

TEACHER INTRODUCTION

WELCOME TO GOD'S DESIGN[®] FOR HEAVEN & EARTH

God's Design for Heaven and Earth is a series that has been designed for use in teaching earth science to elementary and middle school students. It is divided into three books: *Our Universe*, *Our Planet Earth*, and *Our Weather and Water*. Each book has 35 lessons including a final project that ties all of the lessons together.

In addition to the lessons, special features in each book include biographical information on interesting people as well as fun facts to make the subject more fun.

Although this is a complete curriculum, the information included here is just a beginning, so please feel free to add to each lesson as you see fit. A resource guide is included in the appendices to help you find additional information and resources. A list of supplies needed is included at the beginning of each lesson, while a master list of all supplies needed for the entire series can be found in the appendices.

Answer keys for all review questions, worksheets, quizzes, and the final exam are included

here. Reproducible student worksheets and tests may be found on the supplementary CD-Rom for easy printing. Please contact Answers in Genesis if you wish to purchase a printed version of all the student materials, or go to www.AnswersBookstore.com.

If you wish to get through the *Heaven and Earth* series in one year, plan on covering approximately three lessons per week. The time required for each lesson varies depending on how much additional information you include, but plan on 20 minutes per lesson for beginners (grades 1–2) and 40 to 45 minutes for grades 3–8.

Quizzes may be given at the conclusion of each unit and the final exam may be given after lesson 34.

If you wish to cover the material in more depth, you may add additional information and take a longer period of time to cover all the material, or you could choose to do only one or two of the books in the series as a unit study.

WHY TEACH EARTH SCIENCE?

It is not uncommon to question the need to teach children hands-on science in elementary or middle school. We could argue that the knowledge gained in science will be needed later in life in order for children to be more productive and well-rounded adults. We could argue that teaching children science also teaches them logical and inductive thinking and reasoning skills, which are tools they will need to be more successful. We could argue that science is a necessity in this technological world in which we live. While all of these arguments are true, not one of them is the main reason that we should teach our children science. The most important reason to teach science in elementary school is to give children an understanding that God is our Creator, and the Bible can be trusted. Teaching science from a creation perspective is one of the best ways to reinforce our children's faith in God and to help them counter the evolutionary propaganda they face every day.

God is the Master Creator of everything. His handiwork is all around us. Our great Creator put in place all of the laws of physics, biology, and chemistry. These laws were put here for us to see His wisdom and power. In science, we see the hand of God at work more than in any

other subject. Romans 1:20 says, "For since the creation of the world His invisible attributes are clearly seen, being understood by the things that are made, even His eternal power and Godhead, so that they [men] are without excuse." We need to help our children see God as Creator of the world around them so they will be able to recognize God and follow Him.

The study of earth science helps us to understand and appreciate this amazing world God gave us. Studying the processes that shape the earth, and exploring the origins of the earth and the universe often bring us into direct conflict with evolutionary theories. This is why it is so critical to teach our children the truth of the Bible, how to evaluate the evidence, how to distinguish fact from theory, and to realize that the evidence, rightly interpreted, supports biblical creation not evolution.

It's fun to teach earth science! It's interesting too. Rocks, weather, and stars are all around us. Children naturally collect rocks and gaze at the stars. You just need to direct their curiosity.

Finally, teaching earth science is easy. It's where you live. You won't have to try to find strange materials for experiments or do dangerous things to learn about the earth.

HOW DO I TEACH SCIENCE?

In order to teach any subject you need to understand how people learn. People learn in different ways. Most people, and children in particular, have a dominant or preferred learning style in which they absorb and retain information more easily.

If a student's dominant style is:

AUDITORY

He needs not only to hear the information but he needs to hear himself say it. This child needs oral presentation as well as oral drill and repetition.

VISUAL

She needs things she can see. This child responds well to flashcards, pictures, charts, models, etc.

KINESTHETIC

he needs active participation. This child remembers best through games, hands-on activities, experiments, and field trips.

Also, some people are more relational while others are more analytical. The relational student needs to know why this subject is important, and

how it will affect him personally. The analytical student, however, wants just the facts.

If you are trying to teach more than one student, you will probably have to deal with more than one learning style. Therefore, you need to present your lessons in several different ways so that each student can grasp and retain the information.

GRADES 1–2

Because *God's Design Science* books are designed to be used with students in grades 1–8, each lesson has been divided into three sections. The “Beginner” section is for students in grades 1–2. This part contains a read-aloud section explaining the material for that lesson followed by a few questions to make sure that the students understand what they just heard. We recommend that you do the hands-on activity in the blue box in the main part of the lesson to help your students see and understand the concepts.

GRADES 3–8

The second part of each lesson should be completed by all upper elementary and junior high students. This is the main part of the lesson containing a reading section, a hands-on activity that reinforces the ideas in the reading section (blue box), and a review section that provides review questions and application questions (red box).

GRADES 6–8

Finally, for middle school/junior high age students, we provide a “Challenge” section that contains more challenging material as well as additional activities and projects for older students (green box).

We have included periodic biographies to help your students appreciate the great men and women who have gone before us in the field of science.

We suggest a threefold approach to each lesson:

INTRODUCE THE TOPIC

We give a brief description of the facts. Frequently you will want to add more information than the essentials given in this book. In addition to reading this section aloud (or having older children read it on their own), you may wish to do one or more of the following:

- Read a related book with your students.
- Write things down to help your visual learners.
- Give some history of the subject. We provide some historical sketches to help you, but you may want to add more.
- Ask questions to get your students thinking about the subject.

MAKE OBSERVATIONS AND DO EXPERIMENTS

- Hands-on projects are suggested for each lesson. This part of each lesson may require help from the teacher.
- Have your students perform the activity by themselves whenever possible.

REVIEW

- The “What did we learn?” section has review questions.
- The “Taking it further” section encourages students to
 - Draw conclusions
 - Make applications of what was learned
 - Add extended information to what was covered in the lesson
- The “FUN FACT” section adds fun or interesting information.

By teaching all three parts of the lesson, you will be presenting the material in a way that children with any learning style can both relate to and remember.

Also, this approach relates directly to the scientific method and will help your students think more scientifically. The *scientific method* is just a way to examine a subject logically and learn from it. Briefly, the steps of the scientific method are:

1. Learn about a topic.
2. Ask a question.
3. Make a hypothesis (a good guess).

4. Design an experiment to test your hypothesis.
5. Observe the experiment and collect data.
6. Draw conclusions. (Does the data support your hypothesis?)

Note: It's okay to have a "wrong hypothesis." That's how we learn. Be sure to help your students understand why they sometimes get a different result than expected.

Our lessons will help your students begin to approach problems in a logical, scientific way.

HOW DO I TEACH CREATION VS. EVOLUTION?

We are constantly bombarded by evolutionary ideas about the earth in books, movies, museums, and even commercials. These raise many questions: What is the big bang? How old is the earth? Do fossils show evolution to be true? Was there really a worldwide flood? When did dinosaurs live? Was there an ice age? How can we teach our children the truth about the origins of

the earth? The Bible answers these questions and this book accepts the historical accuracy of the Bible as written. We believe this is the only way we can teach our children to trust that everything God says is true.

There are five common views of the origins of life and the age of the earth:

Historical biblical account	Progressive creation	Gap theory	Theistic evolution	Naturalistic evolution
Each day of creation in Genesis is a normal day of about 24 hours in length, in which God created everything that exists. The earth is only thousands of years old, as determined by the genealogies in the Bible.	The idea that God created various creatures to replace other creatures that died out over millions of years. Each of the days in Genesis represents a long period of time (day-age view) and the earth is billions of years old.	The idea that there was a long, long time between what happened in Genesis 1:1 and what happened in Genesis 1:2. During this time, the "fossil record" was supposed to have formed, and millions of years of earth history supposedly passed.	The idea that God used the process of evolution over millions of years (involving struggle and death) to bring about what we see today.	The view that there is no God and evolution of all life forms happened by purely naturalistic processes over billions of years. Ken Ham et al., <i>The Answers Book</i> , (El Cajon: Master Books, 2000), 33–76.

Any theory that tries to combine the evolutionary time frame with creation presupposes that death entered the world before Adam sinned, which contradicts what God has said in His Word. The view that the earth (and its “fossil record”) is hundreds of millions of years old damages the gospel message. God’s completed creation was “very good” at the end of the sixth day (Genesis 1:31). Death entered this perfect paradise *after* Adam disobeyed God’s command. It was the punishment for Adam’s sin (Genesis 2:16–17, 3:19; Romans 5:12–19). Thorns appeared when God cursed the ground because of Adam’s sin (Genesis 3:18).

The first animal death occurred when God killed at least one animal, shedding its blood, to make clothes for Adam and Eve (Genesis 3:21). If the earth’s “fossil record” (filled with death, disease, and thorns) formed over millions of years before Adam appeared (and before he sinned),

then death no longer would be the penalty for sin. Death, the “last enemy” (1 Corinthians 15:26), diseases (such as cancer), and thorns would instead be part of the original creation that God labeled “very good.” No, it is clear that the “fossil record” formed some time *after* Adam sinned—not many millions of years before. Most fossils were formed as a result of the worldwide Genesis Flood.

When viewed from a biblical perspective, the scientific evidence clearly supports a recent creation by God, and not naturalistic evolution and millions of years. The volume of evidence supporting the biblical creation account is substantial and cannot be adequately covered in this book. If you would like more information on this topic, please see the resource guide in Appendix A. To help get you started, just a few examples of evidence supporting biblical creation are given below:

Evolutionary Myth: The earth is 4.6 billion years old.

The Truth: Many processes observed today point to a young earth of only a few thousand years. The rate at which the earth’s magnetic field is decaying suggests the earth must be less than 10,000 years old. The rate of population growth and the recent emergence of civilization suggests only a few thousand years of human population. And, at the current rate of accumulation, the amount of mud on the sea floor should be many kilometers thick if the earth were billions of years old. However, the average depth of all the mud in the whole ocean is less than 400 meters, giving a maximum age for the earth of not more than 12 million years. All this and more indicates an earth much younger than 4.6 billion years.

John D. Morris, Ph.D., *The Young Earth* (Colorado Springs: Creation Life Publishers, 1994), 70–71, 83–90. See also: “Young age of the earth and universe” at www.answersingenesis.org/go/young.

Evolutionary Myth: The universe formed from the big bang.

The Truth: There are many problems with this theory. It does not explain where the initial material came from. It cannot explain what caused that material to fly apart in the first place. And nothing in physics indicates what would make the particles begin to stick together instead of flying off into space forever. The big bang theory contradicts many scientific laws. Because of these problems, some scientists have abandoned the big bang and are attempting to develop new theories to explain the origin of the universe.

Alex Williams & John Hartnett, Ph.D., *Dismantling the Big Bang* (Master Books, 2005). See also: “What are some of the problems with the ‘big bang’ hypothesis?” www.answersingenesis.org/go/big-bang.



Evolutionary Myth: Fossils prove evolution.

The Truth: While Darwin predicted that the fossil record would show numerous transitional fossils, even more than 145 years later, all we have are a handful of disputable examples. For example, there are no fossils showing something that is part way between a dinosaur and a bird. Fossils show that a snail has always been a snail; a squid has always been a squid. God created each animal to reproduce after its kind (Genesis 1:20–25).

Evolutionary Myth: There is not enough water for a worldwide flood.

The Truth: Prior to the Flood, just as today, much of the water was stored beneath the surface of the earth. In addition, Genesis 1 states that the water below was separated from the water above, indicating that the atmosphere may have contained a great deal more water than it does today. Also, it is likely that before the Flood the mountains were not as high as they are today, but that the mountains rose and the valleys sank *after* the Flood began, as Psalm 104:6–9 suggests. At the beginning of the Flood, the fountains of the deep burst forth and it rained for 40 days and nights. This could have provided more than enough water to flood the entire earth. Indeed, if the entire earth's surface were leveled by smoothing out the topography of not only the land surface but also the rock surface on the ocean floor, the waters of the present-day oceans would cover the earth's surface to a depth of 1.7 miles (2.7 kilometers). Fossils have been found on the highest mountain peaks around the world showing that the waters of the Flood did indeed cover the entire earth.

Ken Ham et al., *The Answers Book*, (Master Books, 2000), 149–158.

Evolutionary Myth: Slow climate changes over time have resulted in multiple ice ages.

The Truth: There is widespread evidence of glaciers in many parts of the world indicating one ice age. Evolutionists find the cause of the Ice Age a mystery. Obviously, the climate would need to be colder. But global cooling by itself is not enough, because then there would be less evaporation, so less snow. How is it possible to have both a cold climate and lots of evaporation? The Ice Age was most likely an aftermath of Noah's Flood. When "all the fountains of the great deep" broke up, much hot water and lava would have poured directly into the oceans. This would have warmed the oceans, increasing evaporation. At the same time, much volcanic ash in the air after the Flood would have blocked out much sunlight, cooling the land. So the Flood would have produced the necessary combination of increased evaporation from the warmed oceans and cool continental climate from the volcanic ash in the air. This would have resulted in increased snowfall over the continents. With the snow falling faster than it melted, ice sheets would have built up. The Ice Age probably lasted less than 700 years.

Michael Oard, *Frozen in Time*, Master Books, 2004. See also www.answersingenesis.org/go/ice-age



Evolutionary Myth: Thousands of random changes over millions of years resulted in the earth we see today.

The Truth: The second law of thermodynamics describes how any system tends toward a state of zero entropy or disorder. We observe how everything around us becomes less organized and loses energy. The changes required for the formation of the universe, the planet earth and life, all from disorder, run counter to the physical laws we see at work today. There is no known mechanism to harness the raw energy of the universe and generate the specified complexity we see all around us.

John D. Morris, Ph.D., *The Young Earth*, (Colorado Springs: Creation Life Publishers, 1994), 43. See also www.answersingenesis.org/go/thermodynamics.

Despite the claims of many scientists, if you examine the evidence objectively, it is obvious that evolution and millions of years have not been proven. You can be confident that if you teach that what the Bible says is true, you won't go wrong. Instill in your student a confidence in the truth of the Bible in all areas. If scientific thought seems to contradict the Bible, realize that scientists often make mistakes, but God does not lie. At one time scientists believed that the earth

was the center of the universe, that living things could spring from non-living things, and that blood-letting was good for the body. All of these were believed to be scientific facts but have since been disproved, but the Word of God remains true. If we use modern "science" to interpret the Bible, what will happen to our faith in God's Word when scientists change their theories yet again?

INTEGRATING THE SEVEN C'S INTO YOUR CURRICULUM

Throughout the *God's Design® for Science* series you will see icons that represent the Seven C's of History. The Seven C's is a framework in which all of history, and the future to come, can be placed. As we go through our daily routines we may not understand how the details of life connect with the truth that we find in the Bible. This is also the case for students. When discussing the importance of the Bible you may find yourself telling students that the Bible is relevant in everyday activities. But how do we help the younger generation see that? The Seven C's are intended to help.

The Seven C's can be used to develop a biblical worldview in students, young or old. Much more than entertaining stories and religious teachings, the Bible has real connections to our everyday life. It may be hard, at first, to see how many connections there are, but with practice, the daily relevance of God's Word will come alive. Let's look at the Seven C's of History and

how each can be connected to what the students are learning.



CREATION

God perfectly created the heavens, the earth, and all that is in them in six normal-length days around 6,000 years ago.

This teaching is foundational to a biblical worldview and can be put into the context of any subject. In science, the amazing design that we see in nature—whether in the veins of a leaf or the complexity of your hand—is all the handiwork of God. Virtually all of the lessons in *God's Design for Science* can be related to God's creation of the heavens and earth.

Other contexts include:

Natural laws—any discussion of a law of nature naturally leads to God's creative power.

OUR UNIVERSE

UNIT 1: SPACE MODELS & TOOLS 16

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UNIT 1

SPACE MODELS & TOOLS

LESSON

1

INTRODUCTION
TO ASTRONOMY

STUDY OF SPACE

SUPPLY LIST

- Bible Copy of “God’s Purpose for the Universe” worksheet
- Supplies for Challenge: Copy of “Knowledge of the Stars” worksheet

BEGINNERS

- What is astronomy? **The study of the things in space.**

GOD’S PURPOSE FOR THE UNIVERSE WORKSHEET

1. I was designed to rule the day: **Sun/greater light.**
2. I was designed to rule the night: **Moon/lesser light.**
3. We are times that are to be marked by the movement of the sun, moon, and stars: **Seasons, days, and years.**
4. Besides marking times, I am another reason why the sun, moon, and stars were made: **To give light and to show signs.**
5. We were made by God’s hands and this is what will eventually happen to us: **Heavens and earth will perish and wear out.**
6. This is higher than me (the earth): **The heavens.**
7. I am what you will see in the heavens in the last days: **Wonders, sun to darkness, moon to blood.**
8. I (the sun), stood still for this long, until Joshua and the Israelites defeated their enemies: **About a full day.**

WHAT DID WE LEARN?

- What is astronomy? **The study of the stars, planets, moons, and other items in space.**
- Why should we want to study astronomy? **To learn more about God’s creation and see His glory.**

TAKING IT FURTHER

- What is one thing you really want to learn during this study? **Answers will vary.**
- Write your question or questions on a piece of paper and save it to make sure you find the answers by the end of the book. **Encourage the student to do this and keep it in an accessible place.**

CHALLENGE: KNOWLEDGE OF THE STARS WORKSHEET

1. What is the nearest star to the earth? **Sun.**

2. What are the main elements in stars? **Hydrogen and helium.**
3. What is the name of the galaxy that we live in? **Milky Way.**
4. What is special about Polaris, the North Star? **It does not appear to move through the sky like the other stars.**
5. What unit of distance is used to measure items in space? **Light year, parsec, or astronomical unit.**
6. What name describes when one celestial body blocks the light from another? **Eclipse.**
7. What force holds the planets in their places? **Gravity.**
8. Name three items found in space besides stars, moons, and planets. **Comets, asteroids, meteors, plutoids, space junk, satellites, space station.**
9. Name two scientists important to our understanding of astronomy. **Newton, Galileo, Copernicus, Kepler, Hubble.**
10. How long does it take for light to travel from the sun to the earth? **About 8 minutes.**

LESSON

2

SPACE MODELS

WHAT'S REALLY OUT THERE?

SUPPLY LIST

Book Piece of paper Ping-pong ball Golf ball

BEGINNERS

- Does the sun move around the earth or does the earth move around the sun? **The earth moves around the sun.**
- What force keeps all the planets, moons, and stars in their places? **Gravity.**

WHAT DID WE LEARN?

- What are the two major models that have been used to describe the arrangement of the universe? **Geocentric/Ptolemaic—earth centered, and Heliocentric/Copernican—sun centered.**
- What was the main idea of the Geocentric Model? **The earth was the center of the universe and everything revolved around it.**
- What is the main idea of the Heliocentric Model? **The sun is the center of the solar system and the earth and other planets revolve around it.**
- What force holds all of the planets in orbit around the sun? **Gravity.**

TAKING IT FURTHER

- Which exerts the most gravitational pull, the earth or the sun? **The sun because it is much more massive than the earth.**
- If the sun has a stronger gravitational pull, then why aren't objects pulled off of the earth toward the sun? **The strength of the gravitational pull decreases with distance. The pull of the earth is stronger on us because we are so much closer to the center of the earth than we are to the sun. If an object moves far enough away from the earth, the earth's gravity no longer has much effect on it. And if that object moves close enough to the sun, it will be pulled into the sun by the sun's gravity.**



LESSON

3

THE EARTH'S MOVEMENT

ROTATING AND REVOLVING

SUPPLY LIST

Flashlight Basketball or volleyball Masking tape
 Supplies for Challenge: Copy of "Clock" pattern Tripod Thread Needle
 Modeling clay Turntable, swivel chair or stool, Lazy Susan, etc.

BEGINNERS

- In what two ways is the earth moving? **Rotating on its axis and orbiting or revolving around the sun.**
- Why do we experience seasons like summer and winter? **The earth is tilted with respect to the sun. When your part of the earth is tilted toward the sun it is summer, and when it is tilted away from the sun it is winter.**

WHAT DID WE LEARN?

- What are the two different types of motion that the earth experiences? **Rotation on its axis and revolution around the sun.**
- What observations can we make that are the result of the rotation of the earth on its axis? **Day and night, the stars rotating in the sky, the bulging of the earth, diagonal air flow.**
- What observations can we make that are the result of the revolution of the earth around the sun? **Changing of the seasons, parallax of stars, more meteors observed after midnight.**
- What is a solstice? **The first day of summer or the first day of winter, when the earth is in the place in its orbit where the sun is hitting directly on either the Tropic of Cancer or the Tropic of Capricorn.**
- What is an equinox? **The first day of spring or the first day of autumn, when the earth is halfway between the solstices.**

TAKING IT FURTHER

- What are the advantages of the earth being tilted on its axis as it revolves around the sun? **This gives us seasons. Without this tilt, the temperatures would be relatively stable year round. This would result in less of the earth being able to grow crops. Only the warm areas near the equator would have warm enough weather to grow food.**
- One argument against Copernicus's theory was that if the earth were moving, flying birds would be left behind. Why don't the birds get left behind as the earth moves through space? **The atmosphere in which the birds are flying moves with the earth because of gravity.**

CHALLENGE: FOUCAULT PENDULUM

- What forces are affecting the pendulum? **Gravity is pulling down on the weight at the end of the pendulum, and air is resisting the movement of the pendulum.**
- Why does the pendulum eventually stop moving? **Because of the air resistance.**
- How does a Foucault pendulum keep moving for hours or days at a time without stopping? **They are often designed with an iron ring near the top where the pendulum is attached to the building. Also, there are electromagnets placed around the ring. As the pendulum swings through a certain part of its arc the magnet turns on, attracting the ring. Then the magnet turns off to allow the pendulum to swing freely. This magnet system compensates for the air resistance that the pendulum experiences, so it does not slow down.**

MASTER SUPPLY LIST

The following table lists all the supplies used for *God's Design for Heaven & Earth* activities. You will need to look up the individual lessons in the student book to obtain the specific details for the individual activities (such as quantity, color, etc.). The letter *c* denotes that the lesson number refers to the challenge activity. Common supplies such as colored pencils, construction paper, markers, scissors, tape, etc., are not listed.

Supplies needed (see lessons for details)	Our Universe	Our Planet Earth	Our Weather & Water
Alum (look in grocery spice aisle)		10	
Aluminum foil	20, 29		
Aquarium or other empty case	22		31
Baking soda		24	
Balloons	30		3
Bar of soap		28	
Basketball or volleyball	3, 14, 25		
Bathroom scale	27		
Bible	1, 18c, 35	35	35
Bottle with lid			22, 28
Building blocks	33	22	
Calculator	6c, 27		
Candle	22		2
Cardboard	11c	33	
Cereal bowls	23		
Chocolate chip cookies		17	
Chocolate chips		8, 8c, 25	
Chocolate syrup		25	
Clipboard	15c		
Collander		31c	
Cookie crumbs		25	
Cornstarch		11	
Cotton balls			11
Craft sticks		10	
Craft wire	34		
Cups (clear plastic or glass)	15, 19c, 21c, 22, 23c, 26		
Dirt/soil (from your yard)		29, 30, 30c, 31, 31c	
Display box (optional)		34	
Dry ice	22		10c
Duct tape			16, 22
Egg carton		15c	

Supplies needed (see lessons for details)	Our Universe	Our Planet Earth	Our Weather & Water
Epsom salt		13, 33	
Eye protection (goggles)		16	
Fine mesh strainer		31c	
Flashlight	3, 4, 6, 7, 14, 15c, 16, 19c, 21c 26, 35		
Flour	10		12
Food coloring	26	24	22, 25
Glitter	9		
Global warming articles			8
Globe of the earth	21		
Gloves	22	7, 7c	10c
Golf ball	2, 10		
Graham crackers		19c	
Graph paper	20c		2c, 21c
Gumballs		8	
Hairdryer	19		
Hammer		16	
House plant			6
Ice	15, 19	6	10
Ice cream		25	
Index card	12c, 19c, 25c, 34c		
Jar with lid		3, 7c, 8	2, 3c, 10, 19, 25, 26, 28
Lamp			4
Liquid dish soap	22		
Magnet	28		
Magnifying glass	4, 19c	10c, 16, 31	
Marbles	10, 23		
Marshmallows (large)		8	
Masking tape	3, 18	1, 16	3, 4, 14, 19, 26
Matches	22		2, 11c
Metal clothes hanger			14
Milk	21c		
Milk carton (empty, ½-gallon)		7	
Mirror	4, 12, 33		6
Model rocket and launch pad (optional)	29		
Modeling clay	3c, 20c, 25c, 29	12, 22c, 28, 32	2, 22, 29, 31, 34
Motorcycle helmet with face plate, or bike helmet (optional)	33		
Newspaper		7c, 21, 24, 31c	1, 5, 21
Nut and bolt	33		

Supplies needed (see lessons for details)	Our Universe	Our Planet Earth	Our Weather & Water
Orange (fruit)	21		
Paint	25, 34	11	
Paint roller pan			28
Paper cups		10, 11c, 30c, 31c, 33	
Peanut butter (creamy) or frosting		19c	
Pencils (wooden)	25c		
Petroleum jelly		12	
pH testing paper (optional)			12c
Piece of cloth			15, 18
Ping-pong ball	2, 25		
Plaster of Paris		11c, 12	
Plastic bottle (empty, 2-liter)		24	11c, 13, 16, 22, 26
Plastic grocery bag			3c
Plastic lid or dish	28		
Plastic tornado tube (optional but recommended)			16
Plastic tubing (clear)			22
Plastic wrap	20		
Plastic zipper bag		7c, 8c, 28c	10
Playing cards			30
Poster board/tagboard	9, 28, 29	34	22
Potting soil		31	
Prism (optional)	12		
Protractor	25c		
Real chalk (made from limestone, not sidewalk chalk) or limestone rock		28	
Reflector (like from a bicycle)	16		
Rock and mineral guide		10c, 11c, 14c, 16, 34	
Rock and mineral samples		9c, 10c, 11c, 14c, 15c, 16, 34	
Rolling pin		23	
Rubber band			18
Ruler	6, 20c		
Salt	10		24
Sand		11	19, 28
Shaved ice (or fresh snow if available)		14	
Shoe box	20, 20c	23	10c
Short ruler (6-inch)			22
Sidewalk chalk	13		
Sling psychrometer (optional)			18
Soft drink (unopened can)		25c	

Supplies needed (see lessons for details)	Our Universe	Our Planet Earth	Our Weather & Water
Sponges		13, 21c	
Star chart	5		
Steel BBs	28		
Steel wool without soap		28c	
Stop watch		31c	
Straw	30	27, 28	22
String	11c, 20c, 26c, 30	1, 33	3, 4, 12, 22, 26
Stuffed animal			15
Styrofoam balls	9, 29, 34		
Styrofoam rings	34		
Taffy or other soft candy		14	
Tea bag	23c		
Telescope (optional)	4, 16c		
Tennis ball	14	1	
<i>The Magic School Bus on the Ocean Floor</i>			29
Thermometer	15, 20		18
Thumb tacks	11c		
Toothpicks		8, 17	
Tops (spinning toys)	18		
Towel	19		
Toy boat		6	
Toy houses, cars, etc.	10		
Tracing paper		19	
Trash bag (large)			14
Tripod	3c		
Turntable (swivel chair, stool, Lazy Susan, etc.)	3c		
Unglazed ceramic tile		16	
Vinegar		24, 28	
Washer	20c, 26c		
Waxed paper	32	8, 14, 19c	
Weather station (optional)			22
Winter clothes	33		
Wooden stick (small, skewer-like)			22
World atlas/map	21	5c, 20c, 24c	5, 23
Yard stick/meter stick	6, 12c		3