LIFEPAC®

SCIENCE

STUDENT BOOK

10th Grade | Unit 9

Alpha Omega
PUBLICATIONS

SCIENCE 1009
Ecology and Energy

LIFEPAC Test is located in the center of the booklet. Please remove before starting the unit.

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Ecology and Energy

Introduction

All sciences are part of ecology. Wherever you go on our planet Earth, you can study ecology. Ecology is a science of relationships. Plants, animals, and people depend on each other and the environment for survival. Ecology is part of God's plan for human survival on earth.

Pollution is a problem facing many places in the world. Understanding more about ecology helps people to prevent and solve pollution problems.

The way people use energy has caused many pollution problems, but energy may also help solve many pollution problems. Understanding more about ecology helps people to understand the need for making wiser choices in energy sources and uses. How individuals choose to use energy can hurt or help the air, land, water, and life on earth.

God wants us to enjoy the world He gave us. He wants us to look at, study, and learn from living things around us. We are to solve the problems we can and trust Him for the problems we cannot solve. God wants us to take care of the earth that was created to supply our everyday physical needs.

Objectives

Read these objectives. The objectives tell you what you will be able to do when you have successfully 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. Define ecology.
2. Discuss how ecological relationships affect the environments of our world.
3. Relate principles of ecology to specific concepts.
4. Discuss the parts of an ecosystem.
5. List reasons why plants and animals live in certain environments.
6. Define the balance of nature.
7. List examples of good management principles for taking care of environmental resources.
8. Describe several important tools of the ecologist.
9. Describe various types of habitats and communities.
10. Demonstrate some methods used to study ecology.
11. Name several ways you can help to take care of the world God gave us.
12. Discuss pollution problems and possible ways of solving them.
13. Discuss energy problems and possible new sources of energy.
14. Discuss God's purpose and design in ecology.

Survey the LIFEPAC. Ask yourself some questions about this study and write your questions here.

1. PRINCIPLES OF ECOLOGY

In this section of your LIFEPAC and in later sections, you will study about **ecology**. Many sciences are included in ecology because it involves the **relationships** among all living things, their **environments**, and the forces that alter the environments. The study of ecology is important for you to understand your world. Students have asked, "Why should I be involved in all this study of the world?" The answer is simple: "Because it is the only world we have."

You will notice the word list found in the glossary is longer than in many other LIFEPACs. Ecology is a popular topic of discussion, but the definitions are not always clear. For this reason the glossary should be studied before beginning this section. As you understand ecology better, your choices should be wiser in taking care of your world.

An additional benefit to the student who studies and knows the words of the glossary is the help of word clues in understanding **principles** of ecology. You may have already learned that sciences are built not only on information but also on certain laws, or principles, which help to predict what will happen in problems, experiments, and real-life situations. As you learn more about ecology and its principles, you will be able to guess more correctly the outcome of questions you may have about the ecology of your neighborhood, country, and world.

Section Objectives

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

1. Define ecology.
2. Discuss how ecological relationships affect the environments of our world.
3. Relate some principles of ecology to specific concepts.
4. Discuss the parts of an ecosystem.
5. List reasons why plants and animals live in certain environments.
6. Define the balance of nature.
7. List examples of good management principles for taking care of environmental resources.

14. Discuss God's purpose and design in ecology.

Vocabulary

Study these words to enhance your learning success in this section.

community
ecologist
energy
food chain
organism
plankton
resource
concept
ecology
environment
habitat
photosynthesis
principle
zooplankton
dynamic equilibrium
ecosystem
environmental factor
interrelationships
phytoplankton
relationship

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.*

ECOSYSTEMS

Scientists are discovering that our world operates in a very complicated system of cycles. You may recall cycles such as the water (or *hydrologic*) cycle, the nitrogen (or protein) cycle, and the carbon (or organic) cycle. Briefly, in the water cycle the oceans are a source of water for cloud and rain formation, and eventually water that falls as rain returns to the ocean to be used again. Nitrogen is essential to protein formation, and carbon to the synthesis of foods. Both nitrogen and carbon are built into food molecules by green plants and are eventually converted back to atmospheric nitrogen and carbon or soil nutrients to be used again.

We are discovering that all life and the elements of the earth change in cycles. This discovery is not new. God told Noah (Genesis 8:22), "While the earth remaineth, seedtime and harvest, and cold and heat, and summer and winter, and day and night shall not cease," referring to the seasons changing in cycles. The secret of the cycle as a process is the continuous supply of **resources** for more building. If a process only builds, raw materials and resources may soon run out and bring a halt to the process. If foods could only be made, but not broken down, they could not be used for **energy**. Foods would not be decomposed to release the nitrogen and carbon necessary for making more foods. Without food, life on earth would soon vanish. This fact is part of our modern-day ecology problem. Cycles are no accident. God's wisdom and design are so much more than our human minds can imagine!

Definition. The word **ecology** is made up of two Greek words, *oikos* and *logia* which mean respectively *house* and *knowledge*. *House* means the *type of surroundings in which a group of plants and animals live*. *Knowledge* means the *science, or study, of these life houses*. Plants make the basic framework of the houses for other plants and many kinds of animals to occupy. Scientists who study ecology are called **ecologists**.

Ecology includes the study of how living things grow and survive and how each **organism** helps, depends on, or hinders other living things in the **environment**. These requirements and dependencies are all examples of **relationships** organisms have with their environments or with other living things.

You may wonder how the complicated relationships of some life houses come into being. In Hebrews 3:3-4 the Bible gives us an answer to our question, "... He who hath builded the house hath more honor than the house. For every house is builded by some man; but he that built all things is God." Just as life could not have happened by accident, neither could the life houses and ecological relationships be credited to fate or evolution. Because God has made everything, He alone is deserving of worship.

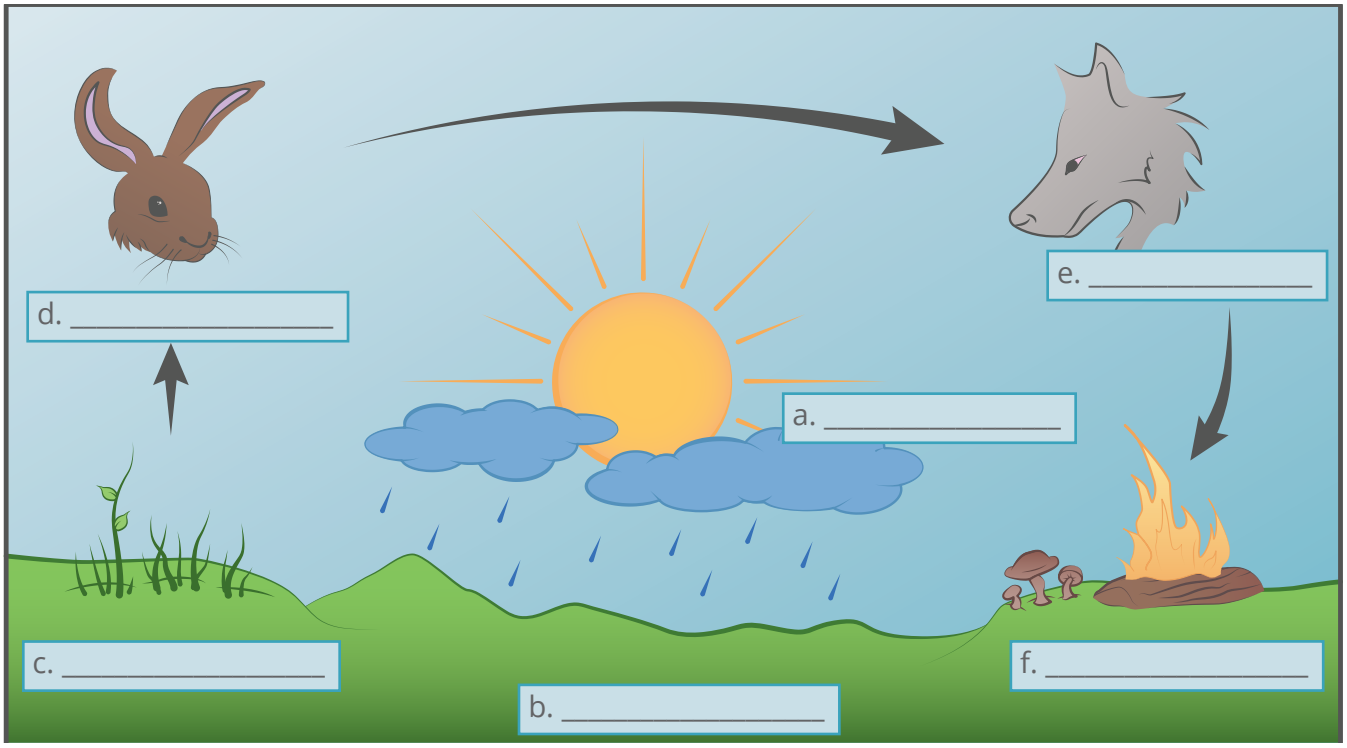
Ecological relationships. Understanding the **concept** of an **ecosystem** is basic to the study of ecology. If we add all the relationships of plants and animals to each other and their environment, we make what ecologists call an ecosystem. An ecosystem is a cycle with six main parts. The cycle shows how energy and food move through a series of relationships. The main parts of an ecosystem may be labeled: the sun; soil, water, and climate; green plants (food producers); herbivorous (plant-eating) animals; carnivorous (flesh-eating) animals; and decomposers (fire and nongreen plants such as fungi and bacteria). Each part of the ecosystem is essential for any group of living things to continue living in their environmental home as a group. If any part of the ecosystem is missing, the other parts of the system may be affected.

Some of the parts of the ecosystem are more critical than others. If the sun were missing, all

life on earth would die. If carnivores were missing, the herbivorous animals might be affected to a large extent, depending on the environment. An ecosystem could probably survive without carnivores or herbivores if the other four parts were present. Many plants could survive; however, those plants that are dependent on insects or birds for pollination and seed formation would not survive.

Complete the diagram.

1.1 Find the six main parts in the diagram of an ecosystem. Write the correct label on the matching picture part in the diagram. Notice the order of relationships in the cycle. The parts of an ecosystem always fit together in a sequence from sun to decomposers. (Energy in the form of food comes from the sun's energy.) Eventually, the energy is used or released and the foods are broken down releasing heat, energy, and raw materials.



Related principles. Some **principles** of ecology that may be stated using the ecosystem concept are listed:

1. Living things affect other living things.
2. Basic relationships or **interrelationships** exist between organisms and their environments.
3. Both the living and the nonliving are connected.
4. An ecological system, or ecosystem may be a single population of organisms in an environment; one or more **communities** of plants and animals in an environment; many communities in a region of the earth; or the entire planet.
5. Ecological systems and interactions are best understood by a thorough knowledge of the living and nonliving environment.
6. Changes in or controls of an ecological system affect more than the organism to be changed or controlled.
7. All energy and materials for life originate in the nonliving environment.
8. The numbers and kinds of organisms making up an ecosystem affect the flow of energy and matter through the cycle.
9. The ecosystem will break down if energy and matter are not constantly supplied or recycled.
10. Energy and matter are continually escaping from the ecosystem as they are being used by living things.
11. The cycles of nature illustrate order in the universe.

Some of these principles of ecology may seem too simple. Do not be misled into believing that simple things are not important. As a matter of fact, many of the principles of ecology are really common sense and sound thinking. Someone has said that the trouble with man is twofold—he cannot learn truths that are too complicated, and he forgets truths that are too simple.

One of the definitions of ecology is the study of ecosystems. As you have seen in this section of your LIFEPAC, ecosystems are the basic unit for understanding relationships and interactions between plants and animals and their environment.

Write the letter for the correct answer.

1.2 Ecology is made up of _____ .

a. mathematics
b. many sciences
c. the science of biology
d. animals

1.3 The basic framework for the life houses is composed of _____ .

a. plants
b. animals
c. decomposers
d. water

1.4 The process of decomposition releases into the environment _____ .

a. iron and lead
b. nitrogen and carbon
c. oxygen and helium
d. neon and argon

1.5 The word ecology comes from Greek words meaning _____ .

a. study of the environment
b. study of life
c. study of energy
d. study of houses

Make a diagram.

1.6 Sketch the ecosystem and label the six basic parts in proper order.

Answer these questions.

1.7 How are ecological relationships important to life? _____

_____

1.8 Why should you be involved in ecology? _____

_____

Complete this activity.

1.9 List five principles of ecology that use the ecosystem concept.

a. _____

b. _____

c. _____

d. _____

e. _____

ENVIRONMENTAL FACTORS

All environments on the earth are somewhat the same, but they are also different in many ways. Living things require certain building blocks to compose an environment for survival and growth. These building blocks of the environment determine where in the environments of our planet specific kinds of organisms live.

Building blocks. Plants and animals depend on building blocks of the environment that we probably do not even think about. These unique parts of the environment, some that we can see and some that we cannot see, are called **environmental factors**. Some of the most important factors we can measure or detect are light, temperature, water, air, minerals, elevation, surface features, and growing seasons. Environments differ when variations, more or less, exist in the amounts of each of these factors. Environments and some environmental factors are studied and measured by the use of space satellites.

Habitat variation. We might imagine these environmental factors as actual building blocks. Environmental factors build **habitats**, the places where plant and animal communities live. You may wonder if these environmental factors are really important. The proper combination of these building blocks is essential for an organism to survive in a habitat.

If we vary the amounts of each environmental factor, different habitats can be designed. Consider some of these habitat variations. If a location has too much light and a scarcity of available water, the habitat may be a desert. If the "building block" for light is small, or absent, the habitat may be a cave with little or no light. If much water is present, the habitat may be a pond, a lake, or an ocean. The elevation may vary from a high mountaintop to a deep ocean canyon to create two entirely different habitats.

What kind of environmental factors determine whether the habitat is a salt flat in Death Valley or a farmer's cornfield in Iowa? What kind of environmental factors determine if the habitat is on a rock or under one?

| Building Blocks of a Habitat

Habitats in the country have air with more oxygen than smoggy air in the city. Gases in the air affect habitats. Air on mountaintops has less oxygen and less air pressure than air at sea level.

Plants can keep growing all year round near the equator, but the farther from the equator we travel, the shorter the growing season becomes. Growing seasons affect and build habitats, too.

If you have ever wondered how the earth could have so many different kinds of life, consider the many different kinds of habitats that exist. A fish is not designed for life on the hot desert sands; nor is an elephant designed for a

mountainous life. Environmental factors build habitats. Studying these factors helps us to understand how God planned for living things to live in certain habitats.

Related principles. Some principles of ecology that may be stated using the environmental factors concept are listed.

1. Organisms living in an area persist because their life requirements fit that particular habitat.
2. Environmental requirements and tolerances determine the distribution of a species of plant or animal.
3. Similar communities of living things are evidence of similar environmental factors.
4. Environmental factors operate together, not alone.
5. The extremes of conditions determine whether the habitat is suitable for an organism.
6. The hereditary characteristics of organisms limit or define their requirements for environmental factors.
7. Just as no two thunderstorms or forest fires are exactly alike, no two bodies of water or landscapes are identical.
8. Numbers of organisms can often be controlled by changing the limiting environmental factors.
9. When people do something to the natural environment, reactions happen that are often different than expected.
10. Organisms with similar requirements often compete for environmental factors.

One of the definitions of ecology is the interrelationship of living things to each other and to their environment. As you have seen in this section of your LIFEPAC, the nonliving environment is essential in providing the source of energy, materials, and conditions for living things to survive, grow, and multiply.

Write the letter for the correct answer.

1.10 A habitat is best described as _____ .

a. the place where organisms live
b. the organisms that live in a place
c. the factors controlling the organisms

1.11 Some environmental factors are studied by the use of _____ .

a. space satellites b. telescopes c. astrolabes d. electroscopes

1.12 A habitat that has less oxygen and less air pressure than many organisms require would be a _____ .

a. cave b. desert c. high mountaintop d. seashore

1.13 The _____ is longer at the equator than at other places on the earth.

a. winter b. growing season c. surface feature d. mineral

Complete these activities.

1.14 List eight important environmental factors that affect a habitat.

_____

_____

1.15 Construct and label one habitat you know about, using the building blocks idea for environmental factors. Select any three environmental factors.

1.16 Explain one of the following principles of ecology related to environmental factors.

a. Organisms living in an area persist there because their life requirements fit that particular habitat.

b. Organisms with similar requirements often compete for environmental factors.

a. _____

_____

_____

_____

b. _____

_____

_____

_____

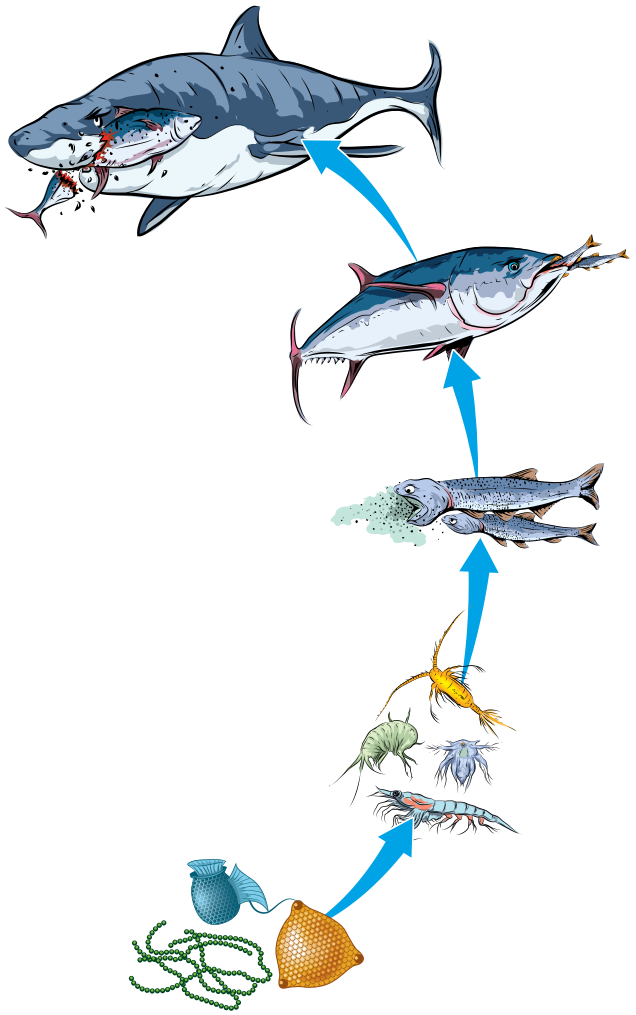
FOOD CHAINS

All forms of life on earth are tied or linked together in some type of food relationship. In such a **food chain**, living things eat or are eaten. All of the food chains in plant and animal communities make up the food web. To better understand the food dependencies of plants and animals, we will discuss in more detail the food chain concept of ecology in this section.

Energy for life. In other LIFEPACs you have learned that the sun is the earth's only source of energy. The sun is 93 million miles away from the earth. Energy from the sun in the form of light takes about eight minutes and twenty seconds to travel from the sun to the earth. Without the right amount of sunlight and heat, no life would exist on earth.In Colossians 1:16-17 we read about the Creator and His claim on everything, "For by him were all things created, ... and by him all things consist." The Lord Jesus is the Creator. He designed and built life on earth to be dependent on the sun.

Green plants were designed to trap the sun's light energy. Chlorophyll is the green chemical that traps light. **Photosynthesis** is the process, or way, in which green plants trap light energy in food molecules. Food from green plants feeds all life on earth. Food produced by green plants gives the sun's energy to all other living things. You could stand in the sun's light all day and not get any food energy at all. Without green plants, no life would exist on earth. Green plants, therefore, are essential. You may wish to review the photosynthesis portion of the Science LIFEPAC 1005 to recall what happens when the sun's energy is trapped by green plants.

Links in the chain. Green plants are the first link in any food chain. We know green plants grow on land as grasses, herbaceous plants, shrubs, and trees. Other green plants, such as algae, mosses, and ferns also produce food on land.



| Example of a Food Chain

Green plants also grow in lakes and oceans. You may have seen seaweed along the seashores. Seaweed is usually brown algae which also contain chlorophyll and make food; however, the most important food-producing green plants of the oceans float near the surface of the water. You may have never seen tiny, floating plants, or **phytoplankton**. In fact, many kinds of **plankton** (tiny, floating organisms) are so small they can be seen only with a microscope. If you have the opportunity, phytoplankton and **zooplankton** are worth taking the time to see. Plankton come in very unusual and beautiful designs. Another name

for phytoplankton is "the grass of the seas" because it is the basic food link for all ocean creatures. Aquatic food chains tend to be shorter and simpler than land food chains and less varied.

Food chains may have many different links after the first green plant link. All food chains show how the sun's energy is passed as food from plant to animal, to animal, and on and on to the last and largest link. A food chain may be very short or very long.

Related principles. Some principles of ecology that may be stated using the food chain concept are these:

1. Everything living depends on something else for its life.
2. Sunlight is essential for life on earth.
3. The ultimate source of energy is the sun.
4. Green plants are the receivers and transformers of solar energy; therefore, they are the basis of all life on earth.
5. Food chains are pathways for obtaining, using, and transferring energy.
6. Basically, plants produce food; and animals consume food.
7. All living things are linked in the food chain.
8. The survival of the organisms at each link of a food chain depends on the survival of the organisms in each of the previous links. When a link in the chain weakens, the rest of the food chain is affected. Starvation of organisms following the weak link may result.

Another definition of ecology explains the transfer of food and energy in terms of food chains. As you have seen in this section of your LIFEPAC, plants, as the first link in a food chain, trap solar energy in the form of food for all other links in the chain.

Complete these statements.

1.17 All forms of life on earth are linked together in relationships involving _____ .

1 18 Light energy from the sun takes about _____ to travel from the sun to earth.

1.19 The energy in food first comes from _____ .

1.20 The process in which green plants trap light energy to produce food is _____ .

1.21 "For by him were all things created" refers to the person of _____ .

1.22 The green chemical that traps light in plants is _____ .

1.23 The first link in any food chain is always a _____ .

1.24 The most important food-producing green plants of the ocean are _____ .

Complete these activities.

1.25 Explain how a food chain works. Use both words and diagrams in your explanation.

1.26 Explain what is meant by "grass of the seas."

1.27 List some differences between land and aquatic food chains.

BALANCE OF NATURE

The balance of nature means many things. We talk about nature being balanced when people leave nature alone. We talk about regaining the balance of nature when an environment has been left to nature to mend and heal. We might think that, to be balanced, nature has to be left alone. We might think that, to be balanced, nature has to always stay the same. Neither of the latter two ideas is true.

People can help to manage and balance nature. Nature does not stay the same. Plants and animals you see one year are not always the same ones you see next year. Plants and animals are born, grow, reproduce, and die year after year. Nature is constantly changing. Although environments may seem to stay the same, they are also changing. We shall examine more closely the concept, balance of nature, in this section.

Definitions. When ecologists talk about the balance of nature, they are referring to the amount of food, water, and space required for all living things of a community. A community would be balanced if the number of organisms remained the same year after year. Remember, ecology is concerned with relationships. To keep a community's balance of nature, relationships also must remain more or less the same. The community is changing, but the numbers of organisms and their relationships stay about the same.

A living seesaw. We can think of the balance of nature as a seesaw. When the seesaw is level, a balance of nature exists in a plant and animal community. When either side of the seesaw is down or up, the balance is upset. On one side of the seesaw are the living things in the community. On the other side are the environmental factors: food supply, space to grow, the number of organisms, and the nutrients of life. When the seesaw is balanced, we say it is in a state of **dynamic equilibrium**. The rates of change for both sides are about equal. (See Figure 1.)

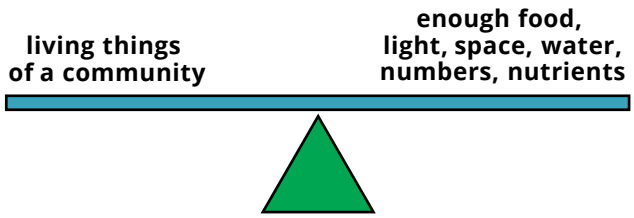
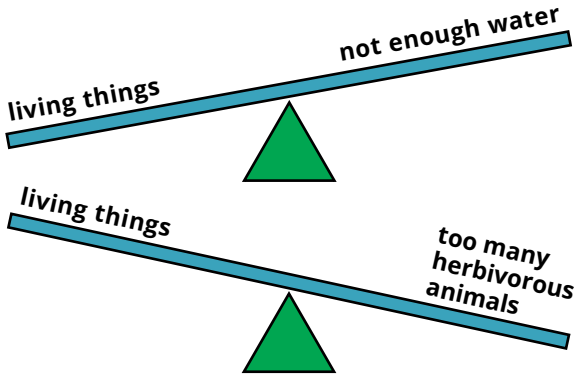


Figure 1 | A Community in Dynamic Equilibrium

Upsetting the balance. What causes the balance of nature to be upset? Any one or a combination of the following changes can upset the balance of nature:

1. Too much, or not enough, water;
2. Not enough food;
3. Not enough space;
4. Too much, or not enough, light;
5. Too much, or not enough, of a nutrient;
6. Too many, or too few, kinds of plants, or animals.



| Unbalanced Communities

Natural happenings like floods, drought, fires, and volcanoes may cause the balance of some communities to be upset. Diseases, plant and animal pests, and new kinds of plants or animals that invade a community often cause serious upsets. People upset the balance of nature when they do not make wise choices. Impatience, greed, and selfishness encourage poor choices, such as building too many houses and

factories, digging too many mines, cutting too much timber, polluting air and water, killing too many animals, decorating with concrete instead of green plants, picking too many wildflowers, making too many trails in wilderness areas, buying too many things, throwing away instead of repairing, dumping dangerous chemicals without treatment, and many other ways.

Restoring the balance. What happens when the balance is upset? If the upset is small, the balance may soon return without any help. The changes that cause a small upset are also probably small. If an upset is large, the whole community of plants and animals may die. Large upsets are caused by major changes, which may be sudden or drastic. Large upsets may never be repaired or may take years to repair. Dynamic equilibrium may be permanently lost for that community of living things.

When you begin to think about what is happening in the world around you, an understanding of the balance of nature should help you to make wiser choices. Changes are happening rapidly. Some environments are only damaged, others are completely changed. People are part of the global ecosystem. If "life affects other life" is a valid ecological principle, then people could be in serious trouble. Wiser choices must be made in environmental uses today and in the future. Further unthinking destruction must be avoided.

People are learning how fragile our environments are. They are beginning to understand the importance of relationships and how they work to keep communities of living things alive. People are learning to manage environments and the plants and animals that live in them more wisely.

Where people live and how they use the land, water, and air of the earth are important to keep people alive as well as the other living creatures God has given people to manage wisely. God has given each of us that responsibility—to make wise choices for ourselves and each other. The answer to Cain's infamous question, "Am I my brother's keeper?" is clearly "Yes!" in God's Word.

Man's responsibility for good management of the earth's resources is found in many passages of the Bible. A passage full of praise to God and responsibility to man is Psalm 8:3-9: "When I consider thy heavens, the work of thy fingers, the moon and the stars, which thou hast ordained; What is man, that thou art mindful of him? and the son of man, that thou visitest him? For thou hast made him a little lower than the angels, and hast crowned him with glory and honor. Thou madest him to have dominion over the works of thy hands; thou hast put all things under his feet: All sheep and oxen, yea, and the beasts of the field; The fowl of the air, and the fish of the sea, and whatsoever passeth through the paths of the seas. O Lord our Lord, how excellent is thy name in all the earth!"

Related principles. Some principles of ecology that use the balance of nature concept are these:

1. Natural environments tend to maintain balances.
2. When a living system cannot adjust to variations or changes in its environment, it dies and decays. Living organisms and systems constantly change.
3. Living things only come from previous living things.
4. Unusual events often have a controlling effect on organisms and living systems.
5. Organisms live in certain environments because of the interaction of many factors, rather than one factor.
6. Everything living depends on something for its life.
7. When people do something to the natural environment, reactions happen that are often different than expected.

8. Natural catastrophes do not commonly destroy healthy and diverse living systems. Diverse systems are more resistant to natural catastrophes, such as diseases and pests.
9. Single species systems commonly selected by man are more susceptible to natural catastrophes.
10. Living systems have self-repairing and recovery abilities within limit
11. Air, water, and soil are essential to life.
12. All food for life is provided by plants directly or indirectly.
13. Nothing is free in nature; what is removed must be replaced.
14. Introducing new or invading species or substances should be carefully considered if other alternatives are not suitable.
15. Good management adjusts living things to the environment with small changes.
16. Good management duplicates natural processes of an environment.
17. Good management decisions are based on biology, ecology, and environment considerations, not on politics, economics, or technology.
18. Poor management of renewable resources and living systems can make them nonrenewable.
19. Life is the most precious natural resource.

Another definition of ecology is the application of many sciences in helping to solve the changing and often complicated problems of the local and global environments. As you have seen in this section, good management is an important step in finding solutions to restore balance to the environments.

Write true or false.

1.28 _____ Ecology is concerned with relationships.

1.29 _____ Good management practices are based on politics and economics.

1.30 _____ Air, water, and soil are not essential to life.

1.31 _____ Not having enough space can upset the balance of nature.

1.32 _____ A small upset in the balance always results in the death of a whole community.

Complete these activities.

1.33 The balance of nature can be better understood by knowing the meaning of dynamic equilibrium. Discuss in a short paragraph this phrase and how it affects the balance of nature. _____

_____

_____

_____

1.34 Show by diagrams three different ways the balance of nature may be upset.

1.35 List five examples of good management to maintain or restore the balance of nature.

a. _____

b. _____

c. _____

d. _____

e. _____

1.36 Why should everyone understand something about ecology?

_____

_____

_____

_____

TEACHER CHECK _____ initials _____ date

Review the material in this section to prepare for the Self Test. The Self Test will check your understanding of this section. Any items that you miss on this test will indicate specific areas you need to restudy.

SELF TEST 1

Match these items (each answer, 2 points).

1.01 _____ phytoplankton

1.02 _____ relationships

1.03 _____ ecosystem

1.04 _____ environment

1.05 _____ balance of nature

a. tiny animals

b. surroundings

c. dynamic equilibrium

d. cycle

e. grass of the seas

f. dependent, competitive

Answer true or false (each answer, 1 point).

1.06 _____ Organisms with similar requirements usually share environmental factors.

1.07 _____ All forms of life on earth are linked together in some type of food relationship.

1.08 _____ The ultimate source of energy for life on earth is the sun.

1.09 _____ Everything living depends on something else for its life.

1.010 _____ The balance of nature is like a living seesaw.

1.011 _____ Nature is not balanced as long as a state of dynamic equilibrium exists.

1.012 _____ Only people upset the balance of nature.

1.013 _____ Nothing is free in nature; what is removed must be replaced.

1.014 _____ Habitats vary because environmental factors vary.

1.015 _____ Every time people do something to the environment, reactions usually happen as predicted.

Complete these statements (each answer, 3 points).

1.016 The word *ecology* is made up of two Greek words meaning a. _____ , and b. _____ .

1.017 Common needs, mutual benefit, and interactions are all examples of _____ .

1.018 All relationships of living things to each other and to their environment added together form _____ .

1.019 The sun's energy is trapped by a chemical,_____ .

1.020 The last three parts of an ecosystem in order are a. _____ , b. _____ and c. _____ .

1.021 When a living system cannot adjust to environmental changes, it begins to _____ .

1.022 Good management duplicates _____ .

1.023 Good management decisions are based on a. _____ , not on b. _____ .

1.024 Environmental factors may be studied by using space _____ .

1.025 A scientist who studies ecology is "termed" a(n) _____ .

Match these items (each answer, 2 points).

1.026 _____ habitat

1.027 _____ herbivorous

1.028 _____ decomposer

1.029 _____ resource

1.030 _____ organism

a. sun

b. used to aid or assist

c. bacteria

d. place

e. living plant or animal

f. animal

Complete these activities (each answer, 5 points).

1.031 Explain what is meant by *relationships* in ecology.

_____

_____

_____

1.032 Explain how a food chain operates.

_____

_____

1.033 List two examples of good management to maintain or restore the balance of nature. (5 points)

a. _____

b. _____

1.034 Name five environmental factors. (5 points)

a. _____

b. _____

c. _____

d. _____

e. _____

74/92 **SCORE** _____ **TEACHER** _____ _____
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