

SCIENCE

Student Book

▶ **5th Grade** | Unit 10

SCIENCE 510

LOOK AHEAD

Introduction	3
1. Living Things	5
The Life of Plants, Fungi, Protists, and Monerans	7
Life of Animals and Animal-Like Protists	14
Balance of Nature	24
Human Impact on the Balance of Nature	27
Self Test 1	29
2. The Earth	32
Records of Life	33
Records in Rock	40
Self Test 2	48
3. Order in Creation	51
Energy	52
Matter	57
Self Test 3	62
LIFEPAC Test	Pull-out

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LOOK AHEAD

One of the best ways to prepare for what is ahead is to have a good knowledge of what you have covered. This LIFEPAC® is something like that. You will review much of the material that you have covered in the previous nine science LIFEPACs of this series. You will cover many of the same ideas in this LIFEPAC, but they will be presented somewhat differently. The previous topics will be related in new ways in this LIFEPAC. This LIFEPAC will give an *overview* of the topics previously covered in order to help you “look ahead” as you learn more about God’s wonderful creation in the future.

This LIFEPAC can also help you to consider ways to use your information wisely. By knowing more about science, you can make better decisions on how to be a good steward of the world as God created it and meant it to be.

You will not have new vocabulary in this LIFEPAC. Instead, you will review the vocabulary presented in some of the previous nine LIFEPACs. You will do several creative activities, and you will continue to use the Bible. Some questions may not have the answers given in the text of this LIFEPAC. You may need to refresh your memory by returning to earlier LIFEPACs. By covering the material in this LIFEPAC in a new way, you will be strengthened in your new science knowledge and better able to “look ahead” to the future.

Objectives

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

1. Describe types of plants and animals.
2. Explain the relationship of cells to living things.
3. Describe the balance of nature.
4. Explain geological records.
5. Compare physical records and Biblical records of the earth's past.
6. Identify types of energy and work.
7. Tell about the order in matter, its structure, properties, and changes.



1. LIVING THINGS

God has created a rich variety of living things on the earth. Scientists today classify all living things into five *kingdoms*: (animals, plants, fungi, protists, and monerans). Examples of living things in each of these five kingdoms is given in Table 1. These living things are all around us: on the land, under the ground, in the water, and in the air. All living things are made of the basic unit of living things: a cell. Some living things consist of only one cell and are called *unicellular* organisms. Other living things consist of many cells and are called *multicellular*. All living things go through life cycles: they are born, reproduce, and die.

The cells of all living things have some similar parts. Every cell has a cell membrane and protoplasm (or cytoplasm) within the membrane. Some cells contain only these two parts and are called *prokaryote* cells. Bacteria, which are monerans, are an example of living things that contain only prokaryote cells. Many other cells contain three basic parts. These cells contain a cell membrane, cytoplasm, and a nucleus. These 3-part cells are called *eukaryote* cells. Unicellular organisms can be either prokaryote cells or eukaryote cells. All multicellular living things consist of eukaryote cells.

In this section of the LIFEPAC, you will examine the relationship of cells to living things, especially plants and animals. You will also review various types of plants, animals, fungi, protists, and monerans. Finally, you will learn more about the natural and human influences that impact the balance of nature.

Objectives

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

1. Describe types of plants and animals.
2. Explain the relationship of cells to living things.
3. Describe the balance of nature.

TABLE 1. CLASSIFYING LIVING THINGS

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

The Life of Plants, Fungi, Protists, and Monerans

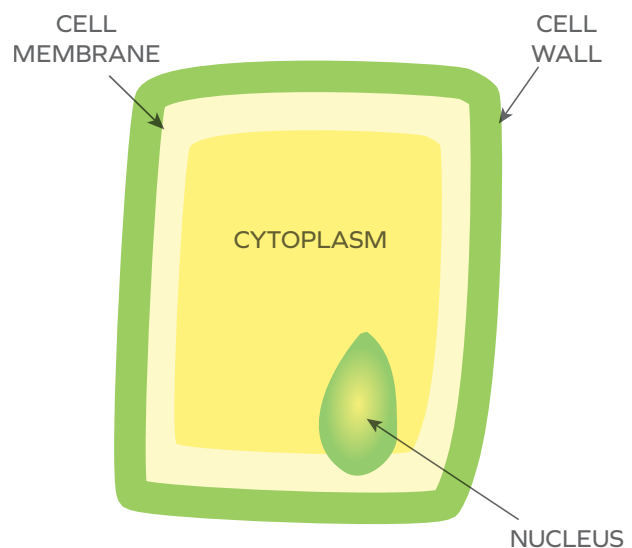
The cells of all living things are alike in some ways. For example, all cells have cell membranes and protoplasm. Yet, there are also important differences among living things of the five kingdoms. These differences among cells cause living things of one kingdom to function somewhat differently from those of another kingdom. Even within the same kingdom of living things, differences in the structures of cells cause the living things to function differently. Let's now look at some common and some different features of the cells of plants, fungi, protists, and monerans. We will especially examine some important differences among plants.

Cells. In most plant and fungi cells, there is a fourth part of the cell: the *cell wall*. Cell walls surround the cell membrane. Cellulose in the cell walls helps to make the plants and fungi more rigid. Plants and fungi need rigid cell walls in order to stand and keep shape. Otherwise, they would be lying on the ground. By having cell walls, plants and fungi do not need skeletons or hard shells.

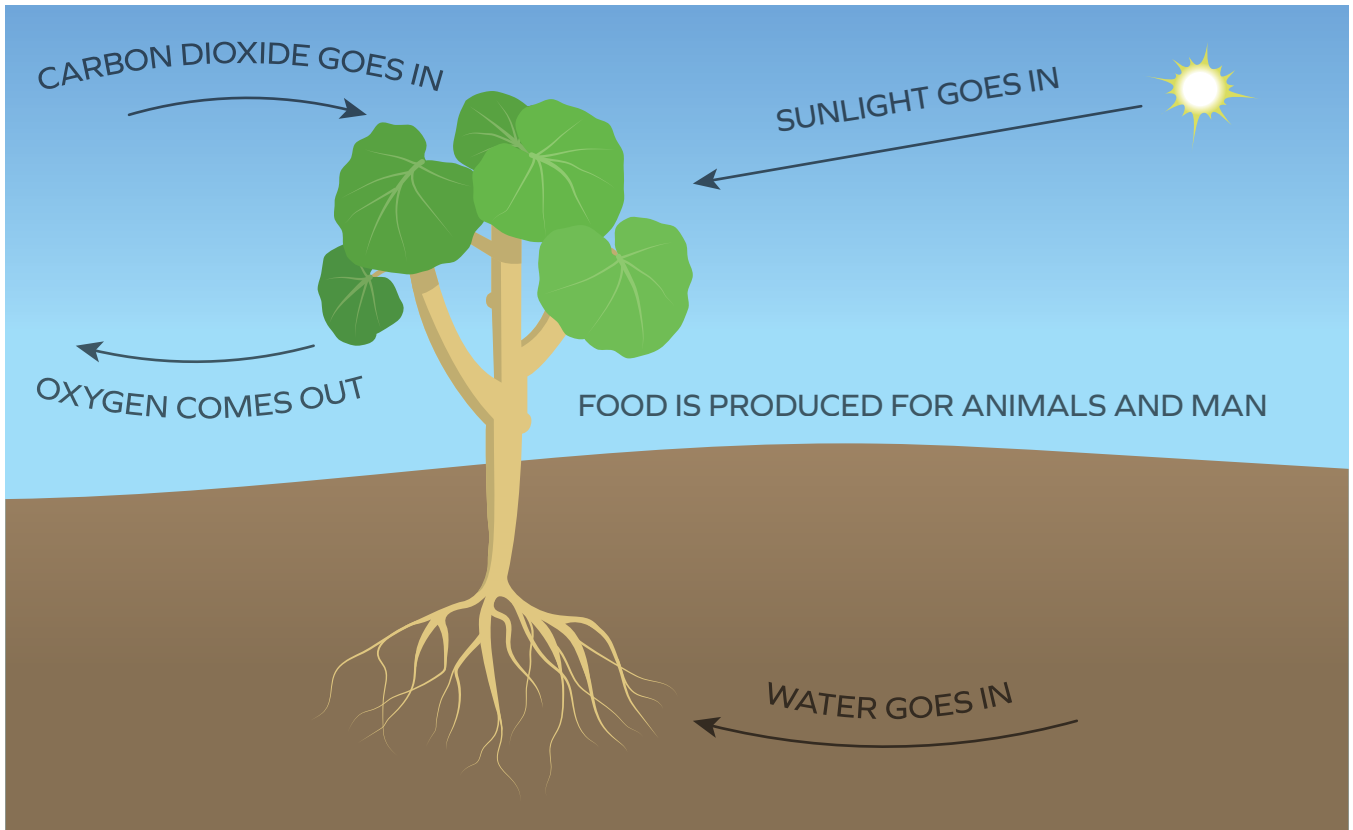
Plant cells, along with the cells of some protists and monerans, contain *chloroplasts*. These chloroplasts are some of the tiny parts of a cell within the cytoplasm called *organelles*. The chloroplasts contain *chlorophyll*—a green pigment. Chlorophyll absorbs energy from the sun. Fungi do not have chloroplasts nor chlorophyll. Only plants and some protists and monerans (like green algae) contain chlorophyll. The chlorophyll is what gives plants their green color.

When sunlight shines on the chlorophyll within living things, *photosynthesis* takes place. In photosynthesis, the energy from the sun is used by the chlorophyll to combine carbon dioxide and water in the plant. This process forms oxygen and sugars that are used within the plant for food. The oxygen is released from the plant to the atmosphere as a product of photosynthesis. The oxygen released from the plants is used by other living things, mainly animals and human beings, in order to breathe.

As part of God's plan for living things, only plants and some protists and monerans go through the process of photosynthesis. They receive energy directly from the sun and store this energy in their cells during photosynthesis and the production of "food" and oxygen. Other living things, like animals and fungi, cannot receive their energy directly from the sun. They must use the energy stored in plants or some protists and monerans for food in order to receive energy.



| Plant and fungi have a cell wall surrounding the cell membrane.



| The process of photosynthesis

Cells in plants or fungi that perform a similar function are called *tissue*. Plants and fungi have epidermal, connective, storage, and supportive tissues. Connective tissues carry needed materials through the plant or fungus. Storage tissues store food.



Write the correct letter and answer in the blank.

- 1.1** Some living things consist of only one cell and are called _____ organisms.
 a. multicellular b. unicellular c. regular
- 1.2** Three-part cells are called _____ cells.
 a. prokaryote b. eukaryote c. complex
- 1.3** In most plant and fungus cells, there is a fourth part of the cell called the _____.
 a. protoplasm b. cavity c. cell wall

- 1.4** The chloroplasts within a cell contain _____, a green pigment.
- a. proteins b. chlorophyll c. oxygen
- 1.5** In _____, the energy from the sun is used by the chlorophyll to combine carbon dioxide and water in the plant.
- a. photosynthesis b. hydration c. oxidation



Complete this list.

- 1.6** List the five kingdoms of all living things.
- a. _____ b. _____
- c. _____ d. _____
- e. _____



Do this activity. In the first two LIFEPAcs of this series—Science 501 and Science 502—you learned many new vocabulary words. Some of these vocabulary words are listed below; however, the letters in these words are scrambled within the little “cells” below. Unscramble the vocabulary words and write them correctly within the cell. Note that the first letter of each correctly spelled word is in bold print. After you have written the word correctly, write the definition on the lines following the cell.

1.7



1.8



1.9



1.10



1.11



1.12



1.13



1.14



Types of plants, fungi, protists, and monerans. Each living organism must reproduce if its species is to survive. Its method of reproduction helps determine its *classification* among the kingdoms of living things. For example, some plants are seed-bearing, and other plants are cone-bearing. Each plant type includes many varieties of plants. These plants often look very different. They have different parts, and their life cycles may vary greatly.

Seed-bearing plants reproduce by means of a seed. The seed is formed only after an egg from the plant has been fertilized by sperm. The fertilized egg grows into an embryo through *mitosis*, a process in which the cells of the organism grow, split, and divide. A seed coat is formed around the embryo.

In a flowering plant, the seed is surrounded by the flower's ovary. The ovary becomes fruit. In a cone-bearing plant, the seed grows inside the



| An avocado is a seed-bearing plant.

female cone. The cone functions much like fruit, but it is not considered a fruit.

The seeds of both flowering and cone-bearing plants begin to grow when they fall to the ground and are covered by soil. Warmth and water help the new plants to mature. The life cycle continues as these plants mature into adults and produce new seeds.

Spore-bearing plants do not produce seeds. They reproduce by means of spores. Ferns are an example of plants that reproduce by spores. Spores of fern plants do not grow into adult plants. They grow into tiny green plants through mitosis. Then, the egg cells and sperm cells are formed. After fertilization, embryos begin to develop. These embryos grow into adult ferns.

Many types of fungi also reproduce by spores. The spores in fungi function somewhat differently than they do in plants. Spores are released into the air by the parent fungus. When they settle onto something warm and damp, they begin to grow. They grow into adult fungi through mitosis.

Many one-celled organisms reproduce by giving up part of themselves. The parent organism divides into two new cells. Each new organism cell can perform all the functions needed to survive. Algae, which may be either protists or monerans, divide through mitosis. The algae cell grows and reproduces in a short time. Yeast, a type of fungus, reproduces through budding. Colonies of yeast cells may be connected, but each yeast cell is a separate organism. Reproduction of yeast happens very fast in warm, damp conditions.



| Certain pine trees are cone-bearing plants.



| Different Types of Algae



1.15

Draw a diagram.

In this space, draw a diagram of a flowering plant. Label the parts. Use arrows to show what happens during reproduction. (You may need to use the Science 502 LIFE PAC for review.)

A large, empty rectangular box with a thin green border, intended for the student to draw a diagram of a flowering plant and its reproduction process.



Match these items.

- | | | |
|-------------|-----------------------------|----------------------------|
| 1.16 | _____ sperm | a. male part |
| 1.17 | _____ stamen | b. female part |
| 1.18 | _____ mitosis | c. neither male nor female |
| 1.19 | _____ sac | |
| 1.20 | _____ cone near top of tree | |
| 1.21 | _____ ovary | |
| 1.22 | _____ seed | |
| 1.23 | _____ hyphae | |
| 1.24 | _____ anther | |
| 1.25 | _____ pistil | |
| 1.26 | _____ egg cell | |
| 1.27 | _____ fruit | |
| 1.28 | _____ larger cone | |
| 1.29 | _____ stigma | |
| 1.30 | _____ pollen | |

SELF TEST 1

Match these items (each answer, 3 points).

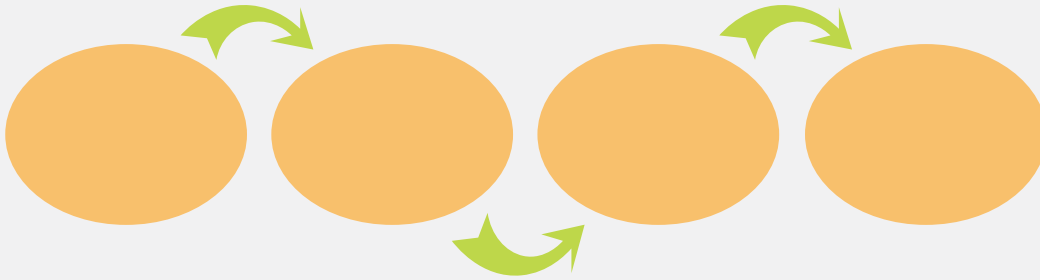
- | | | |
|-------------|------------------------|----------------------------|
| 1.01 | _____ bacteria | a. moneran |
| 1.02 | _____ mammal | b. animal-like protist |
| 1.03 | _____ insect | c. seed-bearing plant |
| 1.04 | _____ flowering | d. fungi |
| 1.05 | _____ blue-green algae | e. egg-laying invertebrate |
| 1.06 | _____ amoeba | f. egg-laying vertebrate |
| 1.07 | _____ reptile | g. live-bearing vertebrate |
| 1.08 | _____ fruit | |
| 1.09 | _____ yeast | |
| 1.10 | _____ cone-bearing | |

Write the correct letter and answer on the blank (each answer, 5 points).

- 1.011** All living things may be classified into _____ .
 a. five kingdoms b. plants or animals c. mammals
- 1.012** A(n) _____ organism has many cells.
 a. unicellular b. multicellular c. moneran
- 1.013** In _____ , the energy from the sun is used by the chlorophyll in a green plant to combine carbon dioxide and water.
 a. osmosis b. photosynthesis c. migration
- 1.014** Only mammals have _____ .
 a. wings b. shells c. hair

Label this diagram (this question, 10 points).

- 1.015** Use these words to label the diagram of a food chain: primary consumer, decomposer, secondary consumer, producer.



Write true or false (each answer, 3 points).

- 1.016** _____ Flowering plants produce seeds for reproduction.
- 1.017** _____ Prokaryote cells have three basic parts.
- 1.018** _____ Fish care for and nourish their young after birth.
- 1.019** _____ Animal cells contain chloroplasts.
- 1.020** _____ Mollusks are a type of fish.
- 1.021** _____ Only plants and fungi have cell walls.
- 1.022** _____ The balance of nature depends upon the water cycle.
- 1.023** _____ Birds are the only animals that have feathers.
- 1.024** _____ Humans cannot affect the balance of nature.
- 1.025** _____ Riding a bicycle instead of taking a car can show good stewardship.

Complete these activities (each answer, 5 points).

1.026 Explain how the carbon cycle is important to the balance of nature.

1.027 Why is mitosis important to plants and animals? _____

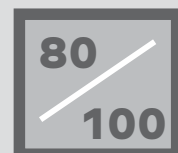


Teacher check:

Score _____

Initials _____

Date _____





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