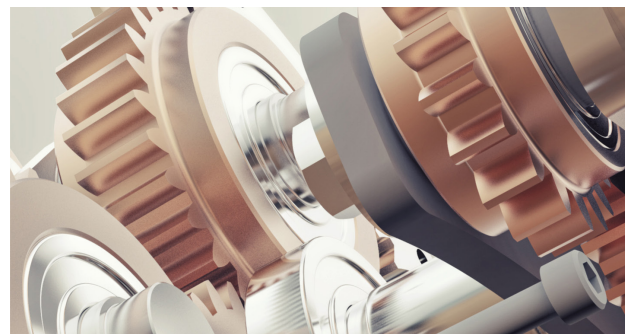


C FORCES AND INTERACTIONS, LIFE SYSTEMS AND CYCLES, WEATHER & CLIMATE, AND ENGINEERING DESIGN



FUN FACT

Ruth Wakefield invented chocolate chips (and chocolate chip cookies!) in 1930.





Thank you for downloading this sample of Sonlight's Science C Instructor's Guide (what we affectionately refer to as an IG). In order to give you a full perspective on our Instructor's Guides, this sample will include parts from every section that is included in the full IG.

Here's a quick overview of what you'll find in this sample.

- A Quick Start Guide **START HERE**
- A 3-week Schedule
- Activity Sheets and Parent Answer Keys
- A Weekly Subject List

SONLIGHT'S "SECRET" COMES DOWN TO THIS:

We believe most children respond more positively to great literature than they do to textbooks. To properly use this sample to teach your student, you will need the books that are scheduled in it. We include all the books you will need when you purchase a package from sonlight.com.

Curriculum experts develop each IG to ensure that you have everything you need for your homeschool day. Every IG offers a customizable homeschool schedule, complete lesson plans, pertinent activities, and thoughtful questions to aid your students' comprehension. It includes handy teaching tips and pointers so you can homeschool with confidence all year long.

If you need any help using or customizing our IGs, please reach out to our experienced homeschool advisors at sonlight.com/advisors.

We hope you enjoy using this sample. For even more information about Sonlight's IGs, please visit: sonlight.com/ig. It would be our pleasure to serve you as you begin your homeschool journey. If you like what you see in this sample, visit sonlight.com/science to order your Science package.

Blessings!

Sarita Holzmann,
Co-founder and president
of Sonlight Curriculum

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Science (4-Day)

Forces and Interactions, Life Systems and Cycles, Weather & Climate,
and Engineering Design

By the Sonlight Team

*“Then God said, ‘Let us make man in our image,
in our likeness, and let them rule over the fish of
the sea and the birds of the air, over the livestock,
over all the earth, and over all the creatures that
move along the ground.’”*

Genesis 1:26 (NIV)

Sonlight Curriculum® Science C “Forces and Interactions, Life Systems and Cycles, Weather & Climate, and Engineering Design” (4-Day) Instructor’s Guide and Notes, Twenty-fourth Edition

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“Do to others what you would have them do to you” (Matthew 7:12).

“The worker is worth his keep” (Matthew 10:10).

Published by

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NOTE TO PURCHASER

Sonlight Curriculum, Ltd. is committed to providing the best homeschool resources on the market. This entails regular upgrades to our curriculum and to our Instructor’s Guides. This guide is the 2021 Edition of the Sonlight Curriculum® Science C “Forces and Interactions, Life Systems and Cycles, Weather & Climate...” (4-Day) Instructor’s Guide and Notes. If you purchased it from a source other than Sonlight Curriculum, Ltd., you should know that it may not be the latest edition available.

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For the latest information about changes in this guide, please visit www.sonlight.com/curriculum-updates. Please notify us of any errors you find not listed on this site. E-mail corrections to IGcorrections@sonlight.com and any suggestions you may have to IGsuggestions@sonlight.com.

Table of Contents

1 Introduction to Your Instructor’s Guide

- Table of Contents
- Quick Start Guide
- Introduction
 - Welcome
 - Evolution and the Age of the Earth
 - Student Activity Sheets
 - A Few Other Helpful Hints
 - A Practical Suggestion for Experiments
 - Supplementary Websites
 - Corrections and Suggestions Summary

2 Schedule, Notes and Activity Sheets

- A Weekly SCHEDULE for Science
- ACTIVITY SHEET ANSWER KEYS

3 Appendices

- Appendix 1: Science C—Weekly Subject List

INSTRUCTOR'S GUIDES

SCIENCE

Special features of Sonlight's Science Instructor's Guides:

1 COMPLETE, READY-TO-USE LESSON PLANS

All your science books and experiments are fully scheduled for the entire year. The IG provides the framework for what books to read and when, what experiments to do and what videos to watch. No need to create your own lesson plans!

2 DETAILED TEACHING NOTES

Notes explain each assignment and activity, point out fun facts about your reading, include question prompts, explanations, hands-on activities (beyond the experiments), and additional notes to enhance the reading and reinforce what your students are learning.

3 ORGANIZATIONAL TOOLS TO HELP YOU PLAN AHEAD

See at a glance the supplies you need for experiments this week and the following week. Know what supplies you'll find in the Sonlight Science Kits, and which household items you'll want to have ready.

4 WEEKLY ASSIGNMENTS AND ENGAGING ACTIVITIES

Simple, engaging experiments coordinate with your weekly reading. NEW: In levels K-C, these weekly experiments tie *directly* to that week's reading material for an even more linear progression from reading to doing. Experiments provide hands-on learning and reinforce and apply the concepts studied in the days previous so you can see your child's developing mastery of particular science concepts.

Most of the experiments can be done with common household items, but to minimize

Level K: Science

Days 5-8: Date: _____ to _____

Week Overview																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

Week 2				
Date:	Day 5	Day 6	Day 7	Day 8
Ants	pp. 10-13	pp. 14-15	pp. 16-17	
Activity Sheet Questions	#1-3	#4	#5-6	
Discover & Do Science: Kindergarten Experiments				Experiment #2 How Do Ants Walk?
Do Together		Growing Up		
Supplies				
	Kindergarten Supplies Kit: clay (enough to make three quarter-sized pieces), 2 pipe cleaners. You Provide: scissors that can cut pipe cleaners, ruler (optional).			
Shopping/Planning List				
	For next week: 1 cup of warm water, 1 tsp sugar, a small clear plastic bottle with a narrow mouth.			
Additional Subjects:				

Ants

Day 5 pp. 10-13

The natural world is very violent. It can be distressing to imagine defending yourself or being hurt by attackers. Now may be a good time to introduce personal safety and remind

Day 6 pp. 14-15

You are probably already familiar with the idea that caterpillars spin cocoons so they can turn into butterflies, but many ants do too! What stages of development have you gone through? (e.g. growing inside your mommy, baby, toddler, and now in school!)

Day 3 pp. 10-11

Do you own a globe? If not, you can also use a ball, such as a basketball or soccer ball, to demonstrate the concept of day and night. All you need is a globe or ball and a flashlight. The flashlight, naturally, represents the Sun. Shine the flashlight on one side of the globe or ball. The part of the world facing the light is experiencing day, while the other areas are experiencing night. But the world rotates, so as it turns, day turns to night on one part of the globe, while night turns to day in other areas. [p. 10]

Day 4 pp. 12-13

The book refers to the northern and southern hemispheres but does not explain the concepts of western and eastern hemispheres. You might want to show your children a world map, noting the northern and southern hemispheres, as divided by the equator, while also pointing out the western hemisphere (North and South America and the Pacific and Atlantic Oceans) and the eastern hemisphere (Europe, Africa, Asia, Australia). [p. 13]

Day 5 pp. 14-15

Occasionally, you'll notice short experiment suggestions such as "Make a rainbow" on page 15. Please consider these activities as optional.

Activity Sheet Questions

Day 1 #1-2

Note to Mom or Dad: Find each week's Activity Sheets immediately after the notes and answer the questions assigned on the schedule page. Each Activity Sheet has a corresponding Answer Key page at the end of each week's notes.

- You do not have to do every question on the Activity Sheets.
- Feel free to adjust and/or omit activities to meet the needs of your children.
- We cover the same concepts repeatedly throughout the

challenge your children. Feel free to let your children do those activities they enjoy and simply talk through others. We have provided space for you to fill in answers as your children respond verbally, or simply check off the items that you discuss.

Suggestion: your Activity Sheets might work more easily in a small binder for your children to keep and use as assigned. If you have more than one child using this program, extra Activity Sheets can be purchased for each child (Item #ASG1).

Occasionally we assign a "Cut-Out" activity. Please find these separate sheets in Section 3.

Discover & Do Level K DVD

Day 2 "Before you Begin" Tracks #1-3

We produced this fun and educational video so you and your children could watch "Professor Ike" perform each of the assigned experiments from *The Usborne Book of Science Activities, Vol. 2*. We recommend you gather your supplies, watch the DVD to see what to do, and then try each of these simple experiments yourself.

Or, if you prefer, you can do the experiment(s) on your own and then watch the DVD to see how it turned out on screen. You may want to mix and match to find out which works best. We hope this video makes your science experiments more enjoyable and more educational.

If your experiments don't happen exactly as you see in the video, it's OK! Watch the Outtakes in the Bonus section of the DVD and see how things didn't always happen perfectly for us, either.

Note: Please navigate your *Discover & Do Level K DVD* by using the DVD menu on your screen.

Science Activities, Volume 2

Day 2 "Air All Around" pp. 2-3

If you remember school science experiments as boring demonstrations without making much of a point, it's time for you and your children to try *The Usborne Book of Science Activities, Vol. 2*. Packed with simple activities and experi-

prep time, we've created a Science Supplies Kit that includes many of the supplies you need to conduct each experiment. No planning necessary and minimal prep time!

Your children will relish the discoveries they make throughout the year. And you'll love that they are actively exploring STEM (Science, Technology, Engineering, Math) concepts, and making their learning stick.

Instructor's Guides K-J also include:

5 INTERACTIVE ACTIVITY SHEETS

Your Activity Sheets—with hundreds of activities, illustrations, charts, and pictures—help your children remember what they've learned. A variety of activity options coordinate with your students' science studies and draw on a range of skills and interests.

Activities progress with your children's abilities: from cutouts, matching, circle-the-answer, and dictation, to fill-in puzzles and sequencing analysis.

6 COMPLETE ANSWER KEYS

Separate Answer Keys mirror your Student Activity sheets for easy grading. No need to test—you have ongoing, reliable insight into your children's comprehension. ☀️



“Celebrating our last day of school by looking at all the books we read and learned from! **We love the instructor's guide and all the books!! 100% happy with Sonlight!!**” Jennie W of Puryear, TN. Pictured: Aidan (9, Level D), and Abigail (11, Level F).

Science A: Week 1 Activity Sheet

4. **Challenge:** Make the statement true. (Please find Cut-Out #1 in the Appendix.) (p. 10)

The Sun rises in the and sets in the .

5. Can you name the four seasons? (p. 12)


1) _____ 2) _____

3) _____ 4) _____

6. Use the map to help you answer. (Please find Cut-Out #2) (p. 13)


North America

When it is summer in:



...it is winter in:

7. During which two seasons does the Earth tilt toward or away from the Sun? Circle them. (p. 13)



winter spring summer fall

Week 1 Activity Sheet | 5-Day | Biology, Botany, and Physics

Students would be able to have fun with this activity, as your children learn more about how the seasons change in your particular area. When they're done, proudly display their work of art on the refrigerator or a wall where everyone can see it.

Science A: Week 1 Activity Sheet

4. **Challenge:** Make the statement true. (Please find Cut-Out #1 in the Appendix.) (p. 10)

The Sun rises in the East and sets in the West.

5. Can you name the four seasons? (p. 12)


1) spring 2) summer

3) fall 4) winter

6. Use the map to help you answer. (Please find Cut-Out #2) (p. 13)

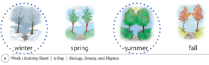
North America

When it is summer in:



...it is winter in:

7. During which two seasons does the Earth tilt toward or away from the Sun? Circle them. (p. 13)



winter spring summer fall

Biology, Botany and Physics | 5-Day | Section Two | Week 1 | 3

TRY BEFORE YOU BUY!
Get a three-week sample of any
Sonlight Instructor's Guide—FREE!



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Welcome!

In Science C, you will learn about historical and mechanical technology (how things are made); geology (rocks and minerals); meteorology; microscopy; and general experimental science.

Sonlight Science programs include introductory studies in a range of experimental sciences. The main point of all the reading, activities, and (if you choose) experiments is to introduce your children to the scientific method and the joy of discovery.

We want children to be *introduced* to a lot of different subjects, *intrigued* by the concepts and ideas, and *enticed* to come back to the same themes again in the future. So, you will find we follow a spiral pattern of education, touching on certain topics repeatedly this year and again in future years.

In this way the basic *vocabulary* of science becomes ingrained not only in short-term, but also long-term memory. “Oh, yeah. I vaguely remember hearing about pistils and stamens earlier this year,” a child may say late in the program. When the child studies biology again in future programs, the names and concepts will be vague, but recognizable, as the child gains deeper understanding. Please don’t expect mastery of the vocabulary at this age. That will come in time.

We want our children to *remember* what they have learned because they can’t help it; because they want to. We don’t want them merely to *memorize* what they are supposed to learn so they can pass a test.

The science experiments in this package, although not larger than life, work well.

As you do the experiments and demonstrate care in reading and following directions, recording data, and more, your children learn to follow your lead. An attitude of success—“Sure. We can do this!”—rubs off as well. These behaviors cannot be taught simply by reading books; they have to be modeled.

One quick note before you begin: The experiments don’t coordinate with the other science reading. We have not found any single book that coordinates great information and exciting illustrations (as found in the majority of our science books) with great hands-on activities and experiments. We believe we have selected the best cluster of books for both interest and excitement, but know up front: the science reading will not match the experiments.

My Downloads

Find extra schedule pages, new user information (how to use a Sonlight guide) and further helpful information specific to the guide you have purchased from Sonlight on our website: www.sonlight.com. Go to Your Account and select the Downloads section to find all of the downloads for your guide.

Evolution and the Age of the Earth

Two science-related issues require some special attention. The first has to do with evolution, while the second relates to the age of the Earth.

Evolution

Some of the book selections in our science programs contain material supportive of evolution. Why do we include these books? First, we include them because the majority of the content in these resources is of high quality, offering visually and intellectually appealing material. Second, we don’t take an isolationist approach to knowledge. The subject of evolution is not something we want to teach children to avoid or put down without adequate understanding. Third, as the dominant perspective in contemporary science, evolution deserves mention and attention, even from those who disagree with its arguments. With that said, we do our best to provide balanced perspectives in relation to any potentially divisive content, such as evolution.

When it comes to evolution, there are a few important points to keep in mind. In particular, differences between *macroevolution* and *microevolution* are crucial. These terms are sometimes used to clarify what is meant by evolution. *Macroevolutionists* accept evolution as the overarching explanation for all life, believing that evolution is responsible for significant changes in life forms such as a land-based mammal changing into an ocean-going mammal or dinosaurs allegedly evolving into birds. These supposed evolutionary changes are big, hence the term *macro*, meaning something very large in scale, is used in reference to this kind of evolution.

Microevolution, however, refers to small changes within different kinds of life. This approach grants the reality of changes within kinds, such as birds or dogs. Obviously, there are many kinds and sizes of birds and dogs, but despite the variations, these creatures remain birds and dogs. As a result, someone can adhere to *microevolution* without granting all the beliefs of *macroevolutionists*, who tend to accept the basic underlying principles of Darwinian evolution.

Religious objections to evolution tend to stem from the accusation that *macroevolution* leaves God out of the picture, instead leaving the entire process of the emergence and development of life to chance and time. Of course, this means that evolution is undirected by any sort of intelligence, while Christianity, for instance, believes in the reality of the existence of God as Creator. In other words, one approach to evolution is based on a world view known as *naturalism*, while another is based on *theism*.

Naturalism here does not refer to enjoying nature, as in being a naturalist, but in a world view that denies the existence of anything beyond the material world. In other words, anything supernatural, such as the existence of God, is rejected by naturalists.

Theistic evolutionists accept the existence of God, but view Him as being active in the process of evolution. Christian theistic evolutionists may appeal to Scripture supporting God's active involvement in His creation (such as 1 Corinthians 8:6, Hebrews 1:3, etc.). In areas where a naturalist sees random processes and events, the theistic evolutionist argues that God is actively involved in directing matters.

Theism accepts that there is more to reality than the material world. There is a supernatural world, and God exists as a personal being, active in His creation. By definition, naturalism excludes God. Christian theists who reject macroevolution and theistic evolution argue that God is Creator and Designer, having made all life without resorting to any macroevolutionary processes.

Scientific objections to *macroevolution* include, for instance, allegations that the fossil record lacks transitional forms, that genetic mutations are commonly harmful not helpful, and claims that life shows signs of intelligent design.

One goal we have at Sonlight is to present fair and balanced perspectives on issues, including science and evolution. As a result, some of the materials we choose to utilize will, at times, present evolutionary points of view, while other selections will not. As the parent, we encourage you to provide guidance for your children on these topics. In our assessment, it's better for your children to have some exposure to controversial topics at home, with intelligent and caring guidance, rather than have them be surprised by ideas they will eventually encounter anyway.

The Age of the Earth

Another issue that will come up in the course of studying science has to do with questions about the age of the Earth. Secular books in some of our science programs will at times refer to "millions" or "billions" of years. For Christians who hold to a young Earth perspective, believing the Earth may only be several thousand years old rather than billions, such phrasings pose a problem.

We suggest two solutions. First, whenever you encounter "millions" or "billions" in a science book, feel free to rephrase the sentences in question with phrases such as "a long time," "a very long time," or variations of this phrasing. Second, you may wish to state that although the book uses millions and billions of years, there are other perspectives on the age of the Earth and the age of the universe.

If your children ask why there is disagreement on the age of the Earth and/or universe, you can explain that not everyone interprets the data in the same way and not everyone employs the same research methods or believes in the same data. Young Earth creationists, for example, include their interpretation of the Bible as a primary source of data. Those who hold to an old Earth tend either to ignore the Bible (if they are non-Christian) or interpret the biblical creation account in such a way that allows for an old Earth without diminishing essential Christian doctrine. From this old Earth perspective, the Bible may be a supplementary witness regarding the question of the age of the Earth, but traditional interpretations of it in reference to the age of the Earth need to remain open to reinterpretation.

You may also wish to add, "We aren't sure about how old the Earth is, but I happen to believe ..." Then state your position on the matter.

Our goal here is not to present a definitive position on the age of the Earth or to present nuanced arguments for each side in the debate, but to leave it to you, as the parent, to discuss with your children as you see fit.

Discussion and disagreement about the age of the Earth leads to another important point: is a particular view of the age of the Earth an essential Christian doctrine? Sometimes, nonessential beliefs can lead to problems with essential beliefs, so this point needs to be approached carefully and thoughtfully. In general, however, we would do well to follow the maxim, "In essentials unity, in nonessentials liberty, and in all things charity." In other words, we should foster Christian unity on essentials, rather than division about nonessentials.

Student Activity Sheets

Behind each week's notes, you will find Activity Sheets to reinforce what you are teaching and engage your student. Each Activity Sheet lists the week it is used at the top of the page. The questions coordinate with what you are reading and each activity is assigned on the schedule page.

It is not necessary to complete every activity provided. These are merely suggestions and you, as the teacher, can determine which are best suited for your children. You will find a variety of activities included in the Activity Sheets that are designed to draw on different skills and interests. Please feel free to assist your children by doing the hard work of handwriting the answers.

We have also included corresponding Instructions and Answer Key pages for all activities. You may want to file the Activity Sheets in a separate binder for your student's use.

Note: If you might reuse your Instructor's Guide and Student Activity Sheets in the future (for a younger child, for instance), we strongly suggest that you purchase an extra set of Activity Sheets when you buy the Instructor's Guide. That way, when we update our Instructor's Guides you will have matching Activity Sheets when you need them. Please contact us if you are looking for Activity Sheets from the past.

A Few Other Helpful Hints

1. Write or color first, then cut out. Small pieces of paper are hard to work with, even if your children have fully developed fine motor skills. Eliminate some frustration for your children (and mess for you!) by cutting out pieces last.
2. Assist with cutting! Always be sure to help your children with scissors. Safety scissors with rounded tips are best (especially for younger children), but they can still cause damage to items you'd rather not cut, or even to children themselves. Cut with care as a pair! **Also:** a few of the pieces may be small or require

a little fancier scissor work. We recommend that an adult cut out these pieces (to prevent frustrating your children), or share the cutting project—give your children some to do (larger, more basic pieces) while you work on the harder ones.

3. Resist the temptation to do it all! No matter how prepared you'd like to be for a day of teaching, don't think that you need to cut things out ahead of time. Your children will love to help! Not only will they achieve a sense of accomplishment when they have finished, but they are also learning a valuable life skill while developing their fine motor skills.

A Practical Suggestion for Experiments

Please be aware that some of your books may imply that an experiment will knock your socks off: the results will be bigger than life. The reality, we've found, is rarely so exciting. Often what you should be looking for is a very small change. The experiments suggested in your books are basic ideas. Try them; improve them! If you figure something out that works better than the instructions in your book, please tell us! Some experiments work every time; some may take several tries. Even the most famous scientists have had to try the same (or similar) experiments over and over. If an experiment does not work the first time, please try again.

Supplementary Websites

We know that there are times throughout our curriculum when we simply cannot cover all the material on a given subject. In these instances we will provide internet search instructions for you to find more information. Please use caution and your own discretion as you look at different internet sites. We highly recommend that you as the parent and teacher look before allowing your student to do the search with you or on their own. We hope you find this helpful!

Corrections and Suggestions

Since we at Sonlight Curriculum are constantly working to improve our product development, we would love it if we could get you to help us with this process.

Whenever you find an error anywhere in one of our Instructor's Guides, please check our updates page for the latest information at www.sonlight.com/curriculum-updates. Report new information by sending a short e-mail to: IGcorrections@sonlight.com. It would be helpful if the subject line of your e-mail indicated where the problem is. For instance, "Science C/Section Two/Week 1/Schedule."

If, while going through our curriculum, you think of any way we could improve our product, please e-mail your suggestions to: IGsuggestions@sonlight.com. If you know of a different book we should use, if you think we should read a book we assign at a different point in the year, or if you have any other ideas, please let us know.

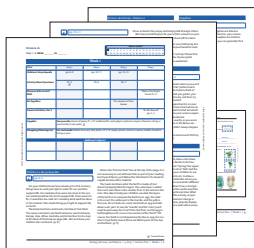
Summary

We hope that you enjoy your adventure this year and that it helps you learn more about the world we live in. If we can be of any assistance, please do not hesitate to e-mail us at main@sonlight.com, call us at (303) 730-6292, or better yet, join our Sonlight Connections Community (sonlight.com/connections), where you can chat with others who are going through this same program. You can ask questions, learn new ideas, share with others what you have learned, problem-solve, or just talk. Happy exploring! ■

Quick Start Guide—Science

The Sonlight Instructor's Guide (IG) is designed to make your educational experience as easy as possible. We have carefully organized the materials to help you and your children get the most out of the subjects covered. Subjects are interwoven to avoid redundancy and to get the most out of your day.

This IG includes an entire 36-week schedule, notes, assignments, readings, and other educational activities. Sonlight's unique literature based approach to education promotes an enjoyable learning experience that will keep your children asking for "just one more chapter, please." What helpful features can you expect from the IG?

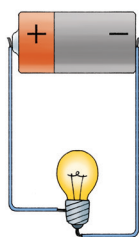
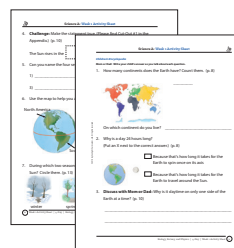


Easy to use

Schedule pages are laid out so a quick glance will tell you exactly what to do each day. Check off each assignment as you go to create instant records. Notes for each book follow directly behind the schedule page.

Activity Sheets

Engage your students with easy-to-follow Activity Sheets to express their growing knowledge as they explore and discover. Same-view answer keys make it easy to check your student's work.



Science Experiments

Truly explore with hands-on science experiments. Sonlight Science Supply kits contain the hard-to-find materials to complete science experiments.

Notes

When relevant, you'll find notes about specific books to help you know why we've selected a particular resource and what we hope children will learn from reading it. Keep an eye on these notes to also provide you with insights on more difficult concepts or content (look for "Note to Mom or Dad").

Day 10 Disaster Relief

Discuss the various weather-related disasters that have occurred in your area in recent memory. Have there been tornadoes? Hurricanes? Floods? Drought? Talk with your children about how people are affected by these disasters. Also discuss what ways—if any—are available to avoid or lessen the effects of such disasters. Finally, brainstorm ideas of how your family might be able to help people affected by recent weather-related disasters (or ones yet to come). Could you donate money or supplies needed by



Instructor's Guide Resources and New User Information

Don't forget to familiarize yourself with some of the great helps you get when purchasing a guide from Sonlight. In the **My Downloads** section of your Sonlight Account, you will find New User Information, extra schedule pages, field trip planning sheets and so much more. An overview of topics covered is located in **Section Three** of the guide.

Section Two

Schedule, Notes, and Activity Sheets

Science C

Days 1–5: Date: _____ to _____

Week Overview																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

Week 1

Date:	Day 1	Day 2	Day 3	Day 4
DK Did You Know? Science	pp. 6–9	pp. 10–13	pp. 14–17	
Activity Sheet Questions	#1–4	#5–8	#9–16	
Discover & Do: 3rd Grade Science Experiments				#1: Do Insects Look the Same at Each Life Cycle?
The Story of Inventions				
Do Together	List It	Sort It		
Supplies	We Provide (3SK): 1/4 cup clay, Green Leaf & Blue Water Templates, Butterfly & Dragonfly Templates, ping-pong ball, 1 pipe cleaner You Provide: scissors, colored pencils or markers, ruler			
Shopping/Planning List	For Next Week: a spoon, 8 to 10 small cereal pieces, a drinking glass or cup, a timer, a pencil			
Additional Subjects:				

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DK Did You Know? Science

Day 1

pp. 6–9

For the first part of the year, your children will study biology. The term “biology” comes from two Greek words: bio- means ‘life’ and -ology means ‘study.’ So, biology is the study of life. But biology does not just study things that are alive now; it also studies anything that ever was alive, including dinosaurs and other extinct animals and plants. Many different fields of study fall under the umbrella of biology, like zoology, ecology, and botany, and cover specific subjects like reproduction, cell division, and heredity. Because so much of our incredible world is alive, biology also has many sub-sciences where other science disciplines mix with biology. For example, biochemistry is the study of what chemicals make up living things. Biophysics focuses on understanding and solving biological problems with physics. [pp. 6–7]

Day 2

pp. 10–13

The tardigrade is a fascinating organism that is often called a “water bear,” although that term doesn’t do it justice. This resilient microorganism has been found in the deep ocean, ponds and lakes, and even hot springs! It can survive boiling water to frozen water and everything in between. It withstands radiation, incredible amounts of pressure found in the deepest ocean trenches, and even the vacuum of space! [p. 11]

Day 3

pp. 14–17

While most bacteria do not make us sick, it is not fun when they do. Bacteria make people sick in several different ways. They can multiply and crowd out healthy tissue, release toxins that damage healthy tissue, and can cause the immune system to ramp up its defenses. Fever, aches, and/or rashes are possible signs that our immune system

Parental Notes

is fighting an infection and may not actually be symptoms of the infection itself. [pp. 14–15]

Day
2

Sort It

Do Together


Day
1

List It

The book states that there are approximately 8.7 million different living things on Earth! How many can your child name? Today, allow your child to compose (or dictate to you) a list of as many specific living things as he/she can think of. Feel free to set a 3-5 minute time limit on this activity. You will use this list tomorrow!

Today your children learned that all animals can be categorized into one of six groups. Review the list of living things that your child came up with yesterday and together determine which ones are animals. Circle all of the living things that are animals, eliminating plants/fungi. Then, work together to create a chart listing the 6 groups across the top (amphibians, fish, mammals, reptiles, birds, and invertebrates). Go through the list of circled animals and categorize each one into its proper group. Can your children add any other animals? ■




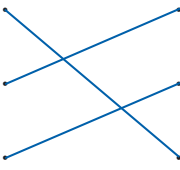
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Science C: Week 1 Activity Sheet 

Did You Know? Science

1. Why do we study science? (p. 6)
 Science helps us (answer questions)
 and understand (how and why things work)

2. Draw a line to match the scientific areas of study to the topics each studies. (pp. 6–7)

 Physics  Biology  Chemistry		living things materials, and what things are made from movement and forces, like gravity, light, electricity, magnets, waves, and more
--	---	--

3. Someone who studies physics will learn about which of the following? (Draw an X to show your answer.) (p. 6)

<input checked="" type="checkbox"/> energy	<input type="checkbox"/> cells	<input checked="" type="checkbox"/> sound	<input checked="" type="checkbox"/> magnets
<input type="checkbox"/> atoms	<input type="checkbox"/> rocks	<input checked="" type="checkbox"/> light	<input type="checkbox"/> fossils


4. All things are made from: (p. 7)

water	<u>atoms</u>	wood	metal
-------	--------------	------	-------


5. What basic things do you need to survive? (pp. 10–11)

<u>(water)</u>	<u>(air)</u>
<u>(food)</u>	<u>(shelter)</u>
<u>(light)</u>	







Forces and Interactions, Life Systems and Cycles, Weather & Climate ... | Week 1 Activity Sheet **1**


Science C: Week 1 Activity Sheet 

6. In what two ways does the sun help us survive? (p. 11)

(provides heat) (provides light) 


7. For each animal, write the name of the group to which it belongs on the line. (pp. 12–13)

mammal	reptile	amphibian	bird	fish	invertebrate
 duck <u>(bird)</u>				 spider <u>(invertebrate)</u>	
		 frog <u>(amphibian)</u>		 shark <u>(fish)</u>	
	 alligator <u>(reptile)</u>			 koala <u>(mammal)</u>	


8. Are all living things considered animals? (p. 13) Yes No 

Explain: (Plants and fungi are living things, but they are not animals)


Week 1 Activity Sheet | Forces and Interactions, Life Systems and Cycles, Weather & Climate ... **2**

Science C: Week 1 Activity Sheet 


9. Bacteria are made of one cell, and can be one of three different shapes. Label each shape below. (p. 14)



(rod-shaped)




(circular)



(spiral)

10. Check all that apply: Microorganisms are... (p. 14)

<input checked="" type="checkbox"/> living things scientists can see with a microscope	<input type="checkbox"/> big
<input checked="" type="checkbox"/> bacteria	<input checked="" type="checkbox"/> viruses and some fungi

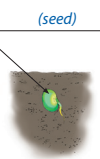


11. True or False: All bacteria are bad. (p. 14) **True** **False**

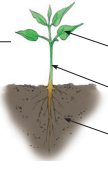
12. Why are new plants able to grow from seeds? (p.16)
(Seeds are little packets that contain everything a plant needs to start)

13. Label the parts of the seedling. (pp. 16-17)

first leaves	roots
seed	stem



(seed)




(first leaves)

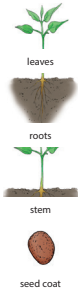
(stem)

(roots)

Forces and Interactions, Life Systems and Cycles, Weather & Climate ... | Week 1 Activity Sheet 3

Science C: Week 1 Activity Sheet 

14. Draw lines to show how each plant feature helps the plant. (pp. 16-17)



Help anchor the plant. Supplies the plant with water and nutrients from the soil.

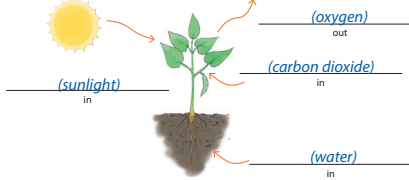
Protects the seed until it's ready to start growing.

Contain chlorophyll that absorbs energy from the sun. The energy helps the plant make food.

Brings water from the ground to the rest of the plant.

15. Label the plant to show how photosynthesis occurs. (pp. 16-17)

water	oxygen	sunlight	carbon dioxide
-------	--------	----------	----------------



(sunlight) in


(oxygen) out

(carbon dioxide) in


(water) in

Why is photosynthesis important? (It's how the plant makes glucose which it uses for energy to grow.)

Week 1 Activity Sheet | Forces and Interactions, Life Systems and Cycles, Weather & Climate ... 4

Science C: Week 1 Activity Sheet 

16. It is a sunny but windy summer day, and you're playing in your yard. The flowers are swaying back and forth near your house. Several days later, you notice new flowers growing in the back edge of your yard, where flowers have never grown before. How could this have happened? (p. 17)



(The wind might have carried the seeds to another place in the yard where they were able to start growing.)

Forces and Interactions, Life Systems and Cycles, Weather & Climate ... | Week 1 Activity Sheet 5



Did You Know? Science

1. Why do we study science? (p. 6)

Science helps us _____
and understand _____



2. Draw a line to match the scientific areas of study to the topics each studies. (pp. 6–7)



Physics



Biology



Chemistry

•

• living things

•

• materials, and what things are made from

•

• movement and forces, like gravity, light,
electricity, magnets, waves, and more

3. Someone who studies physics will learn about which of the following? (Draw an X to show your answer.) (p. 6)

_____ energy

_____ cells

_____ sound

_____ magnets

_____ atoms

_____ rocks

_____ light

_____ fossils

4. All things are made from: (p. 7)

water

atoms

wood

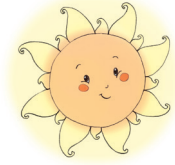
metal

5. What basic things do you need to survive? (pp. 10–11)



Science C: Week 1 Activity Sheet

6. In what two ways does the sun help us survive? (p. 11)



7. For each animal, write the name of the group to which it belongs on the line. (pp. 12–13)

mammal	reptile	amphibian	bird	fish	invertebrate
---------------	----------------	------------------	-------------	-------------	---------------------



duck



spider



frog



shark



alligator



koala

8. Are all living things considered animals? (p. 13)

Yes

No

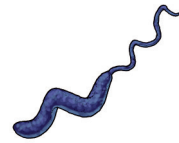
Explain: _____



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9. Bacteria are made of one cell, and can be one of three different shapes. Label each shape below. (p. 14)



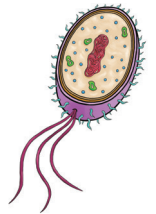
10. Check all that apply: Microorganisms are... (p. 14)

living things scientists can see with a microscope

big

bacteria

viruses and some fungi



11. True or False: All bacteria are bad. (p. 14)

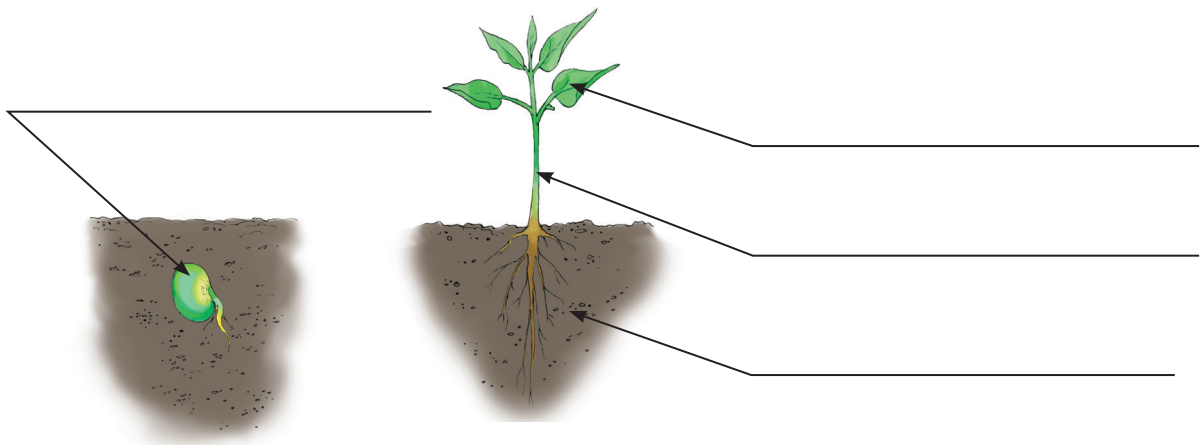
True

False

12. Why are new plants able to grow from seeds? (p.16)

13. Label the parts of the seedling. (pp. 16–17)

first leaves	roots
seed	stem



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Science C: Week 1 Activity Sheet

14. Draw lines to show how each plant feature helps the plant. (pp. 16–17)

	•	•	Help anchor the plant. Supplies the plant with water and nutrients from the soil.
leaves			
	•	•	Protects the seed until it's ready to start growing.
roots			
	•	•	Contain chlorophyll that absorbs energy from the sun. The energy helps the plant make food.
stem			
	•	•	Brings water from the ground to the rest of the plant.
seed coat			

15. Label the plant to show how photosynthesis occurs. (pp. 16–17)

water	oxygen	sunlight	carbon dioxide
--------------	---------------	-----------------	-----------------------

_____ out
 _____ in
 _____ in

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Why is photosynthesis important? _____



16. It is a sunny but windy summer day, and you're playing in your yard. The flowers are swaying back and forth near your house. Several days later, you notice new flowers growing in the back edge of your yard, where flowers have never grown before. How could this have happened? (p. 17)



Science C

Days 6–10: Date: _____ to _____

Week Overview																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

Week 2				
Date:	Day 5	Day 6	Day 7	Day 8
DK Did You Know? Science	pp. 18–21	pp. 22–25	pp. 26–29	
Activity Sheet Questions	#1–5	#6–10	#11–13	
Discover & Do: 3rd Grade Science Experiments				#2: Which Beak Works Best?
The Story of Inventions				
Do Together	Velcro Hunt			
Supplies	We Provide (3SK): 2 toothpicks, 10 marbles ¹ , 3 feet of yarn (cut into 10 3" pieces), tweezers You Provide: a spoon, 8 to 10 small cereal pieces, a drinking glass or cup, a timer, a pencil			
Shopping/Planning List	For Next Week: 4 or more objects from nature (seashell, dead bug, leaf, small animal toy, etc.), Vaseline (or Aquaphor, or cooking oil), water, a bowl for mixing			
Additional Subjects:				

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1. One marble is used in a later experiment. Save in a safe place to use later.

DK Did You Know? Science

Day **5** pp. 18–21

Today your children learned about some of nature's sticky things. Most of us are familiar with burrs, the plant seeds that can cling on to our socks and shoes after a walk outside. Do your children remember ever seeing these burrs? Were they sharp or did they have more of a fuzzy feeling? Several different plants that produce burrs as seeds and they can feel quite differently. [p. 18]

Note: Limpets cling to rocks found on ocean coastlines. Their foot muscle anchors them in rough seas, and keeps them from drying out in low tides. They eat plants (and some animals) that grow on the rocks they attach themselves to, but wait to move around the rock until it's under water. When they finish feeding, they return to the same "home" spot on the rock that perfectly fits their body. [pp. 18–19]

Note: There are no notes for Days 6 & 7.

 Parental Notes

Do Together

Day
5

Velcro Hunt

Your children learned today about a man-made material called Velcro that actually works a lot like, and was inspired by, burrs! The enlarged photo of Velcro on page 19 shows just how this useful material works. Encourage your children to brainstorm ways in which Velcro might be use-

ful. Go on a hunt around the house for Velcro on everyday items. Maybe you have some clothing with Velcro. Other uses may include cord wraps, shoes, bags/totes, for attaching things to walls, umbrella tie straps, etc. If you have a magnifying glass, take a close look at the straps, hooks, and loops. In what ways can this Velcro-type structure be useful for seed dispersion? What sorts of animals might burrs stick to the best? Why? ■

Science C: Week 2 Activity Sheet







Did You Know? Science

1. Why are things in nature sticky? (p. 18)

(to help seeds travel; to attach to rocks—or stay in one place; to catch food)





2. List four ways things in nature are able to stick. Use the example pictures to help you. (pp. 18-19)

 <u>(hooks)</u>	 <u>(sticky hairs)</u>
 <u>(suckers)</u>	 <u>(sticky fluid)</u>

3. Limpets live on rocks along the seashore so they can eat plants and animals that grow on the rocks. They make a sticky fluid and have a strong muscular foot. How do these features help them live where they do? (p. 19)

(The fluid and strong foot helps them stay attached to the rock so they don't wash away in the waves.)

4. Organize the characteristics of insects and spiders into the appropriate column. (pp. 20-21)

3 body segments called arachnids	2 body segments 6 legs	8 legs related to scorpions	most adults have wings
 Insects		 Spiders	
<u>(3 body segments; 6 legs; most adults have wings)</u>		<u>(2 body segments; 8 legs; called arachnids; related to scorpions)</u>	

Science C: Week 2 Activity Sheet



5. Draw an X to show which ways spiders use silk. (p. 21)

- to make a case for eggs
- to make clothing
- to make a web to catch and store food
- to fight off enemies



6. Which of the following statements are benefits of feathers? Circle all true statements. (p. 22)

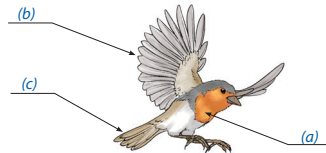
- Keeps warm
- Allows flight
- Shows off
- Scares enemies
- Rescues friends
- Finds food
- Blends and hides
- Helps swim



7. Draw a line to match each type of feather to its description. (pp. 22-23)

- a. body feathers — are slightly different shapes and lengths; make the wing a good shape for flying
- b. flight feathers — soft, fluffy; keep the bird warm
- a. tail feathers — help the bird steer and balance, and slow down to land

Use the letters for each type of feather above to label the feathers on the bird.



Science C: Week 2 Activity Sheet



8. What characteristics do mammals have in common? (p. 25)

- have fur
- are warm-blooded
- are awake at night
- have sharp teeth
- females make milk to feed babies
- have eyes on the front of their heads

9. How does a cheetah's spotted fur and sharp teeth help it to survive? (pp. 24-25)

(Their sharp teeth help it to eat the meat of their prey and their spotted fur helps them hide while hunting.)




Why are they well-suited to live on grasslands? (the sandy color and spotted pattern of their fur blends into the brown grass)


10. What is "seasonal fur" and how does it help some animals? (p. 25)


(Fur that changes color with the seasons; it allows animals to be camouflaged throughout the year.)




11. Label the parts of the food chain. Place a star next to the top of the food chain. (p. 26)

(Sun) → 

(Producer) → 

(Predator) ★ → 

(Prey) → 

Producer

Sun

Predator

Prey

Science C: Week 2 Activity Sheet



12. What body features make lions good at hunting animals like zebras, antelope and buffalo? (p. 27)



13. Describe each stage in the life cycle of a butterfly to Mom or Dad. (Lines are provided for dictation.) (pp. 28-29)

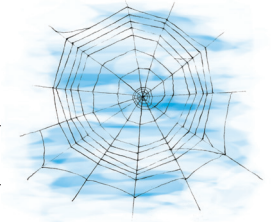
(Possible: Butterflies lay eggs that stick on leaves. Caterpillars hatch from the eggs and eat the leaf the egg was stuck to and more leaves from the same plant. Caterpillars eat to grow bigger. When the caterpillar has finished growing, it attaches itself to a branch and wraps itself in a cocoon [or chrysalis]. When the butterfly breaks free from the cocoon, its wings are soft and damp. They must stretch and dry out before the butterfly can fly away. A butterfly eats nectar and lays eggs.)

This process of transformation is called (metamorphosis). Another animal whose body changes completely through this process is a: (frog)

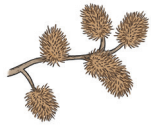


Did You Know? Science

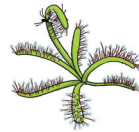
1. Why are things in nature sticky? (p. 18)



2. List four ways things in nature are able to stick. Use the example pictures to help you. (pp. 18-19)



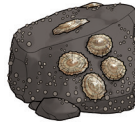
burrs



sundew plant



octopus



limpets

3. Limpets live on rocks along the seashore so they can eat plants and animals that grow on the rocks. They make a sticky fluid and have a strong muscular foot. How do these features help them live where they do? (p. 19)

4. Organize the characteristics of insects and spiders into the appropriate column. (pp. 20-21)

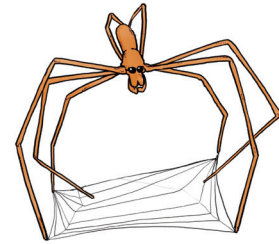
3 body segments		2 body segments		8 legs		most adults have wings	
called arachnids		6 legs		related to scorpions			
<p>Insects</p>				<p>Spiders</p>			

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5. Draw an X to show which ways spiders use silk. (p. 21)

- _____ to make a case for eggs
- _____ to make clothing
- _____ to make a web to catch and store food
- _____ to fight off enemies



6. Which of the following statements are benefits of feathers? Circle all true statements. (p. 22)

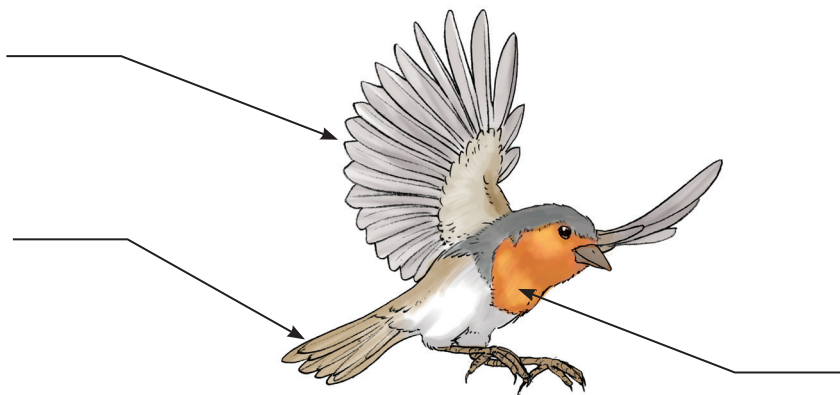
- | | | | |
|------------------------|----------------------|-------------------------|-----------------------|
| Keeps warm | Allows flight | Shows off | Scares enemies |
| Rescues friends | Finds food | Blends and hides | Helps swim |



7. Draw a line to match each type of feather to its description. (pp. 22–23)

- | | | | |
|--------------------|---|---|--|
| a. body feathers | • | • | are slightly different shapes and lengths; make the wing a good shape for flying |
| b. flight feathers | • | • | soft, fluffy; keep the bird warm |
| a. tail feathers | • | • | help the bird steer and balance, and slow down to land |

Use the letters for each type of feather above to label the feathers on the bird.





8. What characteristics do mammals have in common? (p. 25)

- | | |
|---|--|
| <input type="checkbox"/> have fur | <input type="checkbox"/> are warm-blooded |
| <input type="checkbox"/> are awake at night | <input type="checkbox"/> have sharp teeth |
| <input type="checkbox"/> females make milk to feed babies | <input type="checkbox"/> have eyes on the front of their heads |

9. How does a cheetah's spotted fur and sharp teeth help it to survive? (pp. 24–25)



Why are they well-suited to live on grasslands? _____

10. What is "seasonal fur" and how does it help some animals? (p. 25)



11. Label the parts of the food chain. Place a star next to the top of the food chain. (p. 26)

Producer

Sun

Predator

Prey

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Science C

Days 11–15: Date: _____ to _____

Week Overview																	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36

Week 3				
Date:	Day 9	Day 10	Day 11	Day 12
DK Did You Know? Science	pp. 30-33 N			
Activity Sheet Questions	#1–5			
Fossils Tell of Long Ago		entire book N		
Activity Sheet Questions		#6–9		
Wolves			pp. 4–7	
Activity Sheet Questions			#10–15	
Discover & Do: 3rd Grade Science Experiments				#3: How is a Fossil Formed?
Do Together	Flesh it Out			
Supplies	We Provide (3SK): 1 cup plaster of Paris, 4 Styrofoam cups, 1/2 cup of clay You Provide: 4 or more objects from nature (seashell, dead bug, leaf, small animal toy, etc.) ¹ , Vaseline (or Aquaphor, or cooking oil), water, a bowl for mixing			
Shopping/Planning List	For Next Week: 3-6 different scented clear liquids/oils (for example: essential oils, vinegar, perfume, lemon extract, almond extract, vanilla extract, peppermint extract, etc.), 6 zip-top plastic bags, a pencil, a marker, a timer, a blindfold or sunglasses, 3 small bowls			
Additional Subjects:				

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1. This week’s experiment requires 4 or more objects from nature (seashells, a dead bug, leaf, small toy animal, etc.). Collect these items sometime this week, so they are available for the experiment.

DK Did You Know? Science

Day
9

pp. 30-33

Note to Mom or Dad: Regarding the comment that states, “65 million years ago,” see the Introduction section for tips on addressing long periods of time. For this particular section, you might substitute “a long time ago” in place of “65 million years ago” when reading to your children. [p. 32]

Fossils Tell of Long Ago

Day
10

Entire Book

Note to Mom or Dad: Refer to our section in the Introduction regarding evolution. [p. 25]

Archaeologists are often finding new species of dinosaurs and other organisms. Just when we think the largest dinosaur or strangest sea creature has been identified, scientists unearth a massive sauropod which is a 6-foot-long ancient sea-worm! Do an internet search for “fossils” in the News section of your search engine and see what the latest findings are. Be sure to monitor your children whenever searching the internet.

Wolves

Day
11

pp. 4-7

Do you and your children think that the government intervention in the 1800s was a good idea? Should governments remove predators from land so that people can inhabit that land, or have the responsibility to increase the numbers of a certain species?

A modern-day example of government-sponsored bounty on predators comes from South Dakota. The state awards money to individuals who kill coyotes and other “nest predators.” The purpose of this bounty is to increase the population of pheasants and ducks in the area so that people have enough fowl to hunt. [p. 6]

Do Together

Day
9

Flesh it Out

A fun activity to do after reading these pages about dinosaur fossils is to “flesh out” the fossil! Archaeologists often work with artists to recreate what the animal may have looked like when it was alive. Grab a sheet of printer paper (or tracing paper) and place it over the dinosaur fossil picture in the book (you may have to turn your paper a bit to cover the fossil). Have your child use a pencil to outline where the flesh and muscle that surrounded the skeleton may have been. Then move the paper to a table and ask your child to add some details such as scaly skin, feathers, color, and texture. What kind of dinosaur do they think this may have been? ■

Science C: Week 3 Activity Sheet



Did You Know? Science

1. Write letter(s) on the line to explain why each adaptation makes a polar bear well-suited for life in the arctic. Some lines will use more than one letter. (pp. 30-31)

- ★ (c, h) hollow hairs and black skin
- (f) clear eyelid
- (b, e) huge paws
- ★ (d, g) fur
- ★ (a) fat



Draw a star next to each feature that helps a polar bear stay warm in the cold arctic.

- b) up to 4 inches of this lies under the skin to help keep the polar bear warm in cold weather
- c) act like snowshoes to keep the polar bear on top of the snow
- d) sunlight can travel through the hair
- e) a thick, short layer traps air to keep the polar bear warm
- f) slightly webbed toes help the polar bear swim
- g) helps the polar bear see underwater or during a snowstorm
- h) longer pieces stick together to be waterproof when wet
- i) this absorbs sunlight to help keep the polar bear warm

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2. **Critical Thinking:** Far inland, scientists discovered fossilized sand-ripple marks like those found on a seashore. What could they determine about what the local environment was like in that area thousands of years ago? (p. 32)

(Sand-ripple marks are caused by water—the area probably had a large body of water in it in the past)

3. How do paleontologists learn more about dinosaurs when they study coprolite? (p. 33)

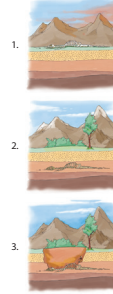
(By studying dinosaur poop, they can learn what dinosaurs ate—and what other plants or animals lived nearby.)



Science C: Week 3 Activity Sheet



4. Match the pictures to the descriptions of how fossils form. (p. 33)



The rock lifts and is worn away over time and paleontologists discover the fossils.

An animal dies and is quickly buried by sand, ash or mud.

Layers of earth, sand and mud pile up to squish the animal's body. Minerals replace the hard parts, like bones.

5. Circle the items that can be found as fossils. (pp. 32-33)

- Mammal Bones
- Animal Poop
- Rusted Cars
- Footprints
- Plants
- Shells
- Chairs
- Insects
- Skateboards
- Ripples in Sand
- Dinosaur Bones
- Horns



Fossils Tell of Long Ago

6. What could scientists learn about how ancient mammoth lived when they found a frozen mammoth in the arctic? (pp. 18-19)

(They learned that mammoths once lived in the area, that they ate grass—that grass once grew in the area, that it looked somewhat like an elephant, etc.)



Science C: Week 3 Activity Sheet



7. Circle the types of materials in which fossils are found. (pp. 8-27)

- cakes
- peat, which hardens into coal
- amber
- play-doh
- sandstone
- marble (polished limestone)
- stone
- frozen in the ground

8. Explain what we learn when we find fossils in each of the following places. (pp. 22-25)

If we find fossils of jungle plants and animals in an area that is now desert?	→	<u>(The area must have had more rainfall in the past and was once a jungle)</u>
If we find fossils of sea creatures where we now have mountains?	→	<u>(The land must have once been underwater)</u>
If we find fossils of tropical plants in cold lands?	→	<u>(Temperatures here must have once been warmer)</u>

9. What can we learn from fossils of strange creatures? (p. 25)

(We know what kinds of animals used to roam the earth that have all died out.)

Bringing Back the Wolves

10. A place where different living things interact with one another and their environment is called an: (p. 5)

- habitat
- forest
- back yard
- ecosystem

Science C: Week 3 Activity Sheet



11. How might an ecosystem change if all the rabbits went missing? (p. 5)

(Possible: grasses might grow taller; animals that eat rabbits would have less food and may start eating other animals, like squirrels, so there may be fewer squirrels, or the predators may be less healthy, etc.)



12. Challenge: What are apex predators? Why did the U.S. government offer a bounty for hunters to hunt apex predators in the late 1800s? (p. 6)

(Apex or top predators aren't eaten by any other predator. The U.S. government wanted to encourage farming in the West so they paid hunters to hunt animals that would kill cattle and livestock.)



13. How do keystone species impact other species in an ecosystem? (p. 6)

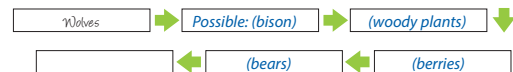
(Keystone species can affect another species directly, such as eating it, or indirectly, like a chain reaction that happens)



14. Circle the correct answer. When a keystone species goes missing in an ecosystem, the chain reaction of change that takes place is called a _____ (p. 6)

- Tragedy
- Chain Reaction
- Trophic Cascade
- Missing Link

15. Look at the chart on page 7 in your book. Trace a sequence of arrows that starts with "wolves" to show how many other species wolves affect. Record the animal names in the sequence you chose below. (You may not need all of the boxes.) (p. 7) (Answers will vary, use the forward-pointing arrows on page 7)





Did You Know? Science

1. Write letter(s) on the line to explain why each adaptation makes a polar bear well-suited for life in the arctic. Some lines will use more than one letter. (pp. 30–31)

- _____ hollow hairs and black skin
- _____ clear eyelid
- _____ huge paws
- _____ fur
- _____ fat



Draw a star next to each feature that helps a polar bear stay warm in the cold arctic.

- b) up to 4 inches of this lies under the skin to help keep the polar bear warm in cold weather
- c) act like snowshoes to keep the polar bear on top of the snow
- d) sunlight can travel through the hair
- e) a thick, short layer traps air to keep the polar bear warm
- f) slightly webbed toes help the polar bear swim
- g) helps the polar bear see underwater or during a snowstorm
- h) longer pieces stick together to be waterproof when wet
- i) this absorbs sunlight to help keep the polar bear warm

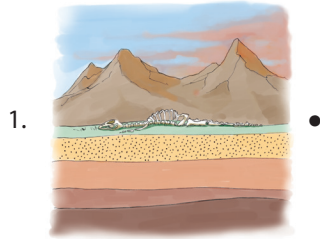
2. **Critical Thinking:** Far inland, scientists discovered fossilized sand-ripple marks like those found on a seashore. What could they determine about what the local environment was like in that area thousands of years ago? (p. 32)

3. How do paleontologists learn more about dinosaurs when they study coprolite? (p. 33)

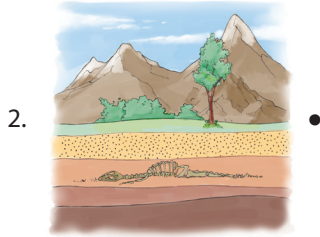




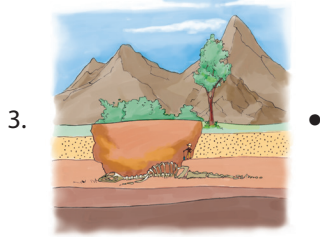
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|---------------------|------------------------|-----------------------|-------------------|
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Fossils Tell of Long Ago

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If we find fossils of sea creatures where we now have mountains?	➔	
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9. What can we learn from fossils of strange creatures? (p. 25)

Bringing Back the Wolves

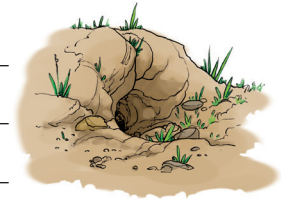
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- | | | | |
|----------------|---------------|------------------|------------------|
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|----------------|---------------|------------------|------------------|



Science C: Week 3 Activity Sheet

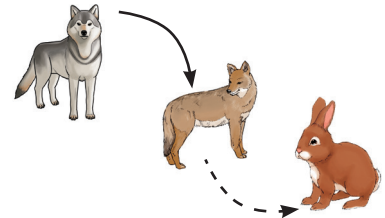
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14. Circle the correct answer. When a keystone species goes missing in an ecosystem, the chain reaction of change that takes place is called a _____ . (p. 6)

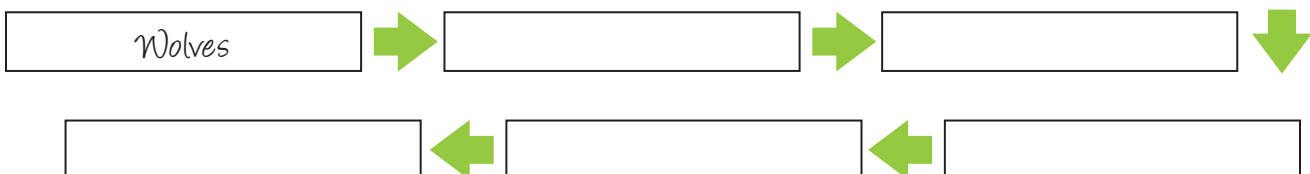
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Chain Reaction

Trophic Cascade

Missing Link

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Appendix 1: Science C—Weekly Subject List

Week	Subject
1	what living things need to survive/bacteria/plant growth
2	sticky plants/spiders/feathers/fur/predators/butterflies
3	polar bears/fossils/wolves
4	wolves/food chain/Yellowstone
5	wolves/food chain/Yellowstone
6	wolves/seas and oceans/underwater life/food webs/camouflage
7	coral reefs/symbiosis/poisonous animals/sharks/rays
8	whales/dolphins/deep sea life/migration/Arctic and Southern oceans/walrus/penguins
9	waves/currents/tides/coasts/seashore life
10	hurricanes/tsunamis/boats and ships/submarines/shipwrecks/ocean resources
11	ocean pollution/over fishing/undersea facts
12	human body tissues/organs/skin/genes/DNA
13	natural selection/Mendel/mitosis/meiosis/chromosomes/dominant and recessive genes/genome/inherited diseases
14	RNA/enzymes/amino acids/nature vs. nurture/DNA in criminology/family tree/fingerprints/bones
15	muscles/respiratory system/circulatory system
16	digestive system/central nervous system/healing
17	healing/atoms/molecules/state
18	distillation/mixtures/metals/plastics from oil
19	chemical reactions/acid/base/pH scale/types of energy
20	light/colors/sound waves/conduction/convection/radiation
21	electricity/electrons/lightning/current/power/conductors/insulators/power plants/generators/light bulbs
22	electromagnetism/alternating current/light switches/appliances/circuit diagram/static/charges
23	electromagnetism/what makes magnets/coal/oil/natural gas
24	Nikola Tesla/alternating current generator/Thomas Edison/force/Newton's laws of motion
25	friction/magnetic poles/simple machines
26	car engines/gravity/how planes fly
27	Earth's layers/tectonic plates/water cycle
28	oceans/clouds/weather/atmosphere
29	physics/movement/forces/friction/gravity
30	snow/hail/dew/erosion/lightning/tornado
31	hurricane/light in the atmosphere/sea weather/desert weather
32	weather forecasting/changing climates/harnessing the weather
33	weather/atmosphere/phases of the moon
34	planetary life support/space/galaxies/dark matter/stars/rockets/space suits
35	robots/history of robots/purpose/how they move/inspiration from nature/performing human jobs
36	robot size/androids/robots in space/robot competitions

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	Intro to American History, 1 of 2														
	Language Arts D														
	Biology, Taxonomy, & Human Anatomy														
LEVEL D	Intro to American History, 2 of 2														
	Language Arts E														
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LEVEL D+E	Eastern Hemisphere														
	Language Arts F														
	Health, Medicine, & Human Anatomy														
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	Language Arts G														
	Geology, Physics, & Origins														
LEVEL G	World History, 2 of 2														
	Language Arts H														
	General Science*														
	Conservation, Robotics, & Tech*														
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	Language Arts W														
	History of Science														
LEVEL W	Language Arts J														
	Physics, Electromagnetism, & Waves														
LEVEL J															



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