SCIENCE

3rd Grade

Sample Lesson

CHRISTIAN SCHOOLS INTERNATIONAL

Science 3

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CHRISTIAN SCHOOLS
INTERNATIONAL

CSI Science Perspective Statement

The CSI science program centers on the acknowledgment that the world in which we live belongs to God, who created and upholds it. Through scientific inquiry we can perceive a degree of the amazing complexity and orderliness of God's world. With this fuller understanding of creation comes a deepened awareness of the goodness and power of its Creator.

When we study creation, we learn not only about God but also about ourselves. We are a part of God's creation—a very special part. God designed a perfect harmony of relationships among humans, animals, plants, and nonliving things, but our fall into sin disrupted this unity and balance. As God's redeemed people through Christ's renewing power, we have been entrusted with bringing restoration and reconciliation to God's good creation.

God has put his world under our control and made us its caretakers. Caring for God's creation is a task with great responsibility that cannot be taken up lightly or in ignorance. Science is an essential tool for us to use in learning about the natural laws God has established so that we can care for the world wisely.

We live in an age in which scientific knowledge has increased at an explosive rate, and the use of that knowledge changes our lives daily. Some people believe that we can gain complete knowledge of—and mastery over—the world through science. Medical researchers have nearly eradicated some diseases, specialists have developed laser instruments that have revolutionized surgery, astronomers using sophisticated space probes have solved many mysteries of the universe, computer scientists have created machines that seemingly border on human intelligence. The possibilities of science seem endless.

Because science is a human activity, however, the knowledge that it can help us gain is limited. Secular culture tends to reduce the world to the human realm and therefore widely considers scientific inquiry or human reason as the path to all knowledge. But for Christians, ultimate truth is found only in God. Science is one avenue—an important one to be sure, but still only one—toward gaining an understanding of God's creation.

Science and the Bible

The relationship between science and the Bible has long been an emotionally charged issue. Sometimes non-Christians treat scientific theories as fact and use them to exclude God from scientific inquiry. This practice has led many Christians to believe that science and Christianity are antithetical.

In science textbooks, encyclopedias, library books, and magazines, students often encounter beliefs that do not acknowledge God, such as theories that explain the origin of the universe as a chance occurrence. It is important for students in a Christian school to realize that these kinds of beliefs spring from a worldview that does not include God. That such beliefs exist, however, does not make science itself incompatible with Christianity.

For us as Christians, all science should be conducted within a larger framework, or worldview, based on faith. The Bible is the divinely inspired record of God's redemptive work on behalf of his people; it contains all that is necessary for bringing us to salvation and instructing us about how to live. As the infallible Word of God, it is the only book that has the status of divine authority.

We learn about God through the direct revelation of his Word. We can also learn about God through the general revelation of his creation. As defined by theologian Louis Berkhof, general revelation is the way that "God speaks to man in his entire creation in the forces and powers of nature, in the voice of conscience, and in the providential government of the world in general and of the lives of individuals in particular." As Berkhof also notes, however, general revelation has limitations as a result of the Fall.

The study of science is one method of learning about God as he reveals himself in creation. Science is important for studying direct causes and finite relations in the material world. It can explain how events occur, but it cannot explain why. For this reason, it is vital that scientific study be conducted in the light of biblical revelation; the Bible sets the facts obtained through scientific study in the correct context of ultimate causes and infinite relations. The Bible and science are complementary, together helping us understand God's plan and purpose for creation.

The CSI science program is designed to be used in a school that includes both devotions and Bible study on a daily basis. Throughout the series, students are encouraged to examine a biblical perspective and to discuss Christian responses to issues in science.

Stewardship

One such issue is our responsibility as stewards of creation. In recent years an increasing number of people have begun to recognize the wisdom of caring for the Earth. Conserving the Earth's resources protects our own health, maintains the natural beauty of our environment, and preserves the Earth for future generations. In addition to these worthy goals, Christians have a more fundamental motivation for protecting the environment, a motivation that lies in our very reason for being.

As human beings created in the image of God, we have a unique position in creation. We are part of nature, yet because of our special relationship with God, we are also above it, sharing in God's dominion over all living things. When God placed Adam and Eve in the Garden of Eden, he commanded them to work the land and take care of it. The use and care of the Earth has been entrusted to us. It is our privilege and responsibility as God's stewards to serve and protect the rest of creation and, in so doing, to glorify the Creator.

We have failed in carrying out the cultural mandate fully because of the fall into sin, but Christ's redeeming grace enables us to continue doing God's work in the world. As Christ's representatives, we must work toward bringing God's peace to all life on the Earth.

Stewardship of the Earth is not a grim, joyless assignment forced upon reluctant Christians. It is rather a task motivated, at least in part, by an awe and appreciation of the extraordinary wonders of the world God created. The fall has affected the world, but it has not completely obscured the matchless handiwork of the Creator. We see evidences of God's

creative genius in massive geological formations, in the intricate relationships of parts within an atom, in old-growth forests, and in the variety and complexity of the creatures that inhabit the land, air, and ocean. We also observe God's providential care for his creation in the cycle of the seasons, in human and animal reproduction, in the provision of foods for nutrition, and in our own with the ability to make positive changes in our environment.

The CSI science series matches a sense of awe at the unity and diversity of creation with an awareness of the delicate balance of interrelationships among its parts and of our responsibility for its welfare. Students are led to examine their own lifestyles and become conscious of the impact that their daily actions have on the myriad forms of life in God's creation. They are encouraged to use their unique abilities as a means to honor and obey God, to serve other humans, and to sustain God's remarkable gift of the Earth and its resources.

Science and Technology

Another issue in science that demands a Christian response is the application of science in technology. The vast influence and rapid growth of technology has largely shaped our society, institutions, and way of life. Thus, it is essential that today's students have the knowledge and skills to enable them to participate as informed and trustworthy stewards of an increasingly technologized world.

A science curriculum should help students understand how science, technology, and society influence one another. Science is concerned with understanding the way the world works, while technology uses science to change the way the world works, usually in order to meet a societal need or desire. Unfortunately, many technological devices that meet human needs are destructive in other ways. As a result, we now find ourselves in a world of dwindling resources and environmental hazards.

But the very technology that can be so destructive may also provide the means to end such damage. The challenge lies with tomorrow's adults to develop the kind of technology that will preserve the Earth rather than threaten it.

CSI's science program seeks to foster a questioning attitude in students by presenting both the successes and failures of human beings in using technology. In this way, students are led to both appreciate the value of science and technology in society and to understand their limitations.

Concepts and Content

The world is a place of constant surprise and wonder. Learning about God's world prompts amazement and awe of the One who created and upholds the world.

The CSI science series uses student's natural inquisitiveness and joy of discovery as the basis for further investigation into the beauty, order, intricacy, and variety of God's world. Written from the perspective of "let's find out" about God's world, this curriculum gives structure to their exploration, building on their natural curiosity and eagerness to investigate by initiating activities and discussions that relate directly to their world. The lessons are student-centered and active, encouraging students to make their own hypotheses and devise ways to test them. Science becomes a cooperative activity, with the teacher often guiding—rather than dictating—the exploration of the students.

Rather than the teacher explaining a concept and then illustrating it with activities, the concepts develop from the students' own concrete experiences. This inductive approach to learning not only makes science more interesting for the students, but also makes it relevant to their lives. With the teacher's guidance, students become creative problem solvers who are able to imagine possibilities and implications, to use a variety of resources and observation skills, to gather information, to form and articulate ideas, and to make responsible decisions.

The Christian Classroom

At the heart of any study taking place in the Christian school classroom is the Bible. CSI's science program is steeped in a profound biblical perspective that leads students to see God's hand in everything around them. The program materials are filled with interest-provoking pictures, projects, and hands-on activities that serve as a basis for scientific concepts and relate them to everyday life. These concrete, creative learning experiences based on God's Word will enrich students' knowledge of creation, affirm their faith in the Creator, and enable them to use science to the glory of God.

Using the CSI Science Curriculum

CSI's science curriculum, 2nd edition, is a hands-on program that encourages students to become actively involved in scientific discovery. The curriculum is designed to give teachers as much flexibility as possible. Most units are independent, so they can be used in whatever order is most convenient for teachers, students, and cross-curricular activities planning. Teachers can choose lessons based on the interests of students, the time and materials available, each school's overall science program.

Most lessons can be taught in a single class period, but many contain enough optional and cross-curricular activities to provide a week's worth of lesson material.

This curriculum provides a comprehensive framework for teaching science. It is not meant, however, to prescribe every step of each lesson. Teachers are encouraged to use the built-in flexibility to shape the curriculum to best fit your school's overall goals and objectives, your individual teaching style, and your students' needs and abilities.

Teacher Guide

Unit Openers

- The *Unit Overview* allows you to see at a glance all the lessons contained in each unit.
- The *Unit Background* provides Christian perspective or brief scientific background for each unit.
- *Unit Resources* provide you with science resource books and audiovisual materials both for you and for the students.
- *Bulletin Board Ideas* and *Center Ideas* suggest ways to reinforce the unit's topic.

Lessons

- *Student Objectives* for each lesson tell you that lesson's aims for student learning. These objectives are specific, measurable goals that will enable you to check the progress of your students.
- *Structuring the Curriculum* helps are placed in some lessons to help you with lesson planning.
- The lesson *Background* provides information to help the nonspecialist teacher understand the science concepts of the lesson. While the *Background* may be helpful in answering student questions, it is intended primarily as a teacher resource.
- Each lesson opens with lesson-related *Discover* activities or questions to spark the interest of students, assess their previous knowledge of lesson content, and encourage them to discover for themselves the concepts of the lesson.

- The *Develop* section helps students understand the concepts that they explored in *Discover.* This section may also include additional activities to reinforce or expand the students' learning.
- *Reinforce/Assess* enables you to test students' learning and strengthen their understanding of lesson concepts. A simple reinforcement activity may also be included in this section.
- Many *Extend* activities are provided at the end of each lesson. These activities include additional science experiments and demonstrations, as well as literature, cross-curricular activities, and Bible studies that relate to the lesson concepts. All of the *Extend* activities are optional, but if you have time to do them, they will provide valuable support for student learning.

Activity Sheets

- The back of the teacher guide contains blackline masters for you to copy. Suggestions for their use are incorporated in the lesson during *Discover, Develop,* or *Reinforce/Assess.*

New DVD/PDF Option with Supplemental Material

The new Grade K–2 Science DVD/PDF includes:

- Exciting new flexible lessons and units that complement the printed curriculum
- New experiments and activities to reinforce and enhance the new material
- New Glossary terms and updated references
- Integration of up-to-date technology
- New multiple forms of assessments

DVD/PDF is available upon request. To inquire or order, visit the store at www.csionline.com.

National Science Education Standards

In order to provide teachers and students with the most comprehensive science education curriculum, CSI's 2nd edition materials were updated and expanded in accordance with the National Science Education Standards. Adherence to these standards is charted on pages 17b-17c.

K–6 Scope and Sequence

Kindergarten

Unit 1: Investigating Health
- Lesson 1: Who Created Me?
- Lesson 2: What Are Families Like?
- Lesson 3: How Does Learning Help Us?
- Lesson 4: What Does Skin Do?
- Lesson 5: How Does Eating Help Our Bodies?
- Lesson 6: How Should We Care for Our Teeth?
- Lesson 7: How Do Rest and Exercise Help Our Bodies?
- Lesson 8: How Can We Avoid Getting Sick?
- Lesson 9: How Can We Treat Illnesses?

Unit 2: Investigating Living Things
- Lesson 1: Scientific Investigations
- Lesson 2: How Are Plants Alike and Different?
- Lesson 3: How Do Plants Grow?
- Lesson 4: How Are Plants Useful in God's Creation?
- Lesson 5: How Are Animals Alike and Different?
- Lesson 6: How Do Animals Change As They Grow?
- Lesson 7: How Are Animals Useful in God's Creation?

Unit 3: Investigating Materials
- Lesson 1: What Are Wood, Metal, Rubber, and Leather Like?
- Lesson 2: What Is Clay Like?
- Lesson 3: What Are Fabrics and Paper Like?
- Lesson 4: What Are Glass and Plastic Like?
- Lesson 5: What Are Composite Pieces Like?

Unit 4: Investigating God's Nonliving World
- Lesson 1: What Are Nonliving Things Like?
- Lesson 2: What Are Rocks and Soil Like?
- Lesson 3: What Is Water Like?
- Lesson 4: How Are Landforms and Bodies of Water Different?
- Lesson 5: How Can We Take Care of the Land and the Water?
- Lesson 6: What Are Sky Objects Like?
- Lesson 7: What Does the Sun Do?
- Lesson 8: What Objects Can We See in the Nighttime Sky?

Unit 5: Investigating Transportation
- Lesson 1: What Safety Rules Are Important for Pedestrians?
- Lesson 2: How Does Technology Help with Transportation?
- Lesson 3: How Do We Get around the Neighborhood?
- Lesson 4: How Do We Stay Safe in Cars and Buses?
- Lesson 5: What Are Trucks and Trains Like?
- Lesson 6: What Is Sea Transportation Like?
- Lesson 7: What Is Air Transportation Like?

Grade 1

Unit 1: Scientific Investigations

- Lesson 1: How Do We Do Science?
- Lesson 2: What Is Teamwork?
- Lesson 3: How Do We Measure Length?
- Lesson 4: How Do We Use a Ruler?
- Lesson 5: How Do We Measure Temperature?
- Lesson 6: How Do We Measure How Much a Container Holds?

Unit 2: Investigating the Senses

- Lesson 1: What Are Your Senses?
- Lesson 2: How Do You See?
- Lesson 3: What Happens When People Can't See?
- Lesson 4: How Do You Hear?
- Lesson 5: What Happens When People Can't Hear?
- Lesson 6: How Do You Smell?
- Lesson 7: How Do You Taste?
- Lesson 8: How Do You Feel?
- Lesson 9: How Do You Use All of Your Senses?

Unit 3: Investigating Living Things

- Lesson 1: How Are Living Things Different from Nonliving Things?
- Lesson 2: How Do Living Things Reproduce Themselves?
- Lesson 3: How Do Living Things Grow and Change?
- Lesson 4: How Do Living Things Move?
- Lesson 5: How Do Living Things Respond to Other Things, and How Do Living Things Show Variety?
- Lesson 6: How Does God Provide for Plants?
- Lesson 7: How Does God Provide for Animals?

Unit 4: Investigating Changes

- Lesson 1: How Do People Change?
- Lesson 2: How Do Families Change?
- Lesson 3: What Changes Do Living Things Make When They Do Their Activities?
- Lesson 4: How Does the Earth Change?
- Lesson 5: How Does the Sun Make Changes?
- Lesson 6: How Do the Stars Seem to Change?
- Lesson 7: How Does the Moon Change?
- Lesson 8: How Do Weather Patterns Change?
- Lesson 9: How Does the Wind Change?
- Lesson 10: How Do Temperature and Precipitation Change?
- Lesson 11: What Changes Happen in the Fall?
- Lesson 12: What Changes Happen in the Winter?
- Lesson 13: What Changes Happen in the Spring?
- Lesson 14: What Changes Happen in the Summer?

Unit 5: Investigating Materials and Objects

- Lesson 1: What Are Materials and Objects Like?
- Lesson 2: How Can We Use Numbers in Observations?
- Lesson 3: What Are the Properties of Different Materials?
- Lesson 4: How Can a Material's Uses and Properties Be Changed through Mixing with Water?
- Lesson 5: How Can a Material's Uses and Properties Be Changed through Manipulating Them?
- Lesson 6: How Can a Material's Uses and Properties Be Changed through Heating or Cooling?

Unit 6: Investigating Things That Make Sound

- Lesson 1: How Is Technology Useful?
- Lesson 2: How Do Different Sound Systems Make Sounds?
- Lesson 3: How Can I Make a Sound System?
- Lesson 4: How Do Sounds Change?
- Lesson 5: How Can Tools Help Make a Sound System?
- Lesson 6: How Can I Design a Sound System?
- Lesson 7: How Can I Build a Sound System?
- Lesson 8: How Can I Use My Sound System?

Grade 2

Unit 1: Scientific Investigations

- Lesson 1: How Do Scientists Do Science?
- Lesson 2: What Is Teamwork?
- Lesson 3: How Are Investigations, Observations, and Explanations Done?
- Lesson 4: How Do We Measure Amounts?
- Lesson 5: How Do We Measure Weight?

Unit 2: Investigating Bones and Muscles

- Lesson 1: What Are Bones Like?
- Lesson 2: What Bones Are in Your Body?
- Lesson 3: How Should We Care for Our Bones?
- Lesson 4: What Are Joints Like?
- Lesson 5: What Do Skeletal Muscles Do?
- Lesson 6: What Do Involuntary Muscles Do?
- Lesson 7: How Should We Care for Our Muscles?

Unit 3: Investigating Health and Safety

- Lesson 1: What Fuel Does My Body Need?
- Lesson 2: Why Are Food Groups Important?
- Lesson 3: How Can We Eat a Balanced Diet?
- Lesson 4: What Good Is Exercise?
- Lesson 5: Why Keep Clean?
- Lesson 6: Why Do We Rest?
- Lesson 7: How Can We Stay Safe?

Unit 4: Investigating Animals

- Lesson 1: What Can We Learn about Animals?
- Lesson 2: What Are Animal Life Cycles Like?
- Lesson 3: Where Do Animals Live?
- Lesson 4: How Do Animals Change Their Habitats?
- Lesson 5: How Does God Prepare Animals for Their Homes?
- Lesson 6: What Do Animals Eat?
- Lesson 7: How Do Animals Behave?
- Lesson 8: Can Behavior Be Learned?
- Lesson 9: How Do Animals Stay Safe?
- Lesson 10: What Is a Fossil?
- Lesson 11: What Animals Lived Long Ago?
- Lesson 12: Why Are Some Animals Extinct?
- Lesson 13: How Can People Protect Animals?

Unit 5: Investigating Liquids and Solids

- Lesson 1: What Are Solids and Liquids Like?
- Lesson 2: What Do Solids Look and Feel Like?
- Lesson 3: How Can Solids Be Measured?
- Lesson 4: What Do Liquids Look and Feel Like?
- Lesson 5: How Does Surface Tension Affect Liquids?
- Lesson 6: What Is Evaporation?
- Lesson 7: What Are Gases Like?
- Lesson 8: What Happens When Solids and Liquids Are Mixed?
- Lesson 9: What Happens When We Mix Liquids with Other Liquids?
- Lesson 10: How Can We Use and Care for Liquids and Solids?

Unit 6: Investigating Position and Motion

- Lesson 1: What Is Position?
- Lesson 2: How Do Reference Objects and Distance Describe Position?
- Lesson 3: What Is Motion?
- Lesson 4: How Do Paths Relate to Motion?
- Lesson 5: How Do Different Things Move?
- Lesson 6: How Can Motion Change?
- Lesson 7: How Can We Predict Motion?

Unit 7: Investigating Buoyancy and Boats

- Lesson 1: What Is Technology?
- Lesson 2: What Makes Things Float and Sink?
- Lesson 3: How Do Floating Things Move?
- Lesson 4: What Are Sailboats Like?
- Lesson 5: How Are Other Boats Propelled?
- Lesson 6: How Are Tools Used?
- Lesson 7: How Are Boats Designed?
- Lesson 8: How Are Boats Built?
- Lesson 9: How Does My Boat Work?

Grade 3

Unit 1: Scientific Investigations

- Lesson 1: How Do Scientists Do Science?
- Lesson 2: What Is Teamwork?
- Lesson 3: How Do We Measure Temperature?
- Lesson 4: How Are Tables and Graphs Used?

Unit 2: Investigating the Circulatory and Respiratory Systems

- Lesson 1: What Does the Circulatory System Do?
- Lesson 2: How Can I Care for My Circulatory System?
- Lesson 3: What Does the Respiratory System Do?
- Lesson 4: How Can I Care for My Respiratory System?
- Lesson 5: How Can I Avoid Accidents?

Unit 3: Investigating Plants

- Lesson 1: What Is the Life Cycle of Plants?
- Lesson 2: Where Do Plants Live?
- Lesson 3: How Are Plants Structured?
- Lesson 4: What Do Plants Need?
- Lesson 5: How Do Plants Interact with Their Surroundings?
- Lesson 6: How Do Fossils Help Us Learn More about Plants?
- Lesson 7: How Are Plants Grouped?

Unit 4: Investigating Forces and Electricity

- Lesson 1: What Is a Force?
- Lesson 2: What Is a Magnet?
- Lesson 3: What Is an Electric Charge?

Unit 5: Investigating Heat and Temperature

- Lesson 1: What Is Temperature?
- Lesson 2: What Is Heat?
- Lesson 3: How Is Heat Produced?
- Lesson 4: What Is Conduction?
- Lesson 5: What Is Convection?
- Lesson 6: What Is Radiation?

Unit 6: Investigating Soil

- Lesson 1: How Does Soil Form?
- Lesson 2: What Are Different Types of Soil Like?
- Lesson 3: What Are Soil Layers Like?
- Lesson 4: How Do We Depend on Soil?
- Lesson 5: How Can We Care for Soil?

Unit 7: Investigating Natural Resources

- Lesson 1: How Do We Use Water, and Where Do We Find Water?
- Lesson 2: What Are the Different Kinds of Water?
- Lesson 3: What Are the Different Forms of Water?
- Lesson 4: What Is the Water Cycle?
- Lesson 5: Where Does Water Come From?
- Lesson 6: How Can We Clean Up Water Pollution?
- Lesson 7: How Can We Take Care of Water?
- Lesson 8: What Is Air Like?
- Lesson 9: How Can We Use and Take Care of Air?
- Lesson 10: What Is Air Pollution?
- Lesson 11: What Is a Natural Resource?
- Lesson 12: How Are Natural Resources Processed?
- Lesson 13: How Can Natural Resources Be Replaced?
- Lesson 14: How Can We Conserve Natural Resources?

Unit 8: Investigating Structures

- Lesson 1: What Is Scale?
- Lesson 2: What Materials Are Strong and Stable?
- Lesson 3: What Goes into Structures?
- Lesson 4: How Can I Plan a Structure?
- Lesson 5: How Can I Build a Structure?
- Lesson 6: How Can I Evaluate a Structure?

Grade 4

Unit 1: Scientific Investigations

- Lesson 1: What Is Teamwork?
- Lesson 2: How Can Scientific Investigations Answer Questions?
- Lesson 3: How Are Scientific Tools Helpful?
- Lesson 4: How Do I Deal with Data?
- Lesson 5: How Do I Use Results?

Unit 2: Investigating Organ Systems

- Lesson 1: What Do Organ Systems Do?
- Lesson 2: How Does the Digestive System Work?
- Lesson 3: How Can I Care for My Digestive System?
- Lesson 4: How Does the Urinary System Work?
- Lesson 5: How Can I Care for My Urinary System?
- Lesson 6: How Can I Prevent Injury to My Organs?
- Lesson 7: How Does Organ Donation Work?

Unit 3: Investigating Living Things and Their Homes

- Lesson 1: What Are Living Things Like?
- Lesson 2: What Is the Importance of Habitats and Niches?
- Lesson 3: What Is Ecology?
- Lesson 4: What Is a Pond Community Like?
- Lesson 5: How Are Living and Nonliving Things Important in an Ecosystem?
- Lesson 6: How Do the Parts of an Ecosystem Interact?
- Lesson 7: How Does Energy Flow in an Ecosystem?

Unit 4: Investigating Light

- Lesson 1: What Is Light?
- Lesson 2: How Does Light Travel?
- Lesson 3: How Do Shadows Form?
- Lesson 4: How Does Light Reflect?
- Lesson 5: How Does Light Bend?
- Lesson 6: How Do We See?
- Lesson 7: What Is Color?
- Lesson 8: How Is Light Used in Technology?

Unit 5: Investigating Sound Waves and Hearing

- Lesson 1: How Does Sound Carry Energy?
- Lesson 2: What Causes High and Low Sounds?
- Lesson 3: What Causes Loud and Soft Sounds?
- Lesson 4: How Does Sound Interact with Different Materials?
- Lesson 5: How Do We Hear?
- Lesson 6: What Is Noise?
- Lesson 7: How Is Sound Used in Technology?

Unit 6: Investigating Minerals, Rocks, and Earth's Structure

- Lesson 1: What Is a Mineral?
- Lesson 2: What Are Rocks Like?
- Lesson 3: How Do Rocks Change Form?
- Lesson 4: How Do Fossils Form?
- Lesson 5: How Do We Use Rocks and Minerals?
- Lesson 6: What Is Earth's Structure Like?
- Lesson 7: How Do Weathering and Erosion Change Earth's Surface?

Unit 7: Investigating Packaging

- Lesson 1: How Are Packages Designed?
- Lesson 2: How Are Packages Designed to Protect?
- Lesson 3: How Are Packages Designed to Group?
- Lesson 4: How Are Packages Designed to Beautify and Advertise?
- Lesson 5: How Are Packages Designed to Inform?
- Lesson 6: How Are Packages Made?
- Lesson 7: How Do Packages Affect Creation?
- Lesson 8: How Can I Make the Best Package and Evaluate Packages?

Grade 5

Unit 1: Scientific Investigations
- Lesson 1: What Is Teamwork?
- Lesson 2: How Can Scientific Investigations Answer Questions?
- Lesson 3: How Are Microscopes Used?
- Lesson 4: How Are Measurements and Data Determined and Used?
- Lesson 5: How Do Scientists Develop Explanations?

Unit 2: Investigating the Endocrine and Reproductive Systems
- Lesson 1: How Does Growth Happen?
- Lesson 2: How Does the Endocrine System Work?
- Lesson 3: What Happens during Puberty?
- Lesson 4: What Is Reproduction Like?
- Lesson 5: How Does the Female Reproductive System Work?
- Lesson 6: How Does the Male Reproductive System Work?
- Lesson 7: How Do Unborn Babies Develop?
- Lesson 8: What Are Sexually Transmitted Diseases?
- Lesson 9: How Can I Protect Myself from Sexual Abuse?

Unit 3: Investigating Nutrition
- Lesson 1: What's in the Food I Eat?
- Lesson 2: Why Do I Need Protein?
- Lesson 3: Why Do I Need Carbohydrates and Fats?
- Lesson 4: Why Do I Need Vitamins?
- Lesson 5: Why Do I Need Minerals?
- Lesson 6: Why Do I Need Water?
- Lesson 7: How Can I Get the Nutrients I Need?
- Lesson 8: Why Do I Eat What I Do?
- Lesson 9: Can I Trust Food Advertisements?

Unit 4: Investigating Cells
- Lesson 1: Why Are Cells Important?
- Lesson 2: How Do Cells Work?
- Lesson 3: How Are Traits Passed Along?

Unit 5: Investigating Agriculture and Forestry
- Lesson 1: Why Do We Need Plants?
- Lesson 2: What Does Agriculture Involve?
- Lesson 3: How Is Food Transported and Processed?
- Lesson 4: What Are Forests Like?
- Lesson 5: How Can We Best Use Plants, the Land, and the Food Supply?

Unit 6: Investigating Motion and Forces
- Lesson 1: What Is Motion?
- Lesson 2: What Are the Laws of Motion?
- Lesson 3: What Is Force?
- Lesson 4: How Do Machines Make Work Easier?
- Lesson 5: What Are the Simple Machines?
- Lesson 6: How Do Machines Affect Society?

Unit 7: Investigating Space
- Lesson 1: What Is the Solar System Like?
- Lesson 2: What Is the Earth Like?
- Lesson 3: What Is the Moon Like?
- Lesson 4: What Is the Sun Like?
- Lesson 5: What Are the Stars Like?
- Lesson 6: What Is the Universe Like?
- Lesson 7: How Does Technology Help Us Study Space?
- Lesson 8: What Role Did the Heavens Have in Various Civilizations?

Unit 8: Investigating Things that Move
- Lesson 1: What Makes Vehicles Work?
- Lesson 2: Why Are Gears Important to Vehicles?
- Lesson 3: How Does Rolling Relate to Movement?
- Lesson 4: What Energy Sources Are Important for Vehicles?
- Lesson 5: How Can I Plan a Vehicle that Moves?
- Lesson 6: How Can I Build a Vehicle that Moves?
- Lesson 7: How Can I Evaluate a Vehicle that Moves?

Grade 6

Unit 1: Scientific Investigations

- Lesson 1: What Is Teamwork?
- Lesson 2: How Can Scientific Investigations Answer Questions?
- Lesson 3: What Science Skills and Tools Are Important?
- Lesson 4: How Do Computers Help Us Analyze Data?
- Lesson 5: How Do Scientists Develop Explanations?

Unit 2: Investigating the Immune and Nervous Systems

- Lesson 1: How Does the Immune System Work?
- Lesson 2: What Is a Communicable Disease?
- Lesson 3: What Is a Noncommunicable Disease?
- Lesson 4: How Do Medicines Help the Immune System?
- Lesson 5: How Can I Care for My Immune System?
- Lesson 6: How Does the Nervous System Work?
- Lesson 7: What Things Put the Nervous System at Risk?
- Lesson 8: What Things Attack Your Nervous System?
- Lesson 9: How Can I Care for My Nervous System?

Unit 3: Investigating the Diversity of Life

- Lesson 1: What Are the Similarities and Differences among Living Things?
- Lesson 2: How Are Living Things Classified?
- Lesson 3: What Are Fish, Amphibians, and Reptiles Like?
- Lesson 4: What Are Birds and Mammals Like?
- Lesson 5: What Are Invertebrates Like?
- Lesson 6: What Are Plants Like?
- Lesson 7: How Do Plants Make Food?
- Lesson 8: What Are Bacteria, Fungi, and Protists Like?
- Lesson 9: How Are Living Things Connected?

Unit 4: Investigating Energy

- Lesson 1: What Are the Different Forms of Energy?
- Lesson 2: How Does Energy Change Form?
- Lesson 3: What Are Our Sources of Energy?
- Lesson 4: How Can We Use Energy Wisely?

Unit 5: Investigating Electricity

- Lesson 1: What Is Electrical Energy?
- Lesson 2: How Can We Be Safe around Electricity?
- Lesson 3: How Does Electric Current Flow through Circuits?
- Lesson 4: How Are Electricity and Magnetism Related?
- Lesson 5: How Do We Generate Electrical Energy?
- Lesson 6: How Can We Conserve Electrical Energy?
- Lesson 7: What Is Electronics?

Unit 6: Investigating Matter

- Lesson 1: What Is Matter?
- Lesson 2: What Are Elements Like?
- Lesson 3: What Are Compounds?
- Lesson 4: How Do the States of Matter Compare?
- Lesson 5: How Do Properties of Different Substances Compare?
- Lesson 6: How Does Matter Change?

Unit 7: Investigating Weather

- Lesson 1: How Does the Atmosphere Relate to Weather?
- Lesson 2: How Does Moisture Behave in the Atmosphere?
- Lesson 3: What Is the Nature of Weather?
- Lesson 4: What Is Climate?
- Lesson 5: What Factors Make up Weather?
- Lesson 6: How Are Weather Factors Measured?
- Lesson 7: How Do Weather Patterns Help Us Predict Weather?
- Lesson 8: How Do Weather Systems Form?

Unit 8: Investigating Flight

- Lesson 1: How Do We Do Technology?
- Lesson 2: What Are the Features of Living Things That Fly?
- Lesson 3: How Were Flying Machines Developed?
- Lesson 4: How Does Air Support Flight?
- Lesson 5: How Do Gravity and Lift Relate to Flight?
- Lesson 6: How Do Thrust and Drag Relate to Flight?
- Lesson 7: How Can We Control Flight?
- Lesson 8: How Are Airplanes Designed?
- Lesson 9: How Well Does My Flying Device Perform? (teacher guide only)
- Lesson 10: How Can We Be Good Stewards with Our Airplanes? (teacher guide only)

Unit 3
Investigating Plants

Unit Overview

Lesson 1: What Is the Life Cycle of Plants?
Lesson 2: Where Do Plants Live?
Lesson 3: How Are Plants Structured?
Lesson 4: What Do Plants Need?
Lesson 5: How Do Plants Interact with Their Surroundings?
Lesson 6: How Do Fossils Help Us Learn More about Plants?
Lesson 7: How Are Plants Grouped?

Unit Background

Plants are an integral part of God's creation. Plants are important to people and animals because they provide food, water, oxygen, and beauty. They also maintain the balance of carbon dioxide in the air. Their roots hold soil in place, preventing erosion.

In plants we see evidence of God's care for his creation. God gives plants an intricate structure that enables them to make their own food through photosynthesis. He also provides them with a way to reproduce. Seeds travel from their parent plants in various ways.

Through plants we learn that God loves and provides for all of creation. Matthew 6:28–30 says, "And why do you worry about clothes? See how the lilies of the field grow. They do not labor or spin. Yet I tell you that not even Solomon in all his splendor was dressed like one of these. If that is how God clothes the grass of the field, which is here today and tomorrow is thrown into the fire, will he not much more clothe you, O you of little faith?"

Wisconsin Fast Plants are fast growing members of the mustard family. These plants complete an entire life cycle from germination and growth to pollination and seed dispersal in just 35 days. They sprout and flower in a matter of days making them ideal for classroom experiments. Complete Fast Plant growth kits are sold by science education supply companies.

Lesson 2
Where Do Plants Live?

Objectives

Students will

- identify the major biomes
- describe the plant life living in each biome
- understand the relationships between the climate, plant species, and animal species of a biome

Vocabulary

biome (BY-ohm)—a place that has the same climate, plants, and animals over a large area
conifer (COH-nuh-fer)—a tree that makes seeds in cones
coniferous forest (coh-NIF-er-uhs for-ist)—a forest where conifers grow
deciduous forest (duh-SIJ-oo-uhs for-ist)—a forest where deciduous trees grow
deciduous tree (duh-SIJ-oo-uhs tree)—a tree that loses its leaves in the autumn
desert—a biome that receives very little rain
grassland—a flat biome that is covered with tall grasses
rainforest—a hot, wet biome where trees grow very tall and keep their leaves all year
tundra—a cold, northern biome where part of the soil is always frozen

Preparation/Materials

Discussion: Plant Variety

√ pictures of a wide variety of plants in their native habitats. Include at least one from each biome.

Demonstration: Different Plants in Different Surroundings

√ cactus
√ tropical plant
√ deciduous tree branch
√ conifer branch
√ wheat or other tall grass (with root)

Demonstration: Duckweed

√ large jar of water
√ duckweed

Background

God maintains plants on nearly every landmass in the world. He adapts different types of plants for different climates and soil types. The major land biome types are deciduous forests, coniferous forests, rainforests, grasslands, deserts, and tundra.

Forest biomes grow in locations where there is enough rainfall, moderate temperature ranges, and low risk of devastating fires. Specific types of trees and other plants dominate these forest biomes.

Deciduous forests dominate much of Europe, eastern Asia, and the northeastern United States and Canada. Deciduous trees loose their leaves in the autumn. They require four to six months of warm weather to be able to make enough food. Deciduous trees can't survive the short summer seasons and cold climates of northern regions, and they can't compete with the fast growing tropical plants of equatorial climates. Deciduous trees need 75–125 cm (30–50 inches) of rain each year.

Coniferous forests are dominated by conifer trees. Conifers produce seeds in cones, and their leaves are usually needlelike or scalelike with thick waxy coverings to prevent water loss in cold temperatures. Conifers shed their needles throughout the year, not all at once. They grow in areas that have cold temperatures and an annual rainfall of 35–75 cm (14–30 inches).

Tropical trees and plants live in rainforests. Rainforests have a high diversity of plants and other organisms because they are bathed in the constant light and warmth of an equatorial climate. Most tropical plants don't lose their leaves during a season, and their broad leaves compete with other plants for capturing sunlight. Most tropical plants grow quickly to maximize their exposure to the sun.

Many biomes don't have the right climate to support forests. Grasslands dominate many of these areas. (Specific types of grasslands are plains, steppes, savannahs, prairies, and pampas.) A wide variety of grasses and other organisms thrive in grasslands, but most of the plants have been plowed up to grow food crops.

Deserts, biomes that receive less than 25 cm (10 inches) of rain a year, are usually hot and dry. Desert plants can live in dry conditions. Cacti store water in their roots and stems, and they have needlelike leaves to deter predators. Some desert plants have a wide, shallow network of roots for collecting scarce rainfall; other desert plants sink deep taproots down toward the ground water. Many desert flowers have short life cycles—when it rains they grow, bloom, reproduce, and die in just a few weeks or even days.

The soil beneath the surface of the tundra biome is permanently frozen, forming a permafrost layer. Shallow-rooted plants such as grasses, sedges, and woody shrubs are adapted for life in this biome.

God also makes plants that live in water. While too much water causes most plants to rot or become infected, water plants float on water or are even submerged under the water. Water lilies float, and plants such as the fanwort live completely under water. Other plants, such as the spearwort, are rooted under water and emerge from beneath the surface to grow flowers to attract insects for pollination. Reeds, rushes, and cattails form thick beds on the edges of shallow water.

Lesson 2

Where Do Plants Live?

Would you expect to see a cactus at the North Pole? Would you expect to see a palm tree in the desert? Would you expect to see a pine tree in the rain forest? Why or why not?

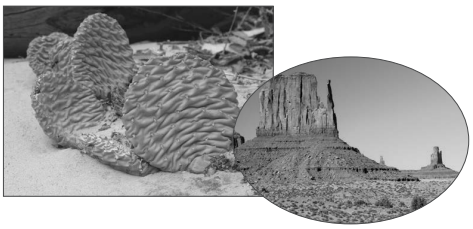
Like all other living things, plants have needs. Plants must live in places that meet these needs. A desert meets the needs of a cactus but not the needs of a palm tree. A rainforest meets the needs of a palm tree but not of a pine tree. The North Pole meets the needs of very few plants.

God provides different places on Earth with different conditions. Some places are dry, and others are wet. Some places are warm all of the time, others get cold in the winter, and others are always cold. Each kind of place has specific kinds of plants.

A place that has the same climate, plants, and animals over a large area is called a **biome** (BY-ohm). The major types of land biomes are desert, tundra, grassland, deciduous forest, coniferous forest, and rainforest. Which biome do you live in? To help answer this question, let's find out what each biome is like.

A **desert** is a biome that receives very little rain. Not many types of plants can live in deserts because most plants need more water. One type of plant that can live in the desert is a cactus. A cactus stores water inside its tissues and has a waxy coating that keeps it from losing water. It also has needles. Needles lose water more slowly than

leaves do. They also keep animals from eating the plant or trying to get water from it.



A **tundra** is a cold, northern biome where part of the soil is always frozen. Only a few types of plants can grow in this poor soil. These plants grow only in the summer.

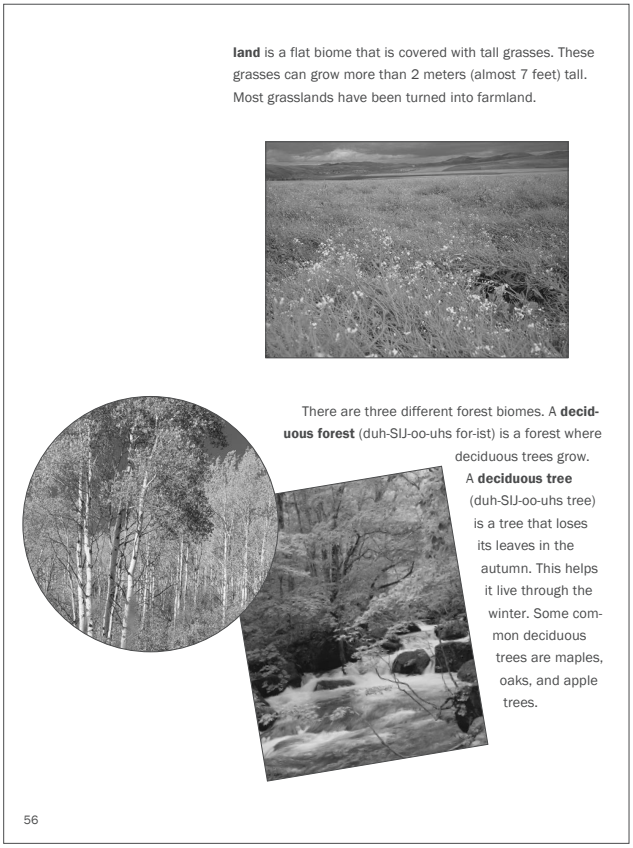
A **grass-**

Discover

Discussion: Plant Variety. Discuss plants that students would expect to see in different parts of the world. Ask if they would expect to see the same plants in Florida and Hawaii as they would in Alaska or the Northwest Territories. If any students have traveled to other biomes, have them discuss the different plants they have seen. Show them pictures of plants in their native habitats. Discuss what the weather of each habitat is like, and note that different kinds of plants grow in different places. Wonder aloud why this is, and encourage students to speculate.

Develop

1. **Demonstration: Different Plants in Different Surroundings.** Display a cactus, tropical plant, deciduous tree branch, the branch of a conifer tree, and wheat or other tall grass (with root). Ask students to evaluate the leaves of these different plants and hypothesize about the environments they live in based on their observations. Ask them to explain how the specific features of each plant equip each plant for survival in its environment.
   - Tropical plants have large leaves that are not shed as seasons change, because tropical leaves can afford to lose a lot of water. For this reason, tropical plants require high amounts of rainfall, but their large leaves collect more sunlight.
   - To prevent water loss, many species of cacti don't have true leaves. Their needles protect their stems, where they store water.

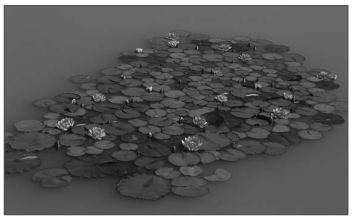


- Deciduous trees have broad leaves for collecting a lot of sunlight, but they shed their leaves during the winter to prevent water loss during the dry, cold season.
- Conifer needles are small and covered with a thick, waxy coating to prevent water loss. The small size of their leaves helps conifer trees survive cold weather, but they collect much less sunlight.
- Grasses have tough roots that grow deep to find water when there is little rain. The roots also help the plant survive being trampled by grazing animals such as bison.

2. **Demonstration: Duckweed.** Place some duckweed in a jar of water. Explain that most plants live on land, but some plants, such as duckweed, live in water. Duckweed, a common plant that lives on the surface of still water, is the smallest flowering plant in the world. The smallest duckweed plant measures 1 mm long and weighs the same as two grains of salt. Duckweed reproduces every 30–36 hours, so in a 4-month summer season, a duckweed plant can conceivably reproduce 10 billion (1×10^{10}) plants.

3. Have students observe the plants growing from the previous lesson and evaluate each plant's growth and health. Ask students what things are affecting how healthy the plants are and how well they are growing. For example, some plants do well in direct sunlight, but others don't. Plants need water, but too much water kills most plants.

Have you ever seen plants floating on top of the water or growing up out of a pond or lake? Aquatic plants live in the water instead of on land. Water lilies, duckweed, and reeds are common aquatic plants.



Intersection with Math

Water Needs of Plants

Different types of plants need different amounts of water. Look at the data table to find out how much water different types of plants need. Make a bar graph of the smallest amount of rainfall that these different types of plants need each year. Make a second bar graph showing the most rainfall that these different types of plants need each year.

Plant Water Needs

Type of Plant	Rainfall Needed Each Year (cm)
Conifers	35–75
Deciduous trees	75–125
Desert plants	0–25
Grasses (in grasslands)	25–75
Tropical trees	400–2500
Tundra plants	30–50

The structure that God gives each plant helps it thrive in a certain biome. What's your favorite plant? How does its structure help it live in the biome where it is located?

Think Back

1. What is a biome?
2. Name the six major land biomes.
3. Compare the biome that you live in to another biome.
4. Explain what would happen if you planted a deciduous tree in a desert.
5. Explain why forests are important to the rest of God's creation.

Reinforce/Assess

Have students read **Where Do Plants Live?** (page 54) in the student text and complete the **Think Back** questions (page 59) as homework.

1. *What is a biome? (A biome is a place that has the same climate, plants, and animals over a large area.)*
2. *Name the six major land biomes. (The six major land biomes are desert, grassland, tundra, deciduous forest, coniferous forest, and rainforest.)*
3. *Compare the biome that you live in to another biome. (Answers will vary but should reflect knowledge of climates and plant types.)*
4. *Explain what would happen if you planted a deciduous tree in a desert. (The tree wouldn't get enough water. It would die.)*
5. *Explain why forests are important to the rest of God's creation. (Answers will vary but may include that forests provide beauty, and they provide homes for animals. They provide food and wood for people. Students may also realize that they generate oxygen, prevent erosion, and add to the water cycle.)*

Extend

- Have students complete Intersection with Math: Water Needs of Plants (page 58) in the student text.
- Show the video series from *Planet Earth* to introduce the amazing diversity of the different biomes God created.

- Have students collect pictures of plants living in extreme environments—such as in the water, desert, or tundra. Have them use their pictures to make a collage for a bulletin board display.
- Have students act out what would happen if plants from different environments gathered together for a social event. What environmental conditions would the room have? How would different plants react to conditions outside their comfort levels? What comments would be made?

Thank you for your interest in Christian Schools International's 2nd Edition Science curriculum!

This sample serves as a great reflection of the other engaging material available for kindergarten through grade 8.

The curriculum tools represented below work great together to assist you as you explore God's creation, promote effective learning, and provide a clear biblical perspective to your students.

Teacher Guide - a comprehensive guide that is informative and easy-to-use with detailed teaching strategies, reduced student text pages, numerous inquiry-based activities, cross-curricular activities, and activity sheets that involve investigating, making observations, experimenting, researching, charting, mapping, and more.

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