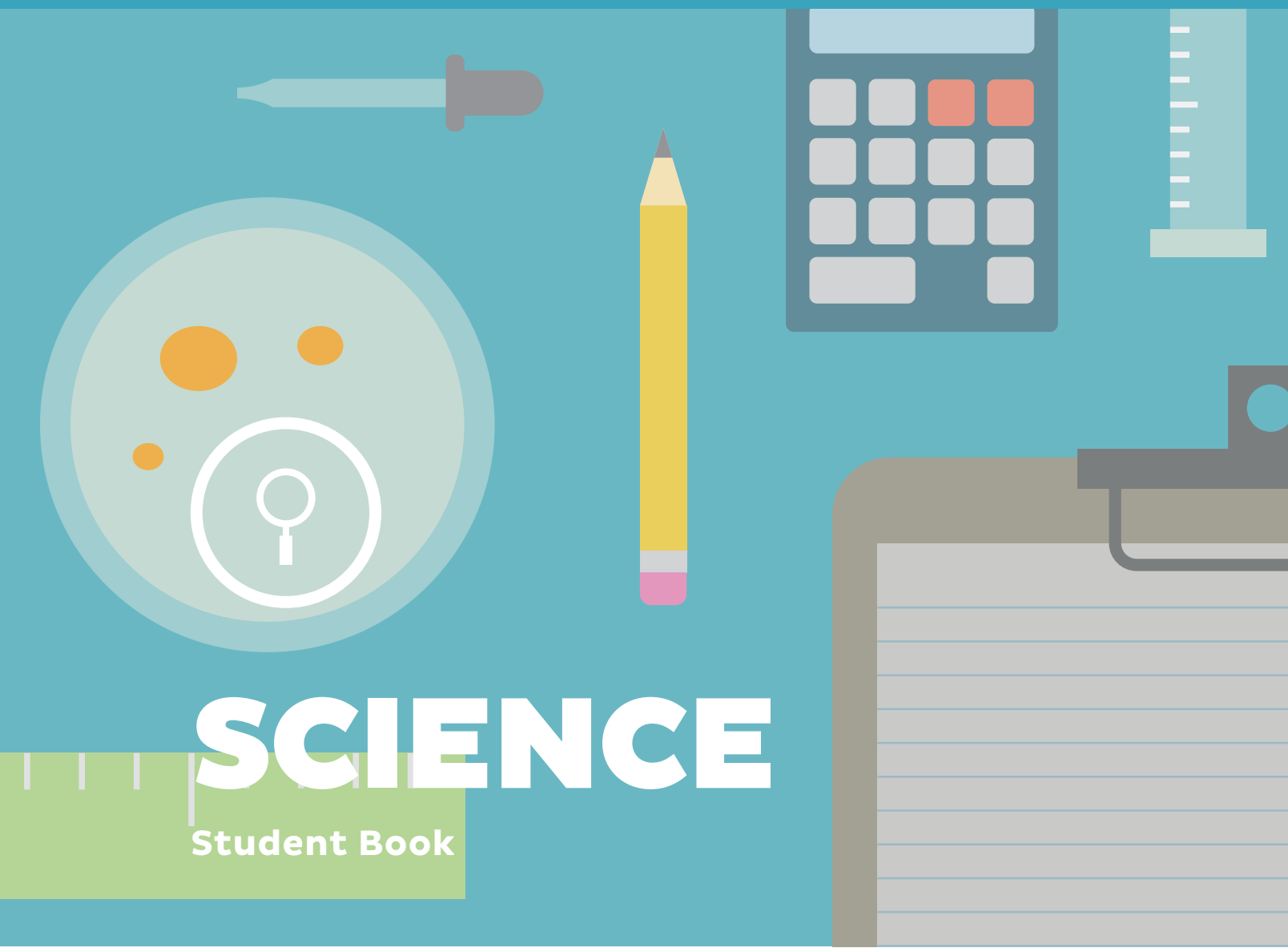
LIFEPAC®



SCIENCE

Student Book

5th Grade | Unit 7

Alpha Omega
PUBLICATIONS

SCIENCE 507
RECORDS IN ROCK: FOSSILS

Author:
Barry G. Burrus, M.Div, M.A., B.S.

Editor:
Brian Ring

Illustrations:
Brian Ring

Media Credits:
Page 3, 23: © Aneese, iStock, Thinkstock; **4, 15, 18, 32:** © Marcio Silva, iStock, Thinkstock; **6:** © DC Colombia, iStock, Thinkstock; **9:** © Russell Shively, iStock Thinkstock; **12, 32:** © fkienas, iStock, Thinkstock; **15, 32:** © apollob66, iStock, Thinkstock; **19:** © woodstock, iStock, Thinkstock; **20, 36:** © Aysunbk, iStock, Thinkstock; **24:** © artisticco, iStock, Thinkstock; **30:** © DaracSem, iStock, Thinkstock; **32:** © Snowshill, iStock,Thinkstock; © Pi-Lens, iStock, Thinkstock; **39:** © Tigatelu, iStock, Thinkstock; **42:** © EcoPic, iStock, Thinkstock; **43:** © Sasha Samardzija, iStock, Thinkstock; **44:** © alice-photo, iStock, Thinkstock; **45:** © mj0007, iStock, Thinkstock; **47:** © JaysonPhotography, iStock, Thinkstock; © aleks0649, iStock, Thinkstock; **48:** © matthew grove, iStock, Thinkstock.

Alpha Omega
PUBLICATIONS

804 N. 2nd Ave. E.
Rock Rapids, IA 51246-1759

RECORDS IN ROCK: FOSSILS

God created everything that exists. Fortunately, we have records preserved in rock and other materials of many of God's living things created long ago. These preserved records are called fossils. Fossils help us to learn about the types of living things that existed on the earth many thousands of years ago. As you learned in the previous LIFEPAC®, they are part of the physical record that God has given us in His creation.

In this LIFEPAC, you will learn much more about fossils. You will learn about the different types of fossils and where they may be found. You will also learn how fossils were formed long ago. Finally, you will learn what we can discover about times long ago by studying fossils.

Objectives

Read these objectives. These objectives tell what you should be able to do when you have completed this LIFEPAC. Each section will list according to the numbers below what objectives will be met in that section. When you have finished this LIFEPAC, you should be able to:

1. Identify different fossil types.
2. Explain where fossils may be found.
3. Describe fossil identification procedures.
4. Use fossil clues in making inferences.

1. FOSSIL FORMATION

Fossils are very interesting to find and study. They are the hardened remains of plants or animals that lived long ago. Fossils can also be an imprint of a once-living plant or animal. For example, some fossils are leaves, wood, shells, and skeletons of plants or animals that were buried during the time of the great Flood of Noah. Others are tracks left by moving animals of long ago.

You might be surprised to learn that fossils are very common and easy to find. They are plentiful in nearly every state in the United States. There are probably many fossils where you live. These fossils come in a great variety.

In this section of the LIFEPAC, you will learn about the different *types* of fossils. You will also learn about the location of some major fossil deposits around the world. You will also learn where fossils could be expected to be found in your local area.

Objectives

Review these objectives. When you have completed this section, you should be able to:

1. Identify different fossil types.
2. Explain where fossils may be found.

Vocabulary

Study these new words. Learning the meanings of these words is a good study habit and will improve your understanding of this LIFEPAC.

amber (am' bər). A hardened, yellowish material formed from the gum-like sap of cone-bearing trees.

carbonized (kär' bə nīzd). Changed into carbon.

cluster (klus' tər). A grouping together of things that are alike.

dissolved (di zolvd'). Became another form—usually liquid; faded away.

estimated (es' tə mā' təd). Made judgments or opinions; formed a good general answer by using data.

identified (ī den' tə fīd). Named something; decided what something was by comparing.

imprint (im' print). A mark pressed into a surface that was created by pressure.

mastodons (mas' tə donz). Huge, prehistoric animals that resembled elephants and are now extinct.

mineral (min' ər əl). A material gotten from the ground. It is not alive, but is a chemical.

mummification (mum' mə fə kā' shən). A process of forming fossils whereby animal or plant skin, tissue, or other parts are preserved by drying or the action of chemicals.

preserved (pri zėrvd'). Kept safe or protected.

prohibit (prō hib' it). To prevent from doing something.

sediment (sed' ə mənt). Material that settles to the bottom in liquid, such as dirt that has settled to the bottom of a river or lake.

similar (sim'ə lər). Somewhat alike.

shale (shāl). A type of fine-grained rock made from clay or mud.

sites (sīts). Places where something is located.

unearth (un ėrth'). To discover or dig up.

Note: *All vocabulary words in this LIFEPAC appear in* **boldface** *print the first time they are used. If you are unsure of the meaning when you are reading, study the definitions given.*

Pronunciation Key: h**a**t, **ā**ge, c**ă**re, f**ä**r; l**e**t, **ē**qual, t**ėr**m; **i**t, **ī**ce; h**o**t, **ō**pen, **ô**rder; **oi**l; **ou**t; c**u**p, p**ů**t, r**ü**le; **ch**ild; lo**ng**; **th**in; /ŦH/ for **th**en; /zh/ for mea**s**ure; /u/ or /ə/ represents /a/ in **a**bout, /e/ in tak**e**n, /i/ in penc**i**l, /o/ in lem**o**n, and /u/ in circ**u**s.

Types of Fossils

Millions of fossils have been found by people in modern times. Some of these fossils are plants. Some are fossils of animals. Even human fossils have been found. Some fossils are just imprints of plants or animals. There are so many varieties of fossils that it is useful to classify them.

There are several ways to classify fossils, but one of the most useful ways is to classify them by type. You will now learn about four types of fossils: *print fossils, original-remains fossils, petrified fossils, and carbonized fossils.*

Print fossils. *Print* fossils are the most common type. They are the prints or impressions of a plant or animal that lived long ago. The actual remains of the plant or animal are no longer present in the fossil. Only an impression of the remains has been left in the rock. These print fossils are further categorized as either (1) *mold* fossils or (2) *cast* fossils. Let's consider each of these two kinds of print fossils and how they were formed. As we discuss each of these kinds of fossils, you will get a chance to make your own models of them!

A *mold fossil* was formed when a living thing was covered with **sediment** and died. Later, the sediment hardened into rock. The plant or animal within the sediment decayed and **dissolved**. Because the plant or animal no longer existed, a hollow area in the hardened sediment remained. The actual plant or animal parts were no longer present. However, the outer shape or impression of the living thing was left in the sediment. Therefore, the fossil looks like a mold of the original plant or animal.

| A mold fossil is an impression of the object.

Most of the mold fossils that have been found are prints of shells, bones, or wood. Skin, leaves, and soft plant or animal parts are not usually found as mold fossils. This is because the pressure of the sediment may have destroyed the softer parts before they could make an impression. Also, bones, shells, and wood do not dissolve or decay as quickly as do soft or delicate living things.

In the experiment that follows, you will observe how a mold of an object can be made. This would be similar to the way mold fossils were formed.

EXPERIMENT 507.A MOLD FOSSIL COPY

View 507 Mold Fossil Copy: Grade 5 Science experiments video

You will examine what happens when a mold fossil is made. Your result will not be a real fossil. It will be a copy of a mold fossil.

These supplies are needed:

a small plastic container (about 10 centimeters across)
modeling clay
a seashell or bone

Follow these directions carefully. Check the box when each step is completed.

- ☐ **1.** Press the modeling clay into the bottom of the plastic container. The clay should be at least 1 centimeter thick.
- ☐ **2.** Smooth the surface of the clay.
- ☐ **3.** Carefully press the shell or bone into the clay. (If you use a shell, press the outside of the shell into the clay.)
- ☐ **4.** Lift the shell or bone out of the clay. You should have a clear imprint remaining in the clay.
- ☐ **5.** Keep your mold fossil copy from this experiment in a safe place to use in the next experiment.

Do this activity.

1.1 Draw a picture of your copy of the mold fossil.

Answer these questions.

1.2 How is your copy of a mold fossil like the shell or bone you used? _____

_____

_____

1.3 How is your copy of a mold fossil *different* from the shell or bone you used?

_____

_____

1.4 Why would this type of fossil be called a *print fossil*?

_____

_____

_____

Teacher check:

Initials _____ Date _____

You have learned that one form of a print fossil is a mold fossil. Another form of a print fossil is called a *cast fossil*. The cast fossil is made after a mold fossil has been formed. A cast fossil forms when ground water containing dissolved **minerals** and other fine particles drains though the rock and sediment and into the mold that has been formed by a decayed or dissolved plant or animal. The minerals and fine particles in the water are deposited inside the mold. When enough minerals and fine particles are deposited to fill up the mold, a copy—or *cast*—of the original plant or animal is made. With time, the casts can harden, and a *cast fossil* is made.

| A cast fossil is a copy of the original.

Like the mold fossil, the cast fossil is not actually made up of the remains of the ancient plant or animal. Instead, it is an imprint or cast of the original. However, it is a true copy of the original. It is part of the physical record that God has given us of ancient plants or animals that once lived upon the earth.

EXPERIMENT 507.B CAST FOSSIL COPY

View 507 Cast Fossil Copy: Grade 5 Science experiments video

You will examine what happens when a cast fossil is made. Since you must make your copy of a cast fossil in a short time, you will not use minerals from ground water. Instead, you will use some molding plaster to make your *cast*. Your result will not be a real fossil. It will be a copy of a cast fossil.

These supplies are needed:

the mold fossil copy from the previous experiment
molding plaster
a tin can and stick
a jar of water

Follow these directions carefully. Check the box when each step is completed.

- ☐ **1.** Prepare the molding plaster. Put some of the molding plaster into the can. Pour a small amount of water into the plaster. Stir the mixture with a stick. Add more water or plaster until the mixture is creamy, somewhat thick, and still liquid.
- ☐ **2.** Pour the molding plaster mixture into the clay copy of the mold fossil that you made in the last experiment until the mold is completely filled.
- ☐ **3.** Allow the molding plaster mixture in the mold to harden for at least an hour.
- ☐ **4.** Remove the hardened plaster from the clay mold. This hardened plaster is your copy of a cast fossil.

Do this activity.

1.5 Draw a picture of your copy of the cast fossil.

Teacher check:

Initials _____ Date _____

Answer these questions.

1.6 How is your copy of the cast fossil like the original seashell or bone that you used earlier? _____

_____

_____

1.7 How is your cast fossil copy different from the original shell or bone?

_____

_____

1.8 Why would this type of fossil be called a *cast fossil*? _____

_____

_____

_____

Teacher check:

Initials _____ Date _____

Original-remains fossils. The second type of fossil is called an original-remains fossil. Unlike the print fossils, the original plant or animal remains in an original-remains fossil did not decay or dissolve. Instead, an original-remains fossil contains the actual remains of the plant or animal. These plants and animals may have lived thousands of years ago.

An example of the original-remains fossil type is the mammoth found in Siberia. (You read about the mammoth and bison remains in Science LIFEPAC 506.) In that case, the actual remains of the mammoth were found in their completeness. The mammoth had not decayed at all. It had been protected from decay by the cold temperature of the permafrost in the Arctic region. This mammoth was one form of an original-remains fossil.

Original-remains fossils have been **preserved** in other ways, too. Some insects that lived long ago have been found perfectly preserved in **amber**, a hardened yellowish material from cone-bearing trees. These insects were completely formed and were not decayed at all. Their thin wings were protected unharmed. Their organs were not disturbed.

Another way that the original remains of ancient plants or animals have been preserved is by oil or coal deposits. Perfect remains of tiny fish and plants have been found in oil and coal deposits throughout the world. These remains were preserved by the presence of oil or coal around them. The pressure of the earth was not great enough to destroy the remains of the plants or animals. Therefore, they have become original-remains fossils.

| Insects preserved in amber

SELF TEST 1

Answer *true* or *false* (each answer, 2 points).

1.01 _____ A paved parking lot is a good place to look for fossils.

1.02 _____ A cast fossil is one kind of carbonized fossil.

1.03 _____ Ancient insects preserved in amber are original-remains fossils.

1.04 _____ A print fossil does not contain any of the original remains.

1.05 _____ Dinosaur track fossils were found in Massachusetts.

1.06 _____ Minerals in water helped to form petrified fossils.

1.07 _____ Carbonized fossils are usually found in areas where coal has been formed.

1.08 _____ Fossils are only found in a few places around the world.

1.09 _____ Tar pits in Los Angeles contained many varieties of plant and animal fossils.

1.010 _____ Petrified tusks, bones, and teeth were found in Alaska.

1.011 _____ In *replacement*, the minerals in water totally replace the original hard part of the plant or animal.

Match these items (each answer, 2 points).

1.012 _____ frozen mammoths

1.013 _____ mold fossil

1.014 _____ bones in caves

1.015 _____ found in coal

1.016 _____ permineralization

1.017 _____ tree rings can be seen

1.018 _____ most common fossils

1.019 _____ cast fossil

1.020 _____ preserved in amber

1.021 _____ skin stayed on some

a. print fossils
b. original-remains fossils
c. petrified fossils
d. carbonized fossils

Write the correct answer on each line (each answer, 3 points).

1.022 Frozen mammoths have been found in _____ .
a. Alaska b. Detroit c. Sicily

1.023 A large petrified wood deposit is found in _____ .
a. Siberia b. Arizona c. Maryland

1.024 Some fossils are the _____ shells.
a. chemicals in b. shape of c. life in

1.025 Petrified fossils are formed by minerals through _____ .
a. permineralization or replacement
b. replacement only
c. carbonization

1.026 In the Gobi Desert, dinosaur _____ were discovered.
a. eyes b. tongues c. eggs

1.027 Amber is hardened _____ material from cone-bearing trees.
a. gum-like b. bark-like c. needle-like

1.028 Animal and plant remains are fossilized with little or no change through a process known as _____ .
a. carbonization b. photosynthesis c. mummification

1.029 An important thing to consider for those who hunt fossils is _____ .

a. rain b. safety c. ease

Complete the following lists (each answer, 4 points).

1.030 List the four types of fossils.

a. _____

b. _____

c. _____

d. _____

1.031 List two kinds of fossil fuel.

a. _____

b. _____

Complete these items (each answer, 5 points).

1.032 Describe how a fossil might have been formed in sediment.

_____

_____

_____

_____

_____

_____

1.033 Explain how fossil hunters can be good stewards. _____

_____

_____

_____

_____

_____

_____

Teacher check: Initials _____

Score _____ Date _____

80/100

SCI_Gr3-5

Alpha Omega
PUBLICATIONS

804 N. 2nd Ave. E.
Rock Rapids, IA 51246-1759

800-622-3070
www.aop.com

SCI0507 – Jan '16 Printing

ISBN 978-1-58095-527-0