginning God created the heavens and the earth.

Whoa, hold on a second. I just remembered we learned before that there are basically two different worldviews. The biblical worldview, which is our foundation, begins with God and how He created the world as the Bible tells us. But what does a secular, or evolutionary, worldview begin with?

Well, the evolutionary worldview does not begin with God or with His Word. That means that this worldview develops very different theories to answer questions about historical science. In the evolutionary worldview, life and the universe just happened over the course of millions and billions of years. This is called the theory of evolution.



Name: _____

You may have heard parts of the theory of evolution as you read books or watched television shows about science.

Hmm, if we're going to spot the differences between these worldviews, then we need to make sure we understand our worldview really well. Let's go back to Genesis to learn what the Bible has to say about where living things came from.



Read Genesis 1 in your Bible. What did God create on each day? Write your answer.

1. On the first day, God created _____.

2. On the second day, God created _____.

3. On the third day, God created _____.

4. On the fourth day, God created _____.

5. On the fifth day, God created _____.

6. On the sixth day, God created _____.

7. Now read Genesis 2:1-3 in your Bible. What happened on the seventh day?

8. According to the Bible, where did living things come from?



Welcome back! Yesterday, we developed our biblical worldview. In order to answer the historical science question, “Where did living things come from?” we went straight to the Bible to read an eyewitness account. In the Bible, we learned that God created the heavens, the earth, and all living things in six days. Then He rested on the seventh day. This is our worldview foundation as we answer questions about historical science.



Our question, “Where did life come from?” is a historical science question. To answer this question, we start with the Bible to form our hypothesis. Based on what we read in the Bible, our hypothesis is that God created the heavens, the earth, and all living things just as it says in Genesis. Scientists with a biblical worldview examine the evidence found in the world around us to support this hypothesis. Their theory can be called **creationism** (said this way: krē-ā-shūh-nīz-ūhm).

Now, because this theory answers a question about historical science, we cannot observe, test, or repeat history to prove our theory the way we could with observational science. But we can look for additional evidence that supports our theory.

We’ve talked before about how science is all about organizing things. Why do you think we are able to organize things in science so well, Ben?

Well, according to our worldview, God is the Creator. We learn in 1 Corinthians 14:33 that God is not disorganized; He is a God of organization and peace. So, we would expect to also see organization in His creation.

Indeed. We find organization all through creation. One way scientists can organize things is by separating creation into groups of living and nonliving things. Living things have certain traits or properties that can help us identify them. Let’s think of some things that living things must be able to do.

Well, to begin, a living thing must be able to breathe. Humans and animals breathe air through nostrils — that’s a big word for the holes in our nose. Birds breathe through nostrils in their beaks, and fish breathe through their gills.

Name: _____

Another word that we can use for breathe is respiration. **Respiration** (said this way: rĕs-pŭh-rāy-shŭn) is the process of breathing. Usually, living things inhale or absorb oxygen and exhale or release carbon dioxide through respiration. Hmm, plants are also grouped into the category of living things. Can you tell us how plants breathe, Ben?



Sure thing. Plants breathe through the process of photosynthesis as they absorb carbon dioxide and release oxygen.

Excellent! There are a few more traits that we can use to identify living things — but we're out of time for today. We'll pick this adventure up again tomorrow.



1. Respiration is one way we can identify living things. Based on this information, how many living things can you find in or around your home?

2. What other ways do you think we might be able identify living things from nonliving things?



Hello, friend. We were just about to continue our science adventure from yesterday. Remember, living things can be identified by certain traits or properties that they all have in common. For instance, all living things must breathe.

Another way we can identify living things is that they can grow. A baby grows into an adult, a puppy grows into a dog, a baby bird will become an adult bird, fish grow bigger, and plants grow from a small seed into a larger plant.



Wait, what was that noise?

Oh, just my stomach growling. I'm awfully hungry and ready for lunch!



Speaking of lunch, living things also need food to provide nutrients.

Ah, that makes sense! **Nutrients** (said this way: new-trēē-ěnts) are a substance that plants, animals, and people need to grow and live. Nutrients provide the energy that living things need. People, birds, animals, and fish absorb nutrients from the food they eat. Plants absorb the nutrients they need through their roots.

And speaking of energy, living things can also move on their own, or respond to the environment around them. I can move my body, and so can animals, birds, and fish. But what about plants?

Ah, plants are interesting living things indeed! While they don't have a body or limbs like people, animals, birds, and fish, they can adjust their leaves to better face the sun. This helps them absorb the most sunlight for photosynthesis. Some types of flowers can also open and close their petals or fold up their leaves in the evening in response to the environment around them.

So, scientists define a living thing as something that grows, moves, requires nutrients, and has respiration. Is there anything else we can use to identify a living thing?

Actually, there is. Living things also reproduce. People, birds, animals, and fish reproduce by having babies or laying eggs. Plants and trees reproduce through seeds. We see in Genesis 1:28 that this is part of God's design:

God blessed them and said to them, "Be fruitful and increase in number; fill the earth and subdue it. Rule over the fish in the sea and the birds in the sky and over every living creature that moves on the ground."

Name: _____

God designed living things to reproduce and increase in number. One thing we notice in living things is that they reproduce after their kinds — we'll be talking more about that next week!



We've learned five traits we can use to identify living things. Write those five traits below. You can look back in this lesson and in Day 2's lesson if you need to.

1. _____
2. _____
3. _____
4. _____
5. _____





It's been fun to learn about living things this week, and I'm excited to continue our exploration of biology next week! In the meantime, I have a question. We learned that scientists organize creation into living and nonliving things. We also learned that living things must breathe, grow, move, eat, and reproduce. Human beings are living things — but what makes us different from the plants, animals, birds, and fish that are also living things?

Excellent question, Ben! Though science can help us organize and define what a living thing is, it can't tell us why humans are different than other living things. To answer this question, we need to turn back to the Book of Genesis. Do you remember what we learned on Day 1 this week, Ben?

Yes — we studied what God created on each day.

Let's review what the Bible says about the living things God created. In Genesis 1:11, it says this about the third day of creation,

Then God said, "Let the land produce vegetation: seed-bearing plants and trees on the land that bear fruit with seed in it, according to their various kinds." And it was so.

On the fifth day of creation, God created the living things that dwell in the water and in the air. In other words, birds and marine life! In Genesis 1:20 it says,

And God said, "Let the water teem with living creatures, and let birds fly above the earth across the vault of the sky."



On the sixth day, we read that God created the living creatures that dwell on the land. Genesis 1:24 says,

And God said, "Let the land produce living creatures according to their kinds: the livestock, the creatures that move along the ground, and the wild animals, each according to its kind." And it was so.

But that wasn't all God created on the sixth day! Let's read Genesis 1:26–27 very carefully together. What do you notice that is different?

Then God said, "Let us make mankind in our image, in our likeness, so that they may rule over the fish in the sea and the birds in the sky, over the livestock and all the wild animals, and over all the creatures that move along the ground." So God created mankind in his own image, in the image of God he created them; male and female he created them.

Hmm, it says that God created mankind in His image — He didn't create plants or other living things in His image.

Exactly! We've talked before about what it means to be made in the image of God. In Genesis 2:7 we also read a few more details about the creation of mankind,

Then the LORD God formed a man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being.

God only made mankind in His image and gave us the breath of life. This is what makes human beings different from all the other living things God created.



Look up Genesis 2:7 in your Bible. If you'd like, you can highlight this verse in your Bible. Memorize Genesis 2:7 with your teacher or with a sibling.



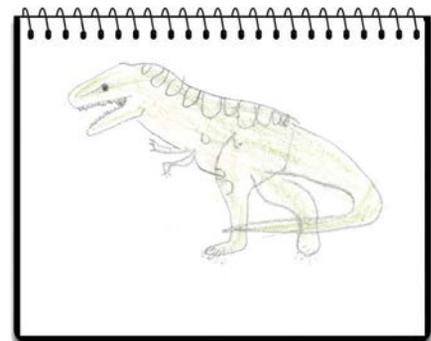
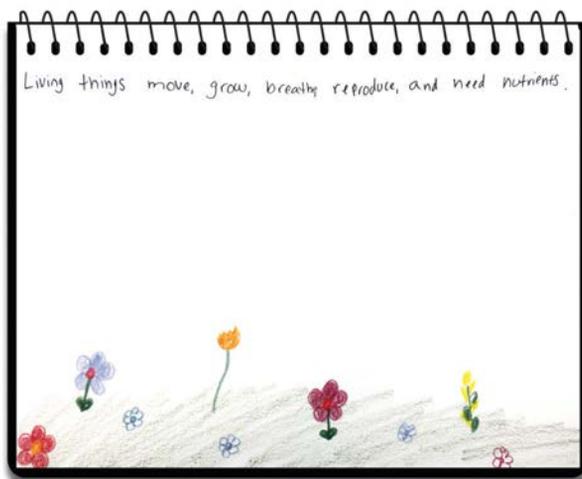
Did you have fun learning about what makes a living thing a living thing this week, friend?



I sure did — and now I'm ready to add a new page to my Science Notebook! God created so many different types of living things. I was thinking it would be fun to draw a picture of our favorite living things. It could be a person, animal, plant, bird, fish, lizard — anything that is classified as a living thing.

That sounds like fun! We can use our imaginations to help us draw our favorite living things. Or we can find a picture of our favorite living thing in a book or magazine.

Here is what our drawings look like. I drew a picture of a cat. Hannah loves flowers, so she drew a field of flowers, and Sam drew his favorite dinosaur. We can't wait to see what your favorite living thing is!





In your Notebook, write:
Living things move, grow,
breathe, reproduce, and need
nutrients.

• Then draw a picture of your favorite living
• thing.
•
•
•



Learning about living things this week also reminded us that God created human beings different from all the other living things. Copy Genesis 2:7 on the back of your Notebook page as a reminder.

Then the LORD God formed a man from the dust of the ground and breathed into his nostrils the breath of life, and the man became a living being (Genesis 2:7).



The Great Barrier Reef

Day

I'm so excited that you're here; I thought you'd never come!

materials needed

- Shoebox
- Plastic tablecloth
- Acrylic paint
- Paintbrush
- Water

Hello, friend! Ben is a little excited to begin our science adventure for this week. We're going to learn about the largest barrier reef in the entire world — the Great Barrier Reef!

Note

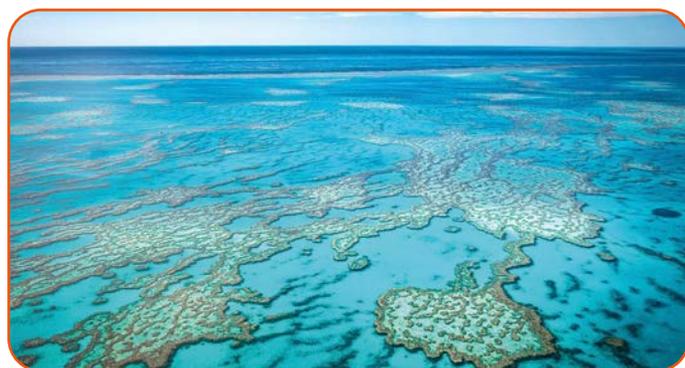
The student will complete several projects during the course of this week. For a full list of required materials, please refer to the Master Materials List.

I'm not a little excited, I'm a lot excited! We have so much to explore — and we'll get to make our own model coral reef at the end of this week.

What are we waiting for, then? Let's get started. The Great Barrier Reef is found off the coast of eastern Australia in the Coral Sea. It is the largest barrier reef in the world and stretches for over 1,400 miles.

That is one big coral reef!

Actually, the Great Barrier Reef is a chain of over 2,500 different reefs and hundreds of islands. It is so large that it can be seen from outer space.



I guess that is why we call it great, huh?

It must be! The Great Barrier Reef is one of the world's most beautiful and diverse ecosystems. It is home to around 600 types of coral and thousands of different species of marine life like fish, sharks, whales, turtles, octopuses, manta rays, and so much more. We'll learn about a few of the marine creatures found around the Great Barrier Reef this week. But first, let's talk a little more about coral. One of the most common types of coral found in the Great Barrier Reef is called staghorn.

Hmm, I've seen pictures of staghorn coral in my books about the ocean. This type of coral has branches that extend like tree branches and twigs — it looks kind of like a deciduous tree in the fall.

Right! Its shape has also been compared to the antlers on a deer. Though it looks like a tree, remember that staghorn coral is actually part of the animal kingdom. These corals are made from hundreds or thousands of polyps living together in a colony. Staghorn coral can grow to be up to five feet tall. It can also grow tightly together and create a dense staghorn thicket.

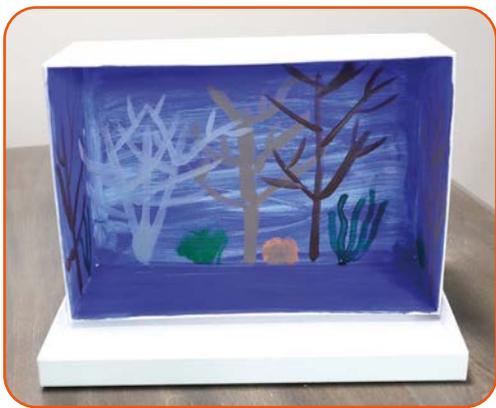
Staghorn provides shelter and a habitat for other living things in the Great Barrier Reef. This type of coral is often tan, light brown, or gray, though you may occasionally spot brighter colors.



I have an idea — let's get started on our coral reef model today! We can paint the inside of our shoebox and then paint some staghorn coral as well. Ready to get started?

Activity directions:

1. Spread out a plastic tablecloth to protect your surface. Paint the inside of your shoebox blue then rinse out your paintbrush. Allow the inside of the box to dry.
2. Paint groups of staghorn coral on the inside of the shoebox. You can use tan, gray, or another color of paint to create your staghorn corals.
3. If you'd like, you can paint seaweed, seagrass, or more types of coral near the bottom of the shoebox model. Rinse out your brush and allow the paint to dry.



4. Set your shoebox in a safe place — we'll finish our coral reef later this week!

Day

Welcome back, friend! Today, we're going to begin learning about some of the other marine animals that live in the Great Barrier Reef. Ben has been studying so that he can tell us about two special creatures. What are we going to learn about today, Ben?

materials needed

- Scissors
- Toilet paper roll
- Colored tissue paper
- Glue stick
- Plastic tablecloth

The sea anemone (said this way: ūh-nēm-ūh-nē) and the clownfish. Let's start with sea anemones first. Sea anemones are invertebrate polyps. They are classified in the Cnidaria phylum alongside coral polyps and jellyfish.

There are over 1,000 different species of sea anemone found in oceans around the world — some species can even be found in tide pools! Anemones can be smaller than a quarter or grow to be over five feet wide. Like coral polyps, anemones have a tube-like body and tentacles. Most anemones anchor themselves in one place through a single foot called a pedal disc.

Neat! What do sea anemones eat?

These animals are carnivores; they'll eat zooplankton or other types of small fish. Sea anemones use their tentacles to sting passing prey. Their sting injects a poison called a neurotoxin (said this way: nyoor-ōh-tōk-sin) into their prey. The neurotoxin paralyzes the prey so that it cannot escape. Once the prey is captured, the anemone's tentacles move it to its mouth.

Now, with all of those stinging tentacles and a poisonous neurotoxin, you might think that no other creature would want to live anywhere near it — but sea anemones actually have a symbiotic relationship with clownfish!

Wait, clownfish? Wouldn't the anemone just sting and eat the clownfish?



It can try, but clownfish are protected from the anemone's sting by a mucus coating. In other words, the clownfish can swim into and all around the sea anemone — but the stings don't affect it. This allows clownfish and anemones to create a mutualistic relationship. The anemone gives the clownfish a safe place to live, while the clownfish helps to keep the anemone clean and provides additional nutrients for it.

That is really interesting. Thanks for sharing with us, Ben!

Sure thing! But we're not done yet — I also have an idea for how we can create our own model sea anemone. We'll use our model later this week in our coral reef. Let's get started!

Activity directions:

1. Spread out a plastic tablecloth to protect your surface. Cut the toilet paper roll in half.
2. Cut 2–3 sheets of tissue paper about 2–3 inches taller than the roll and 6–8 inches long.
3. Use the glue stick to spread glue on the bottom inch of the first sheet of tissue paper. Then, press the roll into the glue and roll the tissue paper around it.



4. Repeat this process to glue the second and third sheets of tissue paper to the roll.
5. Repeat the process to create the second sea anemone.
6. Stand the sea anemones up, with the roll sitting on the table. Use scissors to cut the top of the tissue paper in thin strips — the cut should go almost to the roll.
7. Fluff the tissue paper strips so that they resemble a sea anemone's tentacles.



8. Show someone your sea anemones and tell them what you learned about them. Then set your anemones in a safe place; you'll use them later this week!



Today we're going to learn about one of my favorite marine creatures, sea turtles! There are seven different species of sea turtles found around the world.

The seven species of sea turtle are named the green sea turtle, leatherback, flatback, olive ridley, Kemp's ridley, hawksbill, and the loggerhead.

Each of those species, except for Kemp's ridley, lives in or around the Great Barrier Reef. The most common type of sea turtle found in the Great Barrier Reef is the green sea turtle, so let's learn about it today!

The green sea turtle is one of the largest sea turtles in the world. Their smooth shell can grow to be up to five feet tall, and they can weigh up to 700 pounds.

Ooh, I have a fun fact for us! A turtle's shell is also called a carapace (said this way: kair-ŭh-pās). Turtles on land are known to pull, or retract, their heads and flippers into their carapace to protect themselves. However, the green sea turtle doesn't have this ability.



Interesting! Now you may have noticed from looking at the picture of a green sea turtle that it doesn't really look green.

Hmm, that's right, now that you mention it. So why do we call them green sea turtles?

Their name comes from the green-tinted fat they have underneath their skin. Adult green sea turtles are primarily herbivores, eating green seagrasses and algae. Scientists believe that their diet may be responsible for the color of their fat.

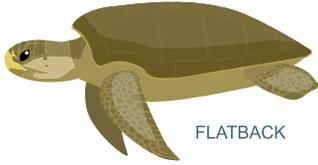
One amazing skill green sea turtles have is their ability to migrate. **Migrate** (said this way: mī-grāt) means to travel from one place to another, often over a very large distance. Green sea turtles are known to migrate hundreds or even thousands of miles away from the beach where they hatched. But, when it is time for a green sea turtle to lay her eggs, she will often return to the very same beach where she hatched.

Whoa, and they do that without a map or without anyone to give them directions!

Exactly! Mom told me she wouldn't be able to navigate back to the place where she was born without the help of a map or a GPS. But God designed the green sea turtle with the ability to travel thousands of miles and still return to the place it started. Though scientists have studied their migration for years and years, they still aren't sure exactly how the turtle is able to accomplish this.

Well, we can be sure of one thing — since God is their Creator, He knows exactly how they do it!

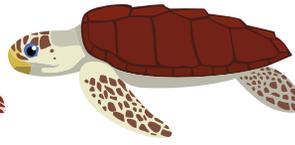
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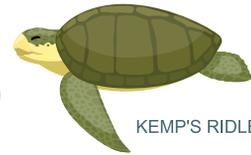
FLATBACK



HAWKSBILL



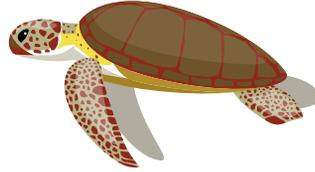
LOGGERHEAD



KEMP'S RIDLEY



LEATHERBACK



GREEN SEA TURTLE



OLIVE RIDLEY



1. What similarities do you see between the species of sea turtles?

2. What differences do you notice between the species of sea turtles?

3. How do you think the green sea turtle is able to migrate such long distances?

4. How might you test your hypothesis for turtle migration if you were a marine biologist?



It's been fun to learn about just a few of the marine creatures that live in and around the Great Barrier Reef this week! I wish we had time to learn about all of the hundreds of marine creatures we find there.

Me too! But there is at least one other creature that I wanted to talk about together. This creature belongs to the animal kingdom and is part of the Mollusca phylum. It has eight tentacle arms — can you guess what I'm talking about, Ben?

Hmm, an octopus?

You got it! It is called the mimic octopus, and it was discovered in 1998 near Indonesia. The mimic octopus can occasionally be spotted around the Great Barrier Reef.

While octopuses are known to be very intelligent and have the ability to change colors and patterns to camouflage into their surroundings, the mimic octopus goes a step further. This octopus can change its color, pattern, shape, and even its behavior to mimic other dangerous predators.

Mimic is a word that means to imitate or to act like something else. What creatures can the mimic octopus imitate, Hannah?

Well, this incredible octopus can mimic at least 15 other types of marine life, including the poisonous sea snake, sole, and the lionfish. When the mimic octopus is threatened, it quickly changes its shape, color, and behavior to scare away the threat or predator. But that's not all! The mimic octopus chooses to imitate the predator of the creature that is threatening it — how amazing is that!

Wow, God certainly gave this species of octopus an incredible amount of intelligence and talent! Its ability to mimic or imitate so well reminds me that we are to be imitators as well. But, unlike the mimic octopus that imitates many things, we are called to be imitators of God. Ephesians 5:1 tells us,

Therefore be imitators of God as dear children (NKJV).



That is a great reminder, Ben! The mimic octopus can imitate and behave like many different things around it. It can be easy for us to imitate or behave like other people around us too — but this can get us into trouble! Rather than imitate everyone around us, the Bible tells us that we are to be imitators of Christ.

Exactly. As we learn more from the Bible and our faith grows, our lives also begin to look more and more like Jesus. This is called sanctification (said this way: sāngk-tūh-fūh-kāy-shūn). Sanctification is the process God uses to purify us from sin as we learn and grow in Him. As we are sanctified, the more and more our lives will imitate Jesus.



Talk to your family about ways God is sanctifying all of you. Look up Ephesians 5:1 in your Bible. If you'd like, you can highlight this verse. Memorize Ephesians 5:1 with your teacher or with a sibling.



Ahoy, friend! Today is a special day — we're going to create our own model of the coral reef together.

There's only one thing I like better than adding a new page to my Science Notebook, and that is creating a model shoebox habitat!

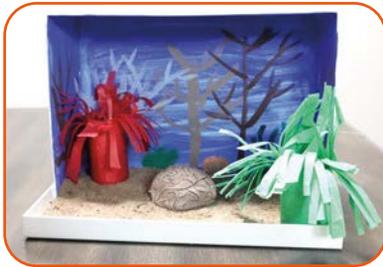
Good, I'm glad. I have our art supplies, the crafts we've worked on, a few model marine creatures, and a shoebox right here and ready to go. Let's get started! Have fun creating your coral reef model, friend, and don't forget to share what you've learned with someone else!

materials needed

- Shoebox
- Sand
- Plastic tablecloth
- Craft model brain coral, anemones from previous lessons
- Small model marine life (turtle, manta ray, fish, etc.)
- Hot glue gun (optional)

Activity directions:

1. Spread out a plastic tablecloth to protect your work surface.
2. Add sand to the bottom of the shoebox model.
3. Place your craft brain coral and sea anemones in the sand.



4. Add the small model marine creatures. Optional: If you'd like to add creatures to the upper part of your model, ask your teacher to help you hot glue them.



5. Share your coral reef model with your family. Be sure to tell them about the creatures you learned about, as well as the special designs God gave them.

Bonus! Take a picture of your coral reef model and ask your teacher to help you print it out. Then tape or glue the picture on the next page in your Science Notebook. Write **My Coral Reef Model** at the top of the page.



Answer Keys

Page 20

1. Answer will vary but should include something the student has enjoyed learning about science in the past.
2. Answer will vary but should include something the student wants to learn about in science.
3. A definition is what a word means.

Page 22

1. Science is the pursuit of knowledge and understanding about God's creation through an organized process. Science helps us to ask questions, test our ideas, and share what we've learned with others. Through science, we also learn more about God and our relationship with Him.
2. Definitions may vary based on the dictionary used.

Page 24

1. knowledge, understanding, creation, ask, test, share, God
2. Answer will vary, but student should list some fields of science they have heard about.
3. Answer will vary, but student should include the name of a scientist they have learned about in the past and their field of study.

Page 30

1. Answer will vary.
2. Answer will vary.

Page 32

All answers will vary.

Page 34

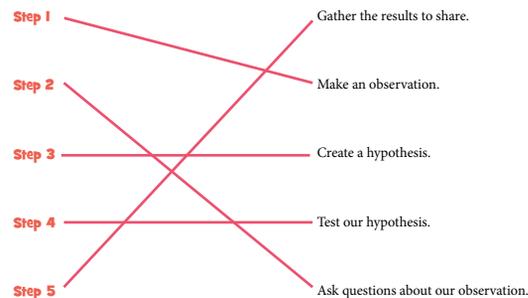
1. **Heliocentrism** — The theory that the earth is at the center of the solar system and that the sun and planets orbit the earth.
Geocentrism — The theory that the sun is at the center of the solar system and that the earth and planets orbit the sun.

2. Answers will vary, but student should explain why their five senses are or are not always trustworthy.

Page 38

Francis Bacon is recognized as the man who developed what we call the scientific method.

Page 40



Page 42

Experiment answers will vary.

Page 48

Obervation answers will vary.

Page 50

1. Answers will vary but may include: Lab reports help us to record and share information, questions, our hypothesis, and experiments.
2. Answers will vary but should include how a lab report can help us as we continue to explore science.

Page 60

Student should explain why they think it is important for measurements to stay consistent. All other answers will vary.

Page 62

Measurements will vary.

Page 64

All answers will vary.

Page 70

Student should explain why they think it is important for measurements to stay consistent. All other answers will vary.

Page 72

All answers will vary.

Page 82

All answers will vary.

Page 84

Observation answers will vary.

Page 92

All answers will vary.

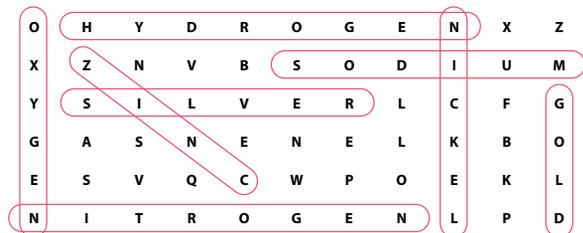
Page 94

Experiment answers will vary.

Page 100

1. Answer will vary.
2. 47
3. Answer will vary.

Page 104

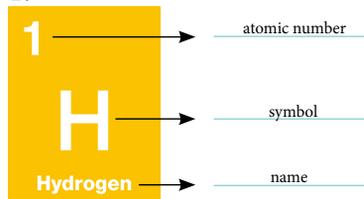


Page 110

Student should write names of elements they've learned or heard about before. Other answers will vary.

Page 112

1.



2. Answer may vary but should include that these gases don't react to other elements.

Page 114

1. Copper, 29
2. Aluminum, 13
3. Oxygen, 8
4. Iron, 26
5. Nickel, 28

Page 118

1. diatomic
2. molecule

Page 124

2. Answers may vary but should include that the number tells us the number of atoms.
3. b
4. H₂O₂

Page 128

1. Transpiration
2. Cycle
3. Evaporates
4. Answers may vary but should include water would be used up.

Page 132

All answers will vary.

Page 138

1. A mixture is two or more substances mixed together.

2. Observational science
3. Historical science
4. Observational science

Page 182

Note: terms may vary by Bible translation.

1. Heavens, earth, light, water
2. Sky/atmosphere, divided water
3. Dry land, plants
4. Sun, moon, stars
5. Sea creatures, flying creatures
6. Land creatures, mankind
7. God rested.
8. Answers may vary but should include that God created living things.

Page 184

1. Answer will vary.
2. Answer will vary, but student should list other ways they think we might be able to identify living from nonliving things.

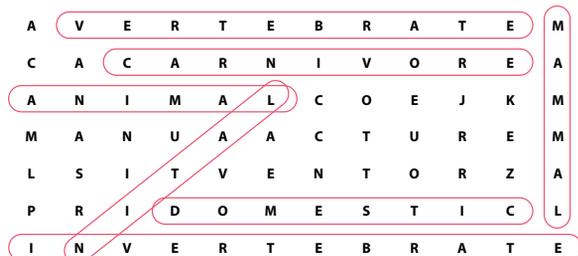
Page 186

1–5, wording and order may vary: respiration/ breathing, grow, reproduce, move/respond, eat/ absorb nutrients

Page 196

1. Animal, vertebrate
2. Answers will vary, but student should describe what the backbone feels like.
3. Humans are made in the image of God.

Page 198



Page 202

1. A marine biologist studies the ocean and the life it contains.
2. Answers will vary, but student should describe what they think it would be like to be a marine biologist.
3. Answers will vary, but student should include something they would like to learn about the ocean or marine life.

Page 204

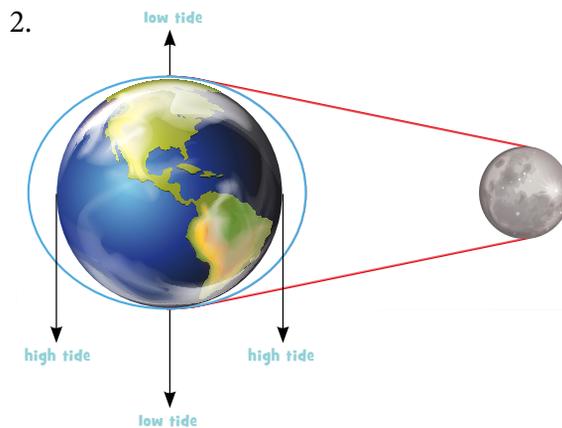
Observation answers will vary.

Page 212

Observation answers will vary.

Page 216

1. Answers may vary but should include the moon or the moon's gravitational pull on the earth.



Page 220

2. The intertidal zone
3. A community of living and nonliving things that are together in one place.

Page 222

- 1–2. Answers will vary.
3. To be able to adjust or change for certain conditions or a particular place.
4. Answers may vary but should include that conditions are always changing.

Page 236

1. Plant, Animal, Protista
 2. Protista
 3. Answers may vary, should include that algae produces oxygen, even more oxygen than plants.
- 4–5. Answers will vary.

Page 238

Answers will vary.

Page 244

1. Answers will vary, but student should describe what they think it would have been like to live in God's original creation where animals and people ate only plants.
2. Answers may vary depending on the Bible translation but should include that the fear and dread of people would fall on the animals.
3. Answers may vary, but student should include what they think it would have been like to see a lion, tiger, bear, or dinosaur before it was afraid of people.

Page 246

1. Primary producers
2. Omnivore
3. Herbivore
4. Carnivore

Page 254

1. Fringing reef
2. Atoll
3. Barrier reef

Page 258

1. Answers may vary but should include: A relationship in which two organisms receive a benefit from each other.
2. Answers will vary, but student should include other relationships in creation

where two living things receive a benefit from each other (e.g., bees and flowers).

3. Answers will vary, but student should include why they think God may have designed mutualistic relationships in creation.

Page 266

1. Answers will vary, but student should include what similarities they see between the species of sea turtles.
2. Answers will vary, but student should include what differences they notice between the species of sea turtles.
3. Answers will vary, but student should include how they think the green sea turtle is able to migrate such long distances.
4. Answers will vary, but student should include how they might test their theory of turtle migration if they were a marine biologist.

Page 270

1. Answers may vary.
2. Hair on their bodies, feed their babies milk, need oxygen to breathe, and are vertebrates.
3. Humans are made in the image of God.

Page 272

1. The parts of a body.
2. Answers may vary but should include that a whale's rib cage is flexible, which allows it to dive deep in the ocean.

Page 274

1. Answer will vary, but student should have written down how long they can hold their breath.
2. Answer will vary, but student should include how they think a sperm whale is able to hold its breath for 45 minutes.