

SCIENCE

Student Book

▶ **5th Grade** | Unit 2

SCIENCE 502

PLANTS: LIFE CYCLES

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PLANTS: LIFE CYCLES

Plants are among the living things that God has created upon the earth. In the Book of Genesis, we read: “And God said, Let the earth bring forth grass, the herb yielding seed, and the fruit tree yielding fruit after his kind, whose seed is in itself, upon the earth: and it was so. And the earth brought forth grass, and herb yielding seed after his kind, and the tree yielding fruit, whose seed was in itself, after his kind: and God saw that it was good.” (Genesis 1:11-12). All of these living things are the part of God’s creation called plants.

In this LIFEPAC® you will learn about various kinds of plants, fungi, and protists. Fungi and protists have some similarity to plants, but they are also different. You will examine aspects of the life cycles of these living things. You will learn about some differences among plants, fungi, and protists. You will also learn about their common structures of and the ways they reproduce. Finally, you will have an opportunity to observe some of these living things close-up during experiments!

Objectives

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

1. Classify all living things into one of five kingdoms.
2. Identify the main kinds and parts of plants.
3. Describe the life cycles of plants, fungi, and some protists.
4. Identify the main reproductive parts of seed-bearing and spore-bearing organisms.
5. Classify plants, fungi, and protists you observe.
6. Explain differences between the main categories of plants, fungi, and protists.
7. Relate the structure of plants, fungi, and protists with their reproduction in a life cycle.



1. CLASSIFYING LIVING THINGS AND PLANTS

God has created a great variety of living things on the earth. God has placed these living things throughout the earth in all regions and environments. Many scientists today classify all living things into five main groups. These five groups are sometimes called *kingdoms*. The five kingdoms of living things are (1) animals, (2) plants, (3) **fungi**, (4) **protists**, and (5) **monerans**.

These living things are classified within one of these five kingdoms because they share certain basic characteristics. There are several characteristics that scientists consider when classifying living things. Some of these basic characteristics include the physical structure and make-up, the means of obtaining food, and the means of reproduction. For example, protists and monerans are simple, tiny organisms made up of one cell or only a few types of cells, while plants and animals are complex organisms made up of many types of cells. Fungi can be simple, one-celled organisms, or they may be more complex. But all fungi are organisms that lack chlorophyll, the green coloring that many plants use to make food and oxygen. Therefore, fungi must obtain their food from outside sources. Table 1 shows some characteristics and examples of living things within each of the five kingdoms.

Objectives

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

1. Classify all living things into one of five kingdoms.
2. Identify the main kinds and parts of plants.
3. Describe the life cycles of plants, fungi, and some protists.
4. Explain differences between the main categories of plants, fungi, and protists.

Vocabulary

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

adulthood (ə dult' hüd). The time of life when an organism is grown up enough to reproduce.

algae (al' jē). A group of water plants. Some have many cells. Others have one cell.

botany (bot' n ē) The study of plants.

fungi (fun' jī). One of the five main kingdoms of living things. They do not produce chlorophyll.

monerans (mo ner' uns). Very tiny and simple organisms that are one of the five main kingdoms of living things.

protists (prō' tists). One of the five main categories of living things. They are tiny organisms.

spores (spôrz). Spores are tiny, specialized structures that are able to grow into a new organism. Spores help an organism survive and move from place to place.

vegetative (vej' ə tã' tiv). The parts of a flowering plant that include the roots, stems, and leaves. It is also another form of reproduction of some plants.

yeast (yēst). A single-celled fungi.

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: hat, āge, cāre, fār; let, ēqual, tērm; it, īce; hot, ōpen, ôrder; oil; out; cup, pūt, rüle; child; long; thin; /FH/ for then; /zh/ for measure; /u/ or /ə/ represents /a/ in about, /e/ in taken, /i/ in pencil, /o/ in lemon, and /u/ in circus.

KINGDOM	CELL TYPE	FOOD	EXAMPLES
Animals	multicellular	obtain from outside sources	worms, insects, birds, fish, mammals
Plants	multicellular	produce their own	moss, trees, flowering plants
Fungi	unicellular or multicellular	obtain from outside sources	mushrooms, yeast , mold
Protists	unicellular or multicellular	produce their own and obtains from outside sources	prorozoa, paramecium, green algae , red algae
Monerans	unicellular or multicellular	engulfed from outside sources	bacteria, blue-green algae

Table 1 | Classifying Living Things

In this LIFEPAC, we will examine some similarities and differences among various types of plants, fungi, protists, and monerans. We will especially focus on plants. In the next LIFEPAC, we will focus on animals.

In this section of the LIFEPAC, we will explore the kinds of plants, the structure of plants, and explain what is meant by the *life cycle* of living things.



Write the answers on the lines.

- 1.1** _____ has created a great variety of living things.
- 1.2** Scientists classify all living things into five _____.
- 1.3** The five _____ of all living things are:
- a. _____ b. _____
- c. _____ d. _____
- e. _____



Answer these questions.

1.4

What are some of the basic characteristics that scientists consider when classifying living things? _____

1.5

How do fungi differ from green plants? _____

1.6

What are two examples in each of the five kingdoms of living things? _____

Kinds of Plants

Plants are very important to us. Plants furnish people with the oxygen we breathe. The food we eat comes from plants or animals that eat plants. Plants also supply us with clothing from the fibers of plants such as cotton. Much of our shelter comes from plants, such as the lumber from trees used in building our homes. God has given us plants to support our life on earth.

Plants are one of the most common of the living things that you see every day. Grass, trees, flowers, and shrubs are some of the types of plants that are around you. There are probably over 260,000 kinds of plants on the earth! They vary greatly in size. Some plants that grow on forest floors are so tiny that they can barely be seen. Others, such as the giant sequoia trees growing in California are among the largest of all living things. These trees can grow to over 290 feet high and measure over 30 feet wide!

The study of plants is called **botany**, and the people who study plants are called botanists. Botanists classify plants into five basic groups. You will learn more about two of these plant groups in this LIFE PAC. One of these groups is seed-bearing plants. You will learn more about seed-bearing plants in Section 2 of this LIFE PAC. Ferns are another important group of plants. You will learn more about ferns in Section 3 of this LIFE PAC.



| Giant Sequoia tree



Activity 502.A Observing Plants

1.7

Go outside to your yard or to a park and observe the different kinds of plants that you see. Make a list of as many types of plants as you can identify and share this list with your teacher.



Teacher check:

Initials _____ Date _____

Parts of Plants

All living things, including plants, are made up of cells. All plants are multicellular; that is, they have many cells. The cells are organized in each plant to perform different functions. Each group of cells with a similar function is called a *tissue*. Plants have several types of tissues. As you learned in a previous LIFE PAC on cells, there are four main types of plant tissues: (1) epidermal, (2) connective, (3) storage, and (4) support. The epidermal tissues provide plant cover in the leaves as well as the roots. The connective tissues help the water, gases, and food compounds to travel to various parts of the plant. Storage tissues are contained in the leaves to store fat-type materials for the plant. Some plants, such as beets, carrots, radishes, and sweet

potatoes, also have storage tissues in the roots to help store food for the plant. Finally, the support tissues help support the plant and keep it stable.

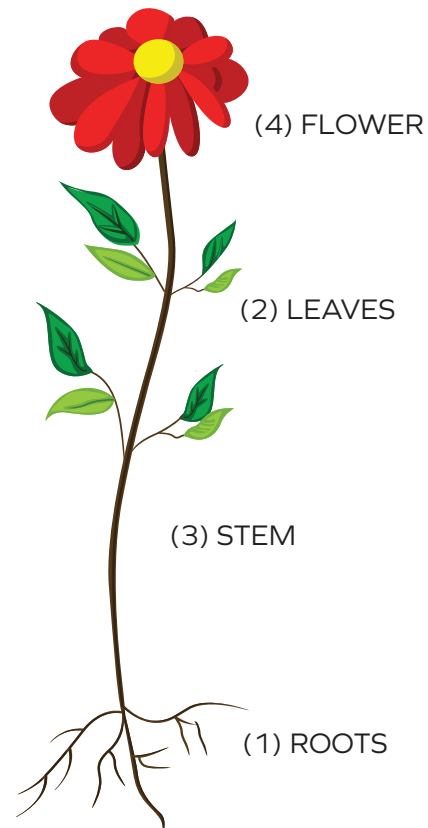
Plants also have different *parts*. Flowering plants, the most common type of plants, have four main parts: (1) roots, (2) leaves, (3) stems, and (4) flowers. The roots, stems, and leaves are called the **vegetative** parts of a plant. The flowers, fruits, and seeds are known as the reproductive parts of the plant. We will learn more about the reproductive parts of flowering plants in Section 2 of this LIFE PAC.

Life Cycles

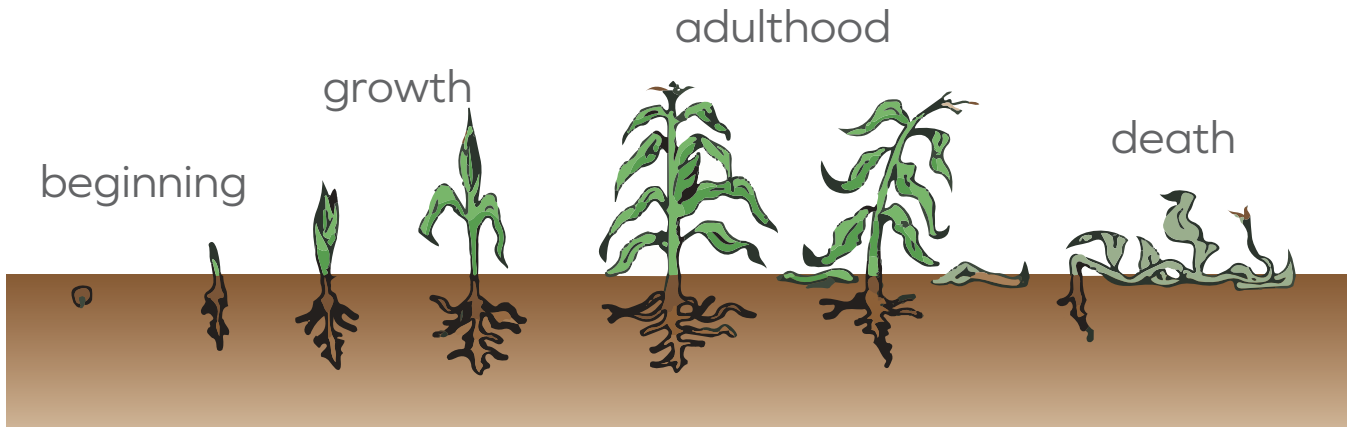
All living things go through *life stages*. For example, they all have a beginning life stage and an ending life stage. Most living things also have a growth stage and a stage for **adulthood**. All of these stages for a living thing are called a *life cycle*. Similarity in life cycles

is also one way we can classify or categorize living things. Many types of plants have similar life cycles. Some plants also have a similar life cycle to types of fungi and protists. Therefore, in this LIFE PAC, we will focus on similarities in life cycles among various types of plants, fungi, and protists.

The stages of life are important in the life cycle of any living thing. For example, consider the life cycle of a typical corn plant. The four stages of the life cycle of a corn plant are (1) beginning, (2) growth, (3) adulthood, and (4) death — or end. The beginning stage of a corn plant starts when a new seed is made. After the seed is planted and receives proper nourishment of water and minerals, it enters the growth stage. The seed begins to develop into a mature plant. The mature plant occurs when the plant reaches adulthood and begins to produce ears of corn and many new seeds. Finally, the last stage is when the corn plant comes to an end and dies. These four stages in the lifetime of a corn plant are the life cycle of the corn plant.



**The Four Parts
of a
Flowering Plant**



| Life cycle of a corn plant

In the remaining sections of this LIFE PAC, we will explore the similar life cycles of 3 categories of living things: (1) seed-bearing plants, (2) **spore**-bearing plants and fungi, and one-celled fungi and protists.



Answer true or false.

- 1.8** _____ Plants furnish people with oxygen.
- 1.9** _____ Plants do not vary greatly in size.
- 1.10** _____ Plants are both unicellular and multicellular.
- 1.11** _____ Cells that perform similar functions in a plant are called tissue.
- 1.12** _____ The roots, stems, and leaves of flowering plants are called the vegetative parts.
- 1.13** _____ All living things have a life cycle.
- 1.14** _____ The last life stage of a corn plant occurs when the seed begins to grow.



Answer these questions.

1.15 What are the four types of tissues in a plant?

- a. _____
- b. _____
- c. _____
- d. _____

1.16 What are the four main parts of flowering plants?

- a. _____
- b. _____
- c. _____
- d. _____

1.17 What are the four life stages of a corn plant?

- a. _____
- b. _____
- c. _____
- d. _____



Review the material in this section to prepare for the Self Test. The Self Test will check your understanding of this section. Any items you miss on this test will show you what areas you will need to restudy in order to prepare for the unit test.

SELF TEST 1

Match these items (each answer, 2 points).

- | | | | |
|-------|--------------------------|----|--|
| 1.01 | _____ animals | a. | the study of plants |
| 1.02 | _____ plants | b. | flowers, fruits, and seeds |
| 1.03 | _____ fungi | c. | roots, stems, and leaves |
| 1.04 | _____ protists | d. | provides plant cover on leaves and roots |
| 1.05 | _____ monerans | e. | storage tissue |
| 1.06 | _____ kingdoms | f. | over 290 feet high |
| 1.07 | _____ botany | g. | five main groups of all living things |
| 1.08 | _____ reproductive parts | h. | bacteria, blue-green algae |
| 1.09 | _____ vegetative parts | i. | protozoa, red algae |
| 1.010 | _____ epidermis | j. | yeast, molds |
| | | k. | moss, trees |
| | | l. | insects, birds |

Complete these statements (each answer, 4 points).

- 1.011 _____ has created a great variety of living things.
- 1.012 Some of the basic characteristics of all living things include the physical structure and make-up, the means of obtaining _____, and the means of reproduction.
- 1.013 Fungi can be unicellular or _____.
- 1.014 There are probably over _____ kinds of plants on earth.
- 1.015 All living things go through _____ stages.

Complete the life stages of a corn plant in the proper order (each answer, 5 points).

- 1.016 _____
- 1.017 _____
- 1.018 _____
- 1.019 _____

Write the correct letter and answer on the blank (each answer, 4 points).

- 1.020** All fungi lack _____ .
a. roots b. stems c. chlorophyll
- 1.021** People who study plants are called _____ .
a. botanists b. chemists c. physicians
- 1.022** A mature corn plant occurs when the plant reaches _____ .
a. five feet b. old age c. adulthood
- 1.023** The total number of life stages for a living thing is called a _____ .
a. growth period b. life cycle c. tissue
- 1.024** Some plants have a similar life cycle to _____ .
a. fungi b. protists c. both a and b

Answer this question (each answer, 5 points).

- 1.025** What are the four main parts of a flowering plant?
- a. _____
- b. _____
- c. _____
- d. _____

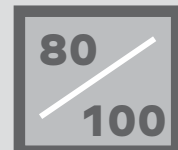


Teacher check:

Score _____

Initials _____

Date _____





SCI_Gr3-5



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800-622-3070
www.aop.com

SCI0502 – Jan '16 Printing

ISBN 978-1-58095-522-5



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