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# Introduction

## ***How to use this book***

In this guide, each chapter is divided into two lessons. The first lesson includes objectives for the chapter, an assignment to be completed for the next day, glossary words, and review questions. The second lesson includes a list of materials needed for any experiments or activities, the *For You to Do* questions with answers, directions and answers for experiments and activities, and some Chapter Stretchers.

## ***Objectives***

These are the goals of each chapter. When your students have completed the chapter they should be able to do what the objectives state.

## ***Assignment***

In the first lesson of each chapter you will assign reading the chapter and answering the questions following the text. Decide how you will require your students to answer the questions. You may require them to use a spiral-bound (or similar) notebook to keep science assignments in. Do you want them to write questions and answers or only answers? Writing both questions and answers makes review from the notebook easier. If you allow (or require) science assignments on notebook paper, be sure students keep all their papers in a notebook or folder.

## ***Glossary***

The boldfaced words in the text are glossary words; an alphabetical listing of these words and their definitions is in the back of the textbook. To save your looking them up each day, a sequential list of these words is included in your lesson plans. Make use of these words. Part of the reading assignment with each chapter will include copying each glossary word into a notebook and copying the definition from the glossary. Some of these words have definitions in the text; insist that students copy the glossary definition. In oral review, they may use their own wording, but they all need to learn the same meaning initially—and it will be easier for you to grade.

## ***Review Questions***

You want to review previous chapters each day, but you cannot remember what you reviewed yesterday. Maybe you're asking the same questions over and over and missing some important concepts. Or you need a fresh way of asking the same question.

These are some reasons for using the review questions in the first lesson of each chapter. Add your own review questions in specific areas according to your class's needs.

## ***Materials Needed***

Check this list the day before you teach the lesson. It includes items for experiments, activities, and extra projects.

## ***For You to Do Questions and Answers***

You assigned the *For You to Do* questions in the first lesson. Go over them, with the answers, in the second lesson. Read the question and call on students for answers; discuss the answers. Require students to change any wrong answers. Grade neatness, thoroughness, and timeliness, but not answer content.

## ***Experiments and Activities***

Instructions and/or explanations for each experiment and activity are written in this guide. It may not be possible or necessary to do all of them. Decide which experiments and activities you will do in each chapter.

## ***Chapter Stretchers***

Use, alter, or ignore these ideas to fit your class needs. Some of the Chapter Stretchers are additional tidbits of facts that you will simply read to your class and possibly discuss. Other Chapter Stretchers are experiments or activities to help reinforce a concept. These ideas are more meat on the bones of the chapter. You may have time for some or all of the extra information; use it as you decide is best.

Material preceded by large quotation marks (“”) indicates material that you may read to the class. Other material is teacher explanation. Answers to questions are italicized.

A review lesson precedes each test. It includes a list of topics to review in preparation for the test and an alphabetical list of the glossary words to be reviewed.

An optional final test that covers material from the entire textbook. If you give this test to your class, you will need to spend several days reviewing all of the review lessons. You may also want students to review the 12 regular tests.



# Unit 1

“In the beginning God created the heaven and the earth.”

## Lesson 1

Have students page through their textbooks, looking at pictures and headings. If you have some favorite topics that this book covers, point them out to the class. Use this lesson to build enthusiasm for science this year.

Read Genesis 1 to the class or have each student read a verse or two.

“The title of this book is *God’s Marvelous Gifts*.

Genesis 1 tells how God created the world. The unit titles in this textbook come from this chapter.

We will learn about many of the wonderful, marvelous gifts that God created and gave to us. Read the names of the units and the chapters. What are some things you expect to learn about in each unit?

Unit 1 “In the beginning God created the heaven and the earth.”

Unit 2 “And God said, Let the earth bring forth grass...”

Unit 3 “And God said, Let there be lights in the firmament...”

Unit 4 “And God created...every living creature...”

Unit 5 “And God said, Let us make man...”

“In which unit would you expect to learn the parts of a plant? about elephants? about the number of bones in your body? about the stars?

“God has given us millions of wonderful gifts. He created a perfect world, full of perfect gifts. But sin entered the world, and because of sin, the earth is cursed. Now there is pain, disease, and death. In science this year, we will learn about the wonderful working of God’s marvelous gifts. We will also learn about some of the problems connected with those gifts as a result of the curse of sin.

## Chapter 1 God Gives Us Light

(pp. 4-6)

### Lesson 2

#### Objectives

To know when God created light and tell why light is important.

To tell the difference between natural and artificial light and give examples of each.

To define *transparent*, *translucent*, and *opaque*.

#### Assignment

Read Chapter 1, pages 4-6.

For You to Do

Copy glossary words and definitions.

#### Glossary

**natural light** – Light produced or made by nature.

**artificial light** – Light made by man-made objects.

**reflection** – The bouncing back of rays of light or heat.

**transparent** – Allowing light to pass through so that objects can be clearly seen.

**translucent** – Allowing light to pass through, but scattering the light so that objects cannot be seen clearly.

**opaque** – Not allowing light to pass through.

### Lesson 3

#### Materials needed

white paper  
tape  
clear drinking glass

water  
milk  
flashlight

#### For You to Do (p. 5)

Go over the answers to the questions.

1. There are many things you do after dark that you could not do without an artificial light.

## Lesson 4

Make a list of as many of these things as you can. *Examples: Go for a walk, read, travel, play games.*

2. Draw pictures of three sources of natural light. *Sun, moon, stars, fireflies, or anglerfish.*
3. Draw pictures of three sources of artificial light. *Pictures of lamps, candles, or any other artificial lights.*
4. What does the Hebrew word *day* mean? (Hebrew is the language in which the Old Testament was written.) *The Hebrew word day means "warmth and heat."*

### Chapter Stretchers

“Hebrew is the language that the Old Testament was written in. Many people living in Israel today speak Hebrew. It is a language much different from ours; it doesn’t use the alphabet that we use, and it is written “backward.” The first letter of a word is on the right instead of on the left. And the first page of a book is in the back. The Hebrew word for *day* is pronounced *yohm* (yōm).

Explain *transparent*, *translucent*, and *opaque*.

“Transparent materials allow light to pass through easily. These are materials such as glass and clear plastic. You can easily see through something that is transparent.

*Translucent* materials allow some light to pass through but scatter the light rays. Materials such as wax paper, other thin light-colored paper, thin plastics, and some thin fabrics, are translucent. You may be able to see shapes through a translucent material, but you can’t see clearly.

*Opaque* materials do not allow light to pass through at all. Cardboard, heavy or dark paper and plastic, wood, and leather are opaque. You cannot see through these materials at all.

“Have you ever seen a rainbow? When you see a rainbow, you are seeing light that has passed through a prism and broken into the different colors of light. Water droplets are the prism when you see a rainbow in the sky, but other objects act as prisms too. A specially-shaped piece of glass may be used as a prism to separate white light. What are the colors of the rainbow? *Red, orange, yellow, green, blue, indigo, violet.*

Discuss natural and artificial lights. Natural light is only that light which man has no control over, such

as light from the sun, stars, planets, fireflies, and anglerfish. Your students may consider fire a source of natural light, as it seems to be much more natural than electric lights. Explain to them that man has control over the light of a fire—he can start it and stop it.

Talk about how we use artificial lights when the sun goes down each night. If we had nothing but natural lighting, how would our lives be different? Have your students imagine life without artificial lights.

### Experiment (pp. 5, 6)

1. Optional. Students may do these activities at home.
2. Some objects are transparent, some are translucent, and some are opaque. To learn what these words mean, do these experiments.
  - Tack a white sheet of paper onto the wall. Hold a clear drinking glass 12 inches (30 cm) from the paper and shine a flashlight through the glass. The light passes through the glass easily because clear glass is transparent.
  - Fill the same glass with water and hold it in front of the paper. Shine the flashlight through the glass. The light passes through the water, but notice how the rays are scattered on the paper. The water in the glass is translucent. Water lets the light pass through but scatters it.
  - Fill the glass with milk and shine the flashlight onto it. Now you cannot see light pass through the glass. The milk in the glass is opaque. No light can pass through an opaque object.

## Chapter 2

(pp. 7-9)

## God Gives Us Night

### Lesson 4

#### Objectives

- To understand that we need dark as well as light.
- To learn the difference between a.m. and p.m.

#### Assignment

- Read Chapter 2, pages 7-9.
- For You to Do Activity

**Glossary**

There are no glossary words in this chapter.

**Review Questions**

- Are these lights natural or artificial?

candle – *artificial*

car headlights – *artificial*

firefly – *natural*

flashlight – *artificial*

stars – *natural*

sunshine – *natural*

campfire – *artificial*

moonshine – *natural*

- What does the Hebrew word for *day* mean?

*Warmth and heat.*

- Why do we use artificial lights? *So that we can see and work in the dark.*

- An object that lets light pass through easily is transparent.

- When an object bounces back the light, we say the light is reflected.

**Lesson 5****For You to Do (pp. 8, 9)**

1. When was the world all darkness? *Before God said, "Let there be light."*
2. How many hours are there in a night and a day? *24 hours.*
3. What does *a.m.* mean? *"Before noon."*
4. What does *p.m.* mean? *"After noon."*
5. Look at these pictures of daytime and nighttime. List some ways they are different.  
*Examples: In the daytime, the sun shines. A squirrel is out. At nighttime, the moon shines. An owl is out. The stars are out.*
6. When does our day begin? *At midnight.*
7. Why did God make a dark time? *So people can rest.*

**Activity (p. 9)**

1. Think about nighttime. What are some sounds you hear only during the night? *Examples: owls, whippoorwills, bullfrogs.*
2. What are some things you see only at night? *Examples: the moon, the stars, bats, some moths and insects.*
3. What are some things you may like to do that

you can do only at night? *Examples: look at the stars, watch a meteor shower, look for night animals.*

**Chapter Stretchers**

Read Genesis 1:16-18. "And God made two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also. And God set them in the firmament of the heaven to give light upon the earth, and to rule over the day and over the night, and to divide the light from the darkness: and God saw that it was good."

"In Chapter 20 you will study more about the lesser light that God created, and in Chapter 21 you will learn more about the stars. Right now you can learn about some other beautiful lights in the night sky: the northern lights.

People who live in northern countries often see the northern lights, sometimes called the *aurora borealis*, in the night sky. In displays of the northern lights, ribbons, curtains, or arches of colored lights dance in the sky. These lights may be any color of the rainbow and sometimes are bright enough to read by. When lights like this are seen near the South Pole, they are called the southern lights or *aurora australis*.

You may be wondering, "What are these spectacular light shows?" Scientists have learned that the northern and southern lights are caused when high-speed particles from the sun hit the earth's atmosphere. The particles are from *solar wind*, which is the name given to the flow of gases caused by sunspots on the sun. These particles react with the earth's atmosphere, resulting in colored lights. Because the earth's poles are like magnets that pull the solar winds toward themselves, the lights are usually seen in areas near the North and South Poles.

Maybe you will be outside some night and gasp in awe as a beautiful light show flickers across the sky. Then remember, "The heavens declare the glory of God."

"The earth is divided into 24 time zones. The

United States and Canada share six of these zones. In each time zone it is one hour earlier than in the time zone to the east and one hour later than in the zone to the west. For example, if your clock says 10 a.m. right now, people who live one time zone to the east will be reading 11 a.m. on their clocks. In the next time zone to the west, the clocks say 9 a.m. Remember that the sun always rises earlier in the east, so the sunset will be earlier in the east as well.



## Lessons 6, 7

“Look at the clock on the classroom wall or at your watch. What time is it? Is that a.m. or p.m.? If you didn’t have a clock to look at, how would you know what time it is? How do you suppose people kept track of time before they had clocks and watches?

Discuss how the following time measuring devices may have worked:

shadow clock	sundial
notched candles	water clock
hourglass	burning knotted rope

Mechanical clocks were first made in the 1300s. Of course they did not look like the clocks we use today; they were very large, but they did provide a more accurate way to keep track of time. As time went on, clocks became smaller until people could carry them in their pockets. In the 1600s pendulum clocks were built, and in the late 1800s, after electricity was discovered, electric-powered clocks were invented. Quartz clocks, battery-powered clocks, and atomic clocks are other modern clocks.

## Chapter 3 (pp. 10-13) God Gives Us the Firmament

### Lesson 6

#### Objectives

- To learn what the atmosphere is and how it is important.
- To tell about air pollution and what we can do about it.

#### Assignment

- Read Chapter 3, pages 10-13.
- For You to Do
- Activity
- Copy glossary words and definitions.

#### Glossary

- atmosphere** – The blanket of air, gases, and dust particles that surrounds the earth.
- pollution** – Dirt or impurity in water or air.

#### Review Questions

- How many hours are in one day and night? 24
- When is a.m.? *In the morning from midnight to noon.*
- What do we call an object that doesn’t let light pass through? *Opaque.*

- When is the time God made for resting? *Nighttime.*
- What is the firmament? *The sky.*

### Lesson 7

#### Materials needed

clear glass; 2 tablespoons soil; water

#### For You to Do (p. 12)

1. What is another name for the sky? *Firmament.*
2. What makes the sky blue? *The atmosphere scatters more blue light rays toward the earth.*
3. On a rainy day, why is the sky dark? *The sun cannot shine through the water-filled clouds.*
4. What is the atmosphere? *A blanket of air, gases, and dust particles surrounding the earth.*
5. What is air pollution? *Poisonous gases and dirt in the air.*
6. Name six things that can pollute the air. *Cars, buses, trucks, boats, airplanes, factories, and furnaces.*
7. How can you help keep the air clean?  
*Examples: Obey laws of the state that control air pollution; walk rather than drive when going a short distance.*

#### Activity (p. 12)

1. Name some things that live in the water and need air. *Fish, frogs, and water plants live in the water and need air.*
2. Name some things that live in the soil and need air. *Worms, moles, and some insects live in the soil and need air.*

#### Chapter Stretchers

“Air is a mixture of invisible gases. The two most important gases in the atmosphere are nitrogen and oxygen. The air in the atmosphere is 78% nitrogen, 21% oxygen, and almost 1% argon. The other part of a percent is made up by very small amounts of carbon dioxide, neon, helium, krypton, hydrogen, xenon, and ozone.

Many people with respiratory problems such as sinusitis, asthma, colds, and bronchitis suffer because of air pollution. It may be worse in some cities than in others, but air pollution is also found in country areas. Sometimes weather conditions don’t let the



polluted air rise, keeping the air pollution close to the ground. Population growth, increasing industry, more and more automobiles in use, and a growing use of pest-control sprays have led to the need to control air pollution. Cleaner fuel can be used to heat homes. Garbage can be buried instead of burned. Fewer paper products could be used. People can ride to work together in groups known as car pools. Can you think of a way to help today?

### Experiment (p. 13)

Use this experiment to show the presence of air in water and soil.

1. Fill a clear glass half full of water. Let it stand for 15 minutes.
  - a. What do you see in the water? *There are air bubbles in the water.*
  - b. What does this tell you? *There is air in water.*
2. Now put two tablespoons of soil in the glass of water.
  - a. What happens? *Many air bubbles rise to the top.*
  - b. What does this tell you? *The soil has air in it too.*

## Chapter 4 (pp. 14-16) God Gives Us Clouds

### Lesson 8

#### Objectives

- To learn how clouds are formed.
- To describe five kinds of clouds and the weather associated with each.

#### Assignment

- Read Chapter 4, pages 14-16.
- For You to Do
- Copy glossary words and definitions.

#### Glossary

- cumulus clouds** – White, fluffy, fair-weather clouds.
- cumulonimbus clouds** – Huge, towering cumulus clouds that bring thunder, lightning, and rain. Also called thunderheads.
- stratus clouds** – Low, flat, gray clouds that cover a wide area of the sky.

**cirrus clouds** –Thin, feathery, white clouds high in the air.

**nimbus clouds** — Dark, shapeless clouds that produce rain.

#### Review Questions

- What does *translucent* mean? *Light can pass through an object, but the light is scattered.*
- Why does the sky look blue on a clear day? *The atmosphere scatters more blue rays toward the earth.*
- How can governments help control air pollution? *By passing laws against burning and laws about how cars are made.*
- What is the atmosphere? *A blanket of air, gases, and dust particles surrounding the earth.*
- Name a source of artificial light. *Examples: fire, candle, or any electric light.*

### Lesson 9

#### Materials Needed

- |           |                  |
|-----------|------------------|
| teakettle | heat source      |
| water     | glass cup or jar |

#### For You to Do (p. 16)

1. God does not use the clouds for “watering cans” only. Read Psalm 104:3 and Nahum 1:3. What are the words that belong in these blanks? “Maketh the clouds his chariot.” “The clouds are the dust of his feet.”
2. What is a cloud made of? *Millions of tiny drops of water or ice crystals.*
3. Write a sentence using the word *predict*.  
*Example: Scientists can use clouds to help them predict the weather.*
4. What is the name of the cloud that forms highest in the sky? *Cirrus clouds.*

#### Chapter Stretchers

- “Look at the sky today. What kind of clouds do you see? What kind of weather do you think you will have today?”
- “1 Kings 17 and 18 record the story of Elijah when it did not rain for 3 years. In the third year, God told Elijah to show himself to Ahab and then God would send rain. After the contest on Mount Carmel,