Unit One
Getting Started

Unit Timeline

250 B.C. Eratosthenes estimates the size of Earth.

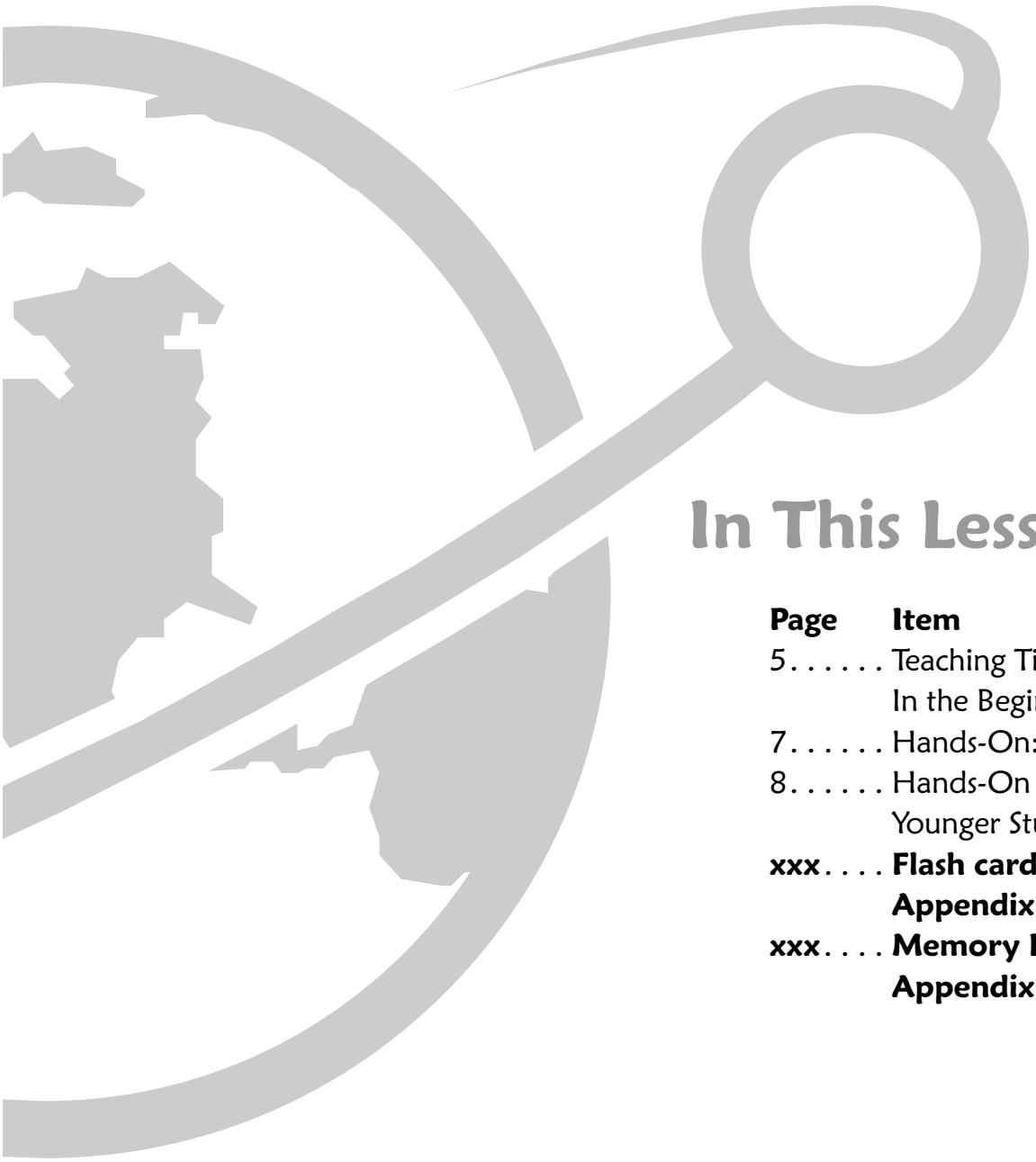
1970 Earth Day—April 22—is established. Earth Day is intended to recognize the impact of humans on this planet.

Unit One Vocabulary

- axis
- circumference
- core
- crust
- inner core
- lithosphere
- lower mantle
- outer core
- revolve
- rotate
- upper mantle

Materials Needed for This Unit

- Science notebook
- Photocopy of the world map in Appendix A
- Photocopy of "Earth's Structure Pattern" in Appendix A
- Photocopy of the unlabeled "Structure of Earth" diagram in Appendix A
- Globe
- Colored markers or pencils
- Scissors
- Double-sided tape
- Modeling clay or play dough in five different colors
  (See the recipe for play dough in Appendix E.)
- Dental floss
- Camera
- Materials for Unit Wrap-Up (See Lesson 3.)



In This Lesson:

Lesson 1

EARTH'S CREATION

Teaching Time:

In the Beginning...

God created the heavens and the earth. Did you notice that the Bible mentions "the earth," specifically? It does not say, "God created Mercury, Mars, Venus, Jupiter, Saturn, Uranus, Neptune, Pluto, and Earth. It says, "the heavens and the earth." Wow! God must think that Earth is pretty special to single it out in that way. One of my favorite Bible teachers suggests that people are the reason Earth is so special to God. After all, He made us and loves us.

In my opinion, that gives us two very good reasons to study Earth. First of all, God created it and thought it was important enough to tell about in His written Word, the Bible. Second, we live here. We should be interested in learning about the place where we live. I don't know about you, but even though I like learning about other planets, I like learning about Earth the most. After all, it directly affects me.

Let's go back to Genesis 1 and see what else we can learn about the creation of Earth. Genesis 1:2 tells us four things

Scripture
In the beginning God created the heavens and the earth. (Genesis 1:1)

Additional Notes

about Earth when it was first created by God. "The earth was without form, and void; and darkness was on the face of the deep. And the Spirit of God was hovering over the face of the waters." Did you see the four things?

1. The earth was without form.
2. The earth was void.
3. Darkness was on the face of the deep.
4. The Spirit of God was hovering over the face of the waters.

The Bible also tells us about the days of creation. In your Bible read Genesis 1:3–31. In your science notebook, list what God created on each day. Next, look at Genesis 2:1, 2. What happened on the seventh day? Yes, God rested.

As we explore Earth and outer space this year, we will build on the things we have just studied. God is the source of all. According to the Bible, there is nothing accidental about Earth. It is God's masterpiece.

Before we end this lesson, let's look at one more thing. Genesis 1:1 says, "In the beginning . . ." This is not the only place in Scripture where we learn about creation. We can also look in John 1. John 1 also tells us about the beginning. Let's read it together.

> In the beginning was the Word, and the Word was with God, and the Word was God. He was in the beginning with God. All things were made through Him, and without Him nothing was made that was made. In Him was life, and the life was the light of men. And the light shines in the darkness, and the darkness did not comprehend it. (John 1:1–5)

"The Word" is Jesus Christ. When God created the world, He was there; His Spirit was there "hovering over the face of the waters"; and His Son, Jesus, was there. They are all part of one God, and all were present at the creation of Earth.

We will learn so much about the Earth that God created, as well as about the planets in space. Let's have fun and explore!

Hands-On

Map It!

Featured Activity

Objective:

To become familiar with the components of Earth.

Materials

- Globe
- Photocopy of the world map in Appendix A
- Memorization lists from Appendix B

Instructions

1. Locate the seven continents on the globe and list them in your science notebook.

2. On the world map, label the continents.

3. Locate the oceans on the globe and list them in your science notebook.

4. Label the oceans on your map.

5. Locate the equator on your globe.

6. Label the equator on your map.

7. Locate as many seas as you can and list them in your science notebook.

Scripture

To see for yourself that "the Word" in John 1 is Jesus, continue reading through verse 17 and see who John is talking about.

Discovery Zone

Check out the "Recipe for Planet Earth" at www.factmonster.com. Select "Science," then "Environment."

Additional Notes

8. Label the seas on your map.

9. Using the lists in Appendix B, make flash cards for memory work. Daily practice with these will help you memorize them more quickly.

Activity for Younger Students

Globe Activity

1. Use a globe to point out the continents and oceans.
2. Count how many continents there are.
3. Count the oceans.
4. Find the equator.

In This Lesson:

Lesson 2

FACTS ABOUT EARTH AND ITS STRUCTURE

Teaching Time:

Just the Facts, Ma'am

In the last lesson, we looked at the creation of Earth and God's role as Creator. Today, we're going to study many facts about Earth. When I study these facts, I am more certain than ever that God created our whole universe with design and purpose.

The Revolving Earth

Our Earth is one of nine planets that **revolve**, or move around, the Sun in a pattern. It is 93 million miles from Earth to the Sun. This distance is the exact distance necessary for water to exist in liquid form without boiling. If Earth were any closer to the Sun, life could not exist here because it would be entirely too hot. If Earth were any farther away from the Sun, it would be far too cold for life to exist. In other words, Earth is in exactly the right place. It is the only planet in our solar system proven capable of supporting life.

Scripture

"'Where were you when I [God] laid the foundations of the earth? Tell Me, if you have understanding. Who determined its measurements?'" (Job 38:4–5)

Name It!

Revolve

Please provide definition in text file.

Earth's Rotation

In addition to revolving around the Sun, Earth **rotates** on its **axis**. Do you know what the axis is? Do you know what rotation is? Rotation is a spinning motion. The axis is an imaginary rod through the center of Earth around which Earth rotates. Did you get that? If not, do the activity listed in the margin. It will help you to understand rotation and axis.

Earth rotates at a speed of more than 1,000 miles per hour at the equator, taking 24 hours to complete one full rotation. This rotation is perfect. A different speed could cause us to be exposed either too long to the Sun, or not long enough. This would not be a good thing.

Activity

Make a play-dough ball to represent Earth. Insert a toothpick through the center of the ball so that it sticks out each end. This represents the axis. Tilt your whole Earth slightly and spin it around the axis. This represents rotation.

Activity

"Revolving" Demo

1. Place a chair in the middle of the room. The chair represents the Sun. You represent Earth.
2. Walk around the chair in a big circle. You are revolving around the chair.
3. Face the chair. The front of your body is having daytime.
4. Slowly spin in place. You are rotating. As you spin, notice where your body is facing. Stop with your back toward the chair. Is it still daytime for the front of your body? Why or why not?
5. Finally, making sure nothing breakable is in your path, combine walking around the chair (revolving) with your spinning (rotating) motion. Earth rotates on its axis as it revolves around the Sun.

The Rising and Setting Sun

You might be making a discovery right about now. You might be realizing that Earth's rotation causes our nights and our days. When Earth rotates, different parts of Earth face the Sun. Up until now, you may have thought that the Sun moves across the sky. You're not alone. Many children believe this because it actually looks that way. We may say "the Sun rises" and "the Sun sets," but in truth, Earth is the one moving. Earth rotates in an eastward direction, causing the Sun to appear to "rise" in the east and "set" in the west. We will explore all of this and more in our hands-on activity later in this lesson. For now, it's enough to work on learning the facts.

Measuring Earth

Let's add a few more facts to our lesson. Earth's **circumference** (sir **come** fer unce) is its measurement all the way around the equator. The circumference of Earth is 24,870 miles. This makes it the fifth largest planet in the solar system.

These facts are all part of what makes Earth so special. As we revolve around the Sun and rotate on the axis, let's give glory to God for His wonderful creation.

Earth Facts Summary

- Earth revolves around the Sun.
- Earth is 93 million miles from the Sun.
- Earth rotates on its axis at a speed of 500 miles per hour.
- It takes 24 hours for Earth to complete one full rotation.
- The circumference of Earth is 24,870 miles.
- Earth is the fifth largest planet in the solar system.

Now that you have learned some basic facts about Earth, it's time to go deeper—all the way to the center of our Earth!

What's Inside Earth?

You learned that the circumference is the measure around Earth and that it is 24,870 miles. That is the same as traveling from New York to California and back again four times! Look on a map of the United States and locate New York and California. If you could drill a hole all the way to Earth's center (and you can't), you would find it to be 3,950 miles down. That's a little more than the distance from New York to California one time. Obviously, the distance around Earth is much more than the distance to the center of Earth, but both distances are quite far. Let's find out what's inside Earth.

The very center of Earth is called the **inner core**. The inner core is made up of solid iron. Around the inner core is the **outer core**. The outer core consists of liquid iron and nickel. We refer to both of these sections together as simply the core. The temperature at the core of Earth is 5,432 degrees Fahrenheit.

The section of Earth surrounding the core is the **lower mantle**. The lower mantle is made up of solid rock.

After the core and the lower mantle, there is the **upper mantle**, which is solid rock like the lower mantle. Around all of this, on the very outside of Earth, is the **crust**. The crust is about six miles thick. Together, the crust and the upper mantle form the **lithosphere**.

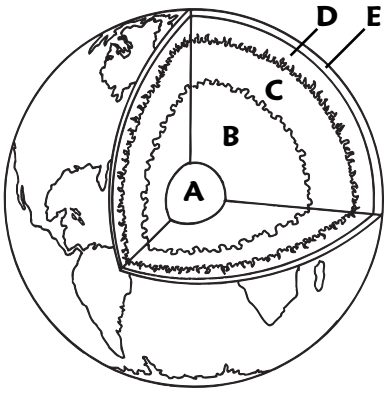
The cutaway "Structure of Earth" diagram in this lesson will help you better understand and visualize these layers in our Earth.

Name It!

Rotate
To spin on an axis, either real or imaginary.

Circumference
Measurement around an object.

Axis
Imaginary rod through the center of Earth around which Earth rotates.



A. Inner core
The very center of Earth; made up of solid iron.

B. Outer core
The area of Earth that surrounds the inner core; made up of liquid iron and nickel.

C. Lower mantle
The area inside Earth that is solid rock and surrounds the core.

D. Upper mantle
The area inside Earth that surrounds the lower mantle and is made of solid rock.

E. Crust
Outermost layer of Earth; about six miles thick.

Name It!

core
The area inside Earth made up of the inner and outer cores combined.

lithosphere
The part of Earth made up of the upper mantle and the crust.

Hands-On:

Make a Model of Earth's Structure

Featured Activity

Objective

To learn the order of the layers in Earth's structure.

Materials

- Colored markers or pencils
- Photocopy of "Earth's Structure Pattern" in Appendix A
- Scissors
- Double-sided tape

Instructions

1. Color each circle in the pattern a different color. Make sure the colors are light enough to allow the labels to show through.

2. Cut out each circle.

3. Begin with the smallest circle. Center it in the next largest circle and adhere.

4. Continue this process with each next largest circle until all the circles are taped together, with the largest being the last one.

5. Now, flip your big circle over and color the other side of it to "look" like Earth.

6. You now have a model of Earth's structure to help you learn which layer is where.

Activity for Advanced Students

Make a 3-D Model of Earth

Materials

- Modeling clay or play dough (recipe in Appendix E) in five different colors
- Dental floss
- Camera

Instructions

1. Using modeling clay or play dough, form a ball about 1 inch in diameter. This is the inner core.

2. For each of the remaining layers, you will use a different color. For each additional layer, roll out your color of choice to about 1/4 inch thick. You can roll out a circular shape or a square. The amount of play dough needed for each layer will increase as you work toward the outside of your "Earth."

3. Carefully mold the new color around the layers you already have. Take care not to mash it too tightly, as your colors will mix.

4. Continue adding layers until you have a color for each of the layers we have covered in this lesson.

Additional Notes

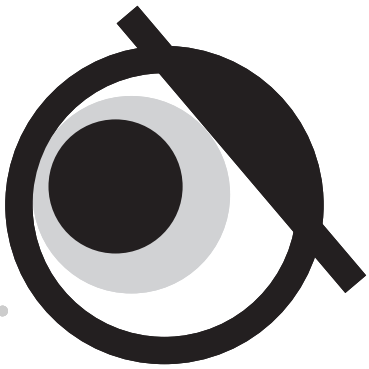
Additional Notes

5. Using dental floss, slice a wedge out of your "Earth" to reveal all the colors.

6. Make a diagram or key to go along with your model, listing the description of each layer.

7. Take a picture for your science notebook!

Unit One Wrap-Up



Now that you've completed the unit, it's time to wrap up all that you've learned and show what you know!

1. Copy this page and place a check mark in each box for work you've completed.
   - ❑ Lessons read
   - ❑ Daily Reading Sheets
   - ❑ Hands-On Time
   - ❑ Checking It Out forms
   - ❑ Vocabulary
   - ❑ Coloring Page

2. Now that you've accounted for the work up to this point, you should review all that you've studied. Here are some ways to do that.
   - ❑ Create a folderbook that covers the main ideas from each lesson. Instructions can be found in Appendix F.
   - ❑ Write a composition that reviews each lesson. See "Write About It!"—the composition worksheet and form in Appendix A.
     (Note: If your science notebook is complete and you've done a good job with your Daily Reading Sheets, it should be fairly easy to get the facts you need for these summaries.)

3. Show What You Know!—Complete the quiz on the next page to the best of your ability. After your teacher has reviewed your work, go back and use your book to answer anything you didn't know the first time through.

Show What You Know!

Answer as many questions as you can without using your book or notes. You get **10,000** points for each correct response. After going through the quiz once with your book closed, have your teacher review your work. Then, open your book and try again. You get **5,000** points for each additional correct answer. So, show what you know!

1. Name as many of the seven continents as you can.

_____

_____

_____

_____

_____

2. Name at least two oceans of the world.

_____

_____

_____

3. Earth moves in two different ways. It revolves, and it rotates. The word *revolve* means to: (circle one answer below)
   a. Move around an object.
   b. Spin.

4. Define the word *rotate*.

_____

_____

5. Approximately how far is Earth from the Sun? (circle one)
   a. 6,000 miles
   b. 2 million miles
   c. 93 million miles
   d. 200 miles

6. Label the parts of Earth's structure on a photocopy of the unlabeled "Structure of the Earth" diagram provided in Appendix A.

First Attempt _____
(number of correct responses X 10,000)

Second Attempt + _____
(number of correct responses X 5,000)

Total Number of Points = _____