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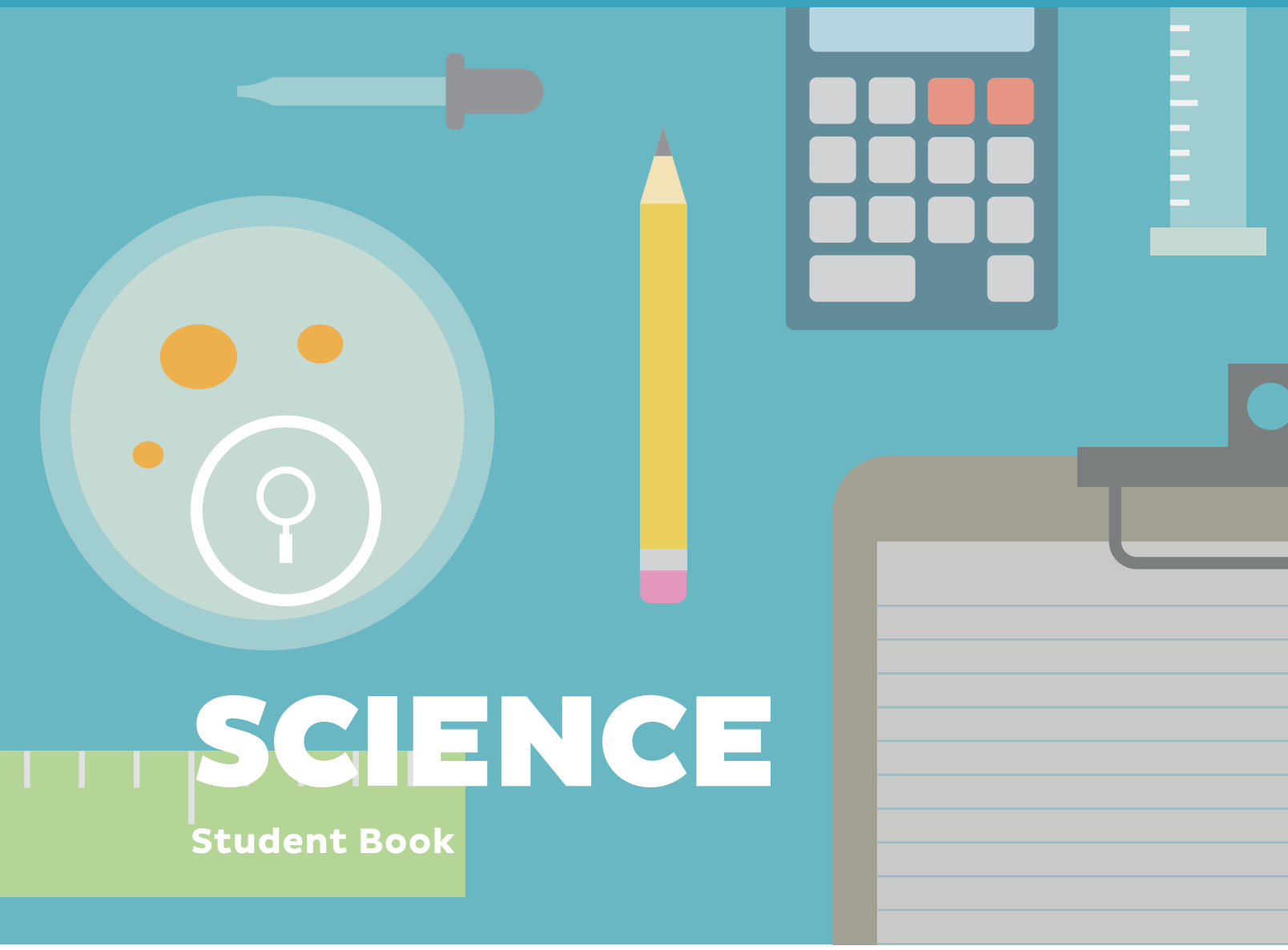

SCIENCE

Student Book

5th Grade | Unit 3

Alpha Omega
PUBLICATIONS

SCIENCE 503
ANIMALS: LIFE CYCLES

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Alpha Omega
PUBLICATIONS

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ANIMALS: LIFE CYCLES

God has created a rich variety of animals. In the Book of Genesis, we read: "And God said, Let the waters bring forth abundantly the moving creature that hath life, and fowl that may fly above the earth in the open firmament of heaven. And God created great whales, and every living creature that moveth, which the waters brought forth abundantly, after their kind, and every winged fowl after his kind: and God saw that it was good. And God blessed them, saying, be fruitful, and multiply, and fill the waters in the seas, and let fowl multiply in the earth. And the evening and the morning were the fifth day. And God said, Let the earth bring forth the living creature after his kind, cattle, and creeping thing, and beast of the earth after his kind: and it was so. And God made the beast of the earth after his kind, and cattle after their kind, and every thing that creepeth upon the earth after his kind: and God saw that it was good." (Genesis 1:20-25)

Fish, birds, insects, lizards, cattle, and bears are all examples of the animals that God has created. In this LIFEPAC®, you will explore the rich variety of animals found in the waters and on the earth. You will also learn about some one-celled, animal-like protists such as amoeba and paramecium. You will examine aspects of the life cycles of these living things. You will learn about some similarities and differences among various animals and protists. You will also learn about their common structures 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 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. Describe the life cycles of invertebrates.
2. Explain the differences between the life cycles of invertebrates.
3. Describe the life cycles of vertebrates.
4. Explain the differences between the life cycles of vertebrates.
5. Name the groups to which the animals belong.
6. Show the relationship of the structures of animals to their reproduction in a life cycle.

1. INVERTEBRATES

In the previous LIFEPAC, Science 502, you learned that God has created a great variety of living things. You learned that scientists classify all living things into 5 kingdoms: animals, plants, fungi, protists, and monerans. In the previous LIFEPAC, you studied the life cycles of plants, fungi, protists, and monerans. In this LIFEPAC, you will learn about the life cycles, structures, and reproduction of animals. We will also cover a couple of examples of one-celled, animal-like protists in this LIFEPAC. We will cover these protists because, like almost all animals, they are able to move about in their environments.

God has created such a rich variety of animals that no one knows for sure how many kinds of animals there are! Scientists have classified and named over one and a half million different kinds of animals. However, many scientists believe that there may be from two million to as many as fifty million different kinds of animals. Many new kinds of animals are discovered, named, and classified each year. The world of animals is exciting! The study of animals is called zoology, and scientists who study animals are called *zoologists*.

Objectives

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

1. Describe the life cycles of invertebrates.
2. Explain the differences between the life cycles of invertebrates.
5. Name the groups to which the animals belong.
6. Show the relationship of the structures of animals to their reproduction in a life cycle.

Vocabulary

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

amoeba (ə mē′ bə). A microscopic, one-celled protist.

carnivores (kär′ nə vorz). Animals that eat only other animals. They are also called meat-eaters.

extends (ek stendz′). Stretches out or reaches out.

flukes (flüks). Flatworms of a certain type.

fragmentation (frag′ mən tā′ shən). A method of asexual reproduction in animals by the division of the body into two or more pieces.

gills (gilz). The parts of a fish body that take oxygen from the water.

herbivores (her′ bə vorz). Animals that eat only plants.

host (hōst). An animal that has another animal living in or on it.

invertebrates (in ver′ tə brəts). Animals that do not have backbones. Insects, jellyfish, snails, spiders, and worms are examples of invertebrates.

larva (lär′ və). The worm-like form of an early stage in the life cycle of some insects.

larvae (lär′ vē). Plural form of larva.

maggot (mag′ ət). The larva of a fly.

mollusks (mol′ əsks). Animals with soft bodies. Adults often grow hard shells. A snail is an example of a mollusk.

nymph (nimf). The part of certain insect life cycles where the young animal has no wings or reproductive organs.

octopus (ok′ tə pəs). A mollusk with a soft body and eight long arms.

omnivores (om′ nə vorz). Animals that eat both plants and animals.

paramecium (par′ ə mē′ see um). A one-celled, animal-like protist that has a special shape.

parasites (par′ ē sīts). Animals that live on or in other animals. They get their food from the hosts.

protozoans (prō′ tə zō ənz). A large group of one-celled protists.

pupa (pyü′ pə). The form of certain insects between the time they are larvae and adults.

pupae (pyü′ pē). Plural for pupa.

squid (skwid). A mollusk that lives in the sea.

testes (tes′ tēz). The body parts of male animals where sperm is formed.

variety (və rī′ ə tē). Different kinds or types.

vertebrates (vėr′ tə brits). Animals that have backbones. Birds, fish, reptiles, and mammals are examples of vertebrates.

zoology (zō ol′ ə gē). The science of the study of animals.

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**ã**re, f**ä**r; l**e**t, **ē**qual, t**ė**rm; **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 take**n**, /i/ in penc**i**l, /o/ in lemo**n**, and /u/ in circ**u**s.

Like plants, animals come in many shapes and sizes. Most kinds of animals are less than an inch long. Some are so tiny that they can only be seen with a microscope. Other animals are very large, like the elephant, the giraffe, and the blue whale.

As you learned in previous LIFEPACs in this series, animals and plants are dependent on one another. Plants depend on the carbon dioxide given off by animals and human beings. In turn, animals and human beings depend upon plants for oxygen and food. As you learned, this cycle of life is called the *carbon cycle*. In addition, some plants depend upon animals to reproduce. For example, bees and birds carry pollen from plant to plant so that the plants might be fertilized.

Animals differ from plants in their ability to move around in their environment. Most plants are fixed on one place by roots or root-like structures. However, almost all animals can move around from one location to another.

| Reptiles, like snakes, are cold-blooded; their body temperature is based on their surroundings. The sidewinder snake (above) moves sideways in order to move forward.

There are many ways to classify the different kinds of animals. For example, some animals live on the land, while others live in water. Some animals are *cold-blooded*, while others are *warm-blooded*. Cold-blooded animals are warm when their surroundings are warm or cool when their surroundings are cool. Warm-blooded animals, however, almost always have the same body temperature regardless of the temperature of their surroundings.

| Dolphins are warm-blooded mammals. They require air to breathe, unlike fish.

Animals can be classified according to what they eat. Animals that only eat plants are called **herbivores**. Cows and giraffes are examples of herbivores. Animals that eat only other animals are called **carnivores** or *meat-eaters*. Lions, sharks, and dogs are carnivores. Animals that eat both plants and animals are called **omnivores**. Bears are omnivores.

Animals can also be classified according to whether or not they have backbones. Animals that do not have backbones are called **invertebrates**. The vast majority of animals are invertebrates. Insects, jellyfish, snails, spiders, and worms are examples of invertebrates. Animals that do have a backbone are called vertebrates. Birds, fish, reptiles, and mammals are examples of **vertebrates**.

In this LIFEPAC, we will study animals by classifying them as either invertebrates or vertebrates. In this section of the LIFEPAC, you will learn about invertebrates. In the next section, you will explore vertebrates.

Complete these statements.

1.1 Scientists classify all living things into _____ kingdoms.

1.2 The study of animals is called _____ .

1.3 Scientists have named and classified over _____ different kinds of animals.

1.4 _____ animals are warm when their surroundings are warm and cool when their surroundings are cool.

1.5 Animals that eat both plants and other animals are called _____ .

1.6 Animals that do not have backbones are called _____ .

1.7 Animals differ from plants in their ability to _____ in their environments.

What is your favorite animal? Why? Look up some information on this animal in a book or encyclopedia, the library, or the Internet. Then, write a short paper (less than one page) about your favorite animal. Include some information about where the animal lives, what it eats, how it breathes, and any other things that you find interesting about your favorite animal. Let your teacher read about your favorite animal when you have finished.

Teacher check:

Initials _____ Date _____

Life Cycles of Invertebrates

In the previous LIFEPAC Science 502, you learned that living things go through *life cycles*. There are various *life stages* in a life cycle of living things; for example, beginning, growth, adulthood, and end. Animals go through life stages, too. They also begin, grow, and become adults. For example, consider the earthworm. The earthworm has no backbone, so it is an invertebrate. The earthworm begins life as a tiny, fertilized egg. After hatching from the egg, it grows into a mature worm. When it reaches maturity, it mates with another earthworm and lays many new eggs. Finally, the earthworm gets old and dies. The earthworm is just one of many types of worms. Worms have soft, slender bodies and no backbones or legs. Other examples of worms besides the earthworm are flatworms, roundworms, and leeches. Other worms may have life cycles like the earthworm. They may differ, however, in the number of offspring that they produce. Other worms may reproduce more times or fewer times. All worms are invertebrates. Yet, not all invertebrates have life stages like those of the earthworm. You will now learn some things about the various life stages of invertebrates.

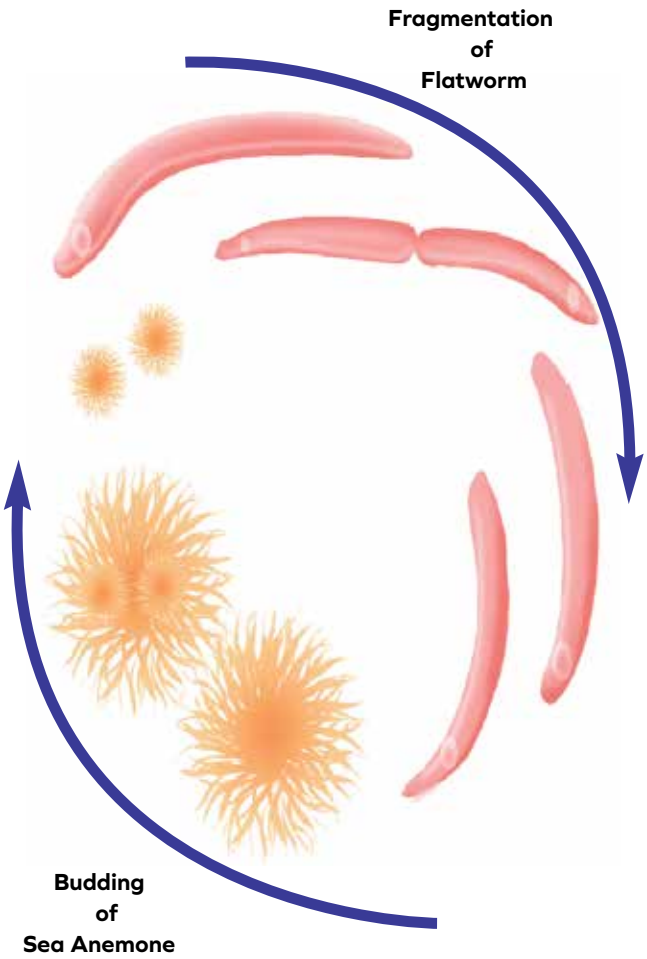
Answer these questions.

1.8 What is a *life cycle* of a living thing? (You may need to refer to the Science 502 LIFEPAC, Section I to help you answer this question.)

1.9 Why is an earthworm an invertebrate?

Beginning stage. Like almost all living things, the first stage in the life cycle of invertebrates begins with reproduction. Invertebrates can reproduce in one of two ways: (1) *asexual reproduction*, and (2) *sexual reproduction*. In asexual reproduction, only one parent is needed to produce an offspring. In sexual reproduction, two parents—one male and one female—are needed to produce offspring. Most animals and invertebrates reproduce through sexual reproduction.

Asexual reproduction only takes one parent to produce an offspring. This happens in two ways: (1) **fragmentation**, or (2) budding. Fragmentation is used by invertebrates such as planarians and some other flatworms. In this method of reproduction, a single parent usually divides into two pieces, one with the head and the other with the tail! Each section then grows the parts that are missing and becomes a completely new individual animal. Budding occurs when the animal produces small projections, called *buds*, from its side. (You learned about this process for cells and plants in the previous LIFEPACs in this series.) Invertebrates known as hydras and some sea anemones reproduce by budding. The buds develop into tiny copies of the parent. Eventually, the buds grow large enough to detach from the parent and become a new individual animal.



| Asexual reproduction

Sexual reproduction is used by most animals and invertebrates. In this method, a male sperm unites with a female egg cell to produce a fertilized egg. It is at this point that a new animal life begins. The means of fertilization can either occur outside the female body or within the female body.

In sexual reproduction, the beginning stage of the life cycle starts with a single cell. This cell is produced through fertilization of a female egg cell with a male sperm cell. After it is fertilized, the egg cell begins growing and reproducing. This is the next stage in the life cycle of the invertebrate: the growth stage.

Match these items.

1.10 _____ asexual reproduction

1.11 _____ sexual reproduction

1.12 _____ fragmentation

1.13 _____ budding

1.14 _____ fertilization

a. the result of a male sperm combining with a female egg

b. a single parent divides into two or more pieces

c. only one parent needed to produce offspring

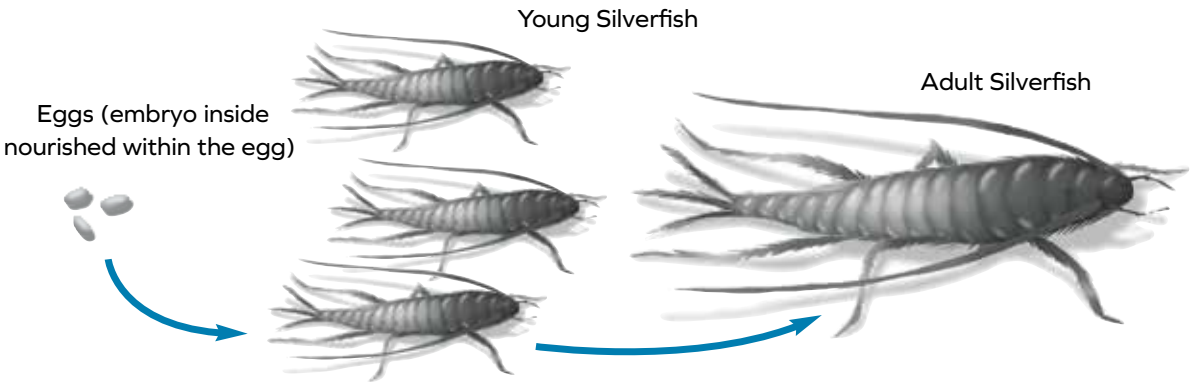
d. two parents, male and female, needed to produce offspring

e. produces small projections from one parent which split off to form offspring

f. the process of cell division

Growth stage. Sexual reproduction can occur either within or without the female body; that is, the sperm may either reach the egg inside the female body or outside the female body. If fertilization of the egg occurs within the female body, the fertilized egg is then laid outside the female body. If the fertilization took place outside the body, the fertilized egg remains outside the female's body. Now an embryo begins to form within the fertilized egg. This occurs through the process of *mitosis*, the division of cells. (Recall that you learned about mitosis in previous LIFEPACs in this series.)

Each fertilized egg contains some food for the growing embryo. Growth of the embryo inside the egg is the first part of the growth stage. As soon as the new animal can live outside the egg, it hatches from the egg.



| Growth stages of silverfish

Other invertebrates go through a different process of growth after hatching from an egg. They are hatched in **larva** form. (You will learn more about this later in this section.) **Larvae** do not look like their parents. They turn into **pupa** form before becoming adults. Larvae and some **pupae** get their own food as they grow.

Some other invertebrates have an even different process occur during their growth stage. After hatching from an egg, the new invertebrate is called a **nymph**. (You will learn more about this later in this section.) The nymph looks somewhat like the parent invertebrate, but some parts are missing. Nymphs are able to get their own food for continued growth. As they grow, they begin to form the missing parts of their bodies that will allow them to become adult invertebrates.

Answer *true* or *false*.

1.15 _____ An embryo forms inside a fertilized female egg of invertebrates.

1.16 _____ Embryos must search for their own food outside the egg.

1.17 _____ After hatching, the "baby" of some invertebrates looks like a miniature adult.

1.18 _____ Some invertebrates hatch in larva form and become a pupa before becoming an adult.

1.19 _____ A nymph looks somewhat like a parent invertebrate, but some body parts are missing.

Adult stage. The adult stage of an invertebrate is reached when it grows to full size and is able to reproduce. It looks very much like its parents. Its form will change very little during the adult stage. It can begin to reproduce. Some invertebrates will reproduce many times during their adult stage.

The egg-laying female invertebrate may produce many eggs at one time. Most of these eggs may be fertilized by sperm from the male invertebrate. The new fertilized eggs are then deposited outside the body of the female if they were not already outside the body. New animals are formed just like the parent began. These hatch into babies. The babies grow. Life for that species continues.

Old age and death. Some invertebrates live to an old age. For a few invertebrates, old age arrives soon after they reproduce one time. Death will follow soon after. Other invertebrates may live to reproduce many times before old age begins. In each invertebrate, old age causes some parts of the body to stop working as they did before. The invertebrate gets weaker. Its life comes to an end, and it dies.

| A wolf spider carries her egg sac. Once the babies hatch, she carries them on her body.

Most invertebrates do not reach old age. They die at an earlier stage in the life cycle. The harsh conditions of changing weather can cause the death of invertebrates. Larger animals feed on invertebrates. Other reasons may cause an early death. Yet, enough of these animals survive so that life can continue as they grow to adulthood and reproduce. They usually lay many more fertilized eggs than needed so that life can continue for each kind of invertebrate. God continues the cycle of life for His creatures.

Answer these questions.

1.20 What happens when an invertebrate reaches adulthood? _____

_____

_____

_____

1.21 Why are so many eggs produced by invertebrates? _____

_____

_____

_____

_____

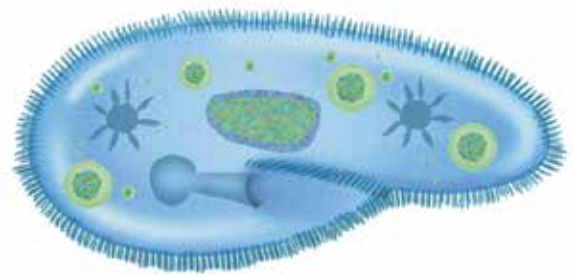
One-Celled, Animal-Like Protists

As you learned in the Science 502 LIFEPAC, protists are one of the five kingdoms of living things. They can be unicellular (one-celled) or multicellular (many-celled). Some protists have characteristics similar to plants, such as green algae and red algae. Other protists have characteristics similar to animals, such as **protozoans**. In fact, in the past, many people included these animal-like protists into the animal kingdom. Because these animal-like protists are able to move around like animals and have no backbones like invertebrates, we will briefly discuss them in this section.

| Amoeba

Protozoans are one-celled, animal-like protists. There are more than 30,000 different kinds of protozoans. They like to live in moist places. Some of them live in the sea, others in fresh water. They also live in soil, plants, and animals. Some even live within your mouth and intestines!

The **amoeba** and the **paramecium** are two of the more common kinds of protozoans. They have similar life cycles. Their life cycles compare closely to other protozoans, too. By examining the amoeba and the paramecium, we can learn a lot about the whole group of protozoans.



| Paramecium

Structure. The amoeba and the paramecium are both *eukaryote*, one-celled organisms; that is, they both contain a cell membrane, cytoplasm, and a nucleus. Amoeba and paramecium do not have legs, arms, eyes, or hearts. Neither do they have places for sperm or eggs to grow.

The amoeba is one of the simplest protozoans. The single cell that makes up the body of the amoeba carries on all the necessary functions for life. The amoeba eats, breathes, moves, and responds to its surroundings. In these ways, it is animal-like.

The amoeba does not have a basic shape. It changes shape often. The nucleus in the amoeba moves around within the cell to different positions. When the amoeba wants to move, a "false foot" extends out from the cell body and makes it move.

The paramecium has a stiffer cell membrane than the amoeba. This membrane helps give the paramecium a definite shape. The membrane has many tiny openings. Some of the cytoplasm within the cell **extends** through the openings to form small "hairs." These hairs move or "wave"

in the surrounding water. This allows the paramecium to move about in the water.

Food is taken in by protozoans through the cell membrane. The paramecium has a definite groove on one side of its cell membrane that serves as a mouth. Food taken in by the protozoans is dissolved in the cytoplasm. To stay alive and to grow larger, the protozoan needs the food. Waste is also removed back through the cell membrane to the surroundings.

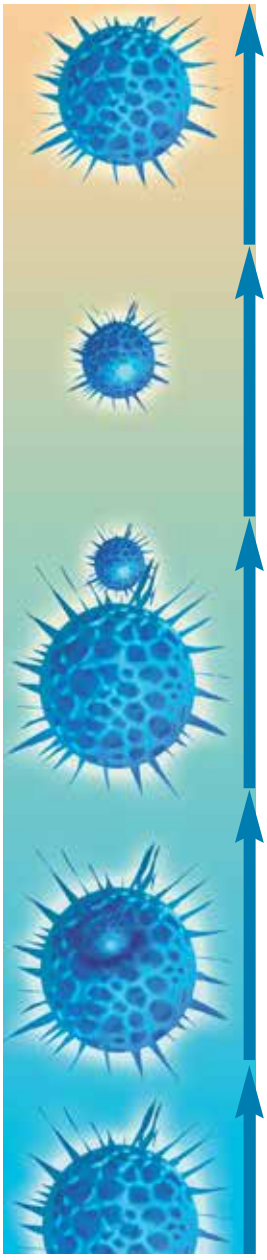
The protozoans breathe by taking in oxygen through the cell membrane. This is accomplished by a process known as *osmosis*. The oxygen is used by the protozoan to burn up the foods for energy. As a result, carbon dioxide is produced and is passed out of the cell membrane through osmosis.

Reproduction. Reproduction in most protozoans occurs through mitosis. Soon after the parent protist becomes full-sized, the nucleus divides. Part of the cytoplasm surrounds each new nucleus. The two new cells then split apart, forming two new offspring. Each of the new protozoans has a nucleus and half of the parent's cytoplasm.

After splitting apart, the two new protozoans are able to live apart. They each get more food. They breathe. Growth takes place. They become adults and then reproduce through mitosis.

Protozoans reproduce in other ways, too. Some protozoans reproduce through *budding*. The parent cell suddenly swells in one direction. The swollen part (the *bud*) breaks off and forms a new protozoan. Certain protozoans reproduce by dividing into many cells called *spores*. In this way, they reproduce like some plants and fungi. Other protozoans show the beginnings of *sexual reproduction*, where male and female parents with sperm and egg are required. In all the forms of protozoan reproduction, the cell's nucleus is divided among the new individuals. God has provided an amazing variety of reproduction in these tiny creatures.

Some protozoans are able to complete a life cycle in a very short time. Some paramecium can divide two or three times in a day. Many new living organisms are produced in this way.



| A protozoan "budding"

Write the correct letter and answer on the blank.

1.22 There are more than _____ different kinds of protozoans.

a. 1,000 b. 10,000 c. 30,000

1.23 An amoeba moves by means of _____ .

a. osmosis b. tiny hairs c. a "false foot"

1.24 A paramecium moves by means of _____ .

a. reproduction b. tiny hairs c. feet

1.25 Protozoans take in food through their _____ .

a. eyes b. cell membrane c. nucleus

1.26 Protozoans breathe by taking in _____ .

a. oxygen b. carbon dioxide c. air

1.27 Reproduction occurs in most protozoans through _____ .

a. budding b. sexual reproduction c. mitosis

LOOK IT UP: God has made a great variety of protozoans. Use the library or the Internet to find information about a protozoan type other than the amoeba or paramecium. Find out about the structure and the means of reproduction of the protozoan that you choose. Write your findings on the following lines:

PROTOZOAN NAME:_____

1.28 Structure:

_____

_____

_____

_____

_____

1.29 Reproduction:

_____

_____

_____

_____

Teacher check:

Initials _____ Date _____

Egg-Laying Invertebrates

Invertebrates are animals that do not have a backbone. Many kinds of invertebrates lay eggs outside the female's body during part of the life cycle. Among these are insects, worms, and **mollusks**. However, all of these invertebrates are different in many ways. Their structures are very different, and sometimes their means of reproduction differ. Their life cycles may be different in some ways. In the remainder of this section, we will examine each of these three types of egg-laying invertebrates: insects, worms, and mollusks.

Insects. Insects can be found all over the world. Some insects live in the cold Arctic regions. Other insects can be found in the hot desert places. Many insects make their homes near the water. Still others travel from one place to another during their lifetimes.

God has created a great variety of insects. Yet they are all small, six-legged creatures. Of the total one and a half million kinds of animals that scientists have named and classified, about one million are insects. Even within insect groups that have similar characteristics, there are many varieties. For instance, if you see two differently colored butterflies, you are probably seeing members of two different butterfly species.

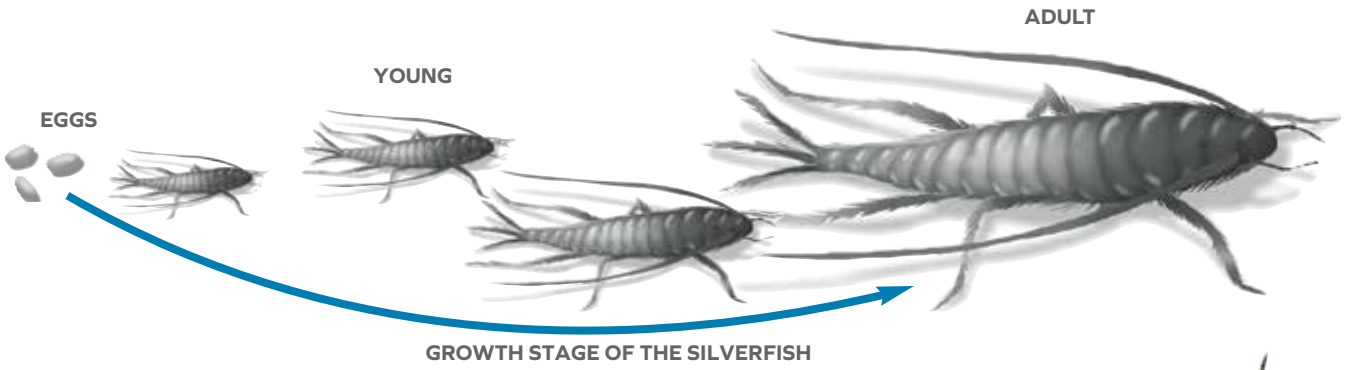
Color, shape, and size are often differences among the various insect species; however, insects are alike in some ways. All adult insects have six legs. Most adult insects have three body sections. Insect bodies are covered with a hard skeleton.

The life cycle of insects begins with eggs. Most insects need to have the female's eggs fertilized by sperm from the male insect. The female forms eggs in the ovaries. The sperm is produced in **testes** at the rear of the male's body. As the male and female mate, sperm is left in a special part of the female body. The eggs are fertilized by the stored sperm at the time the female begins to lay eggs outside her body.

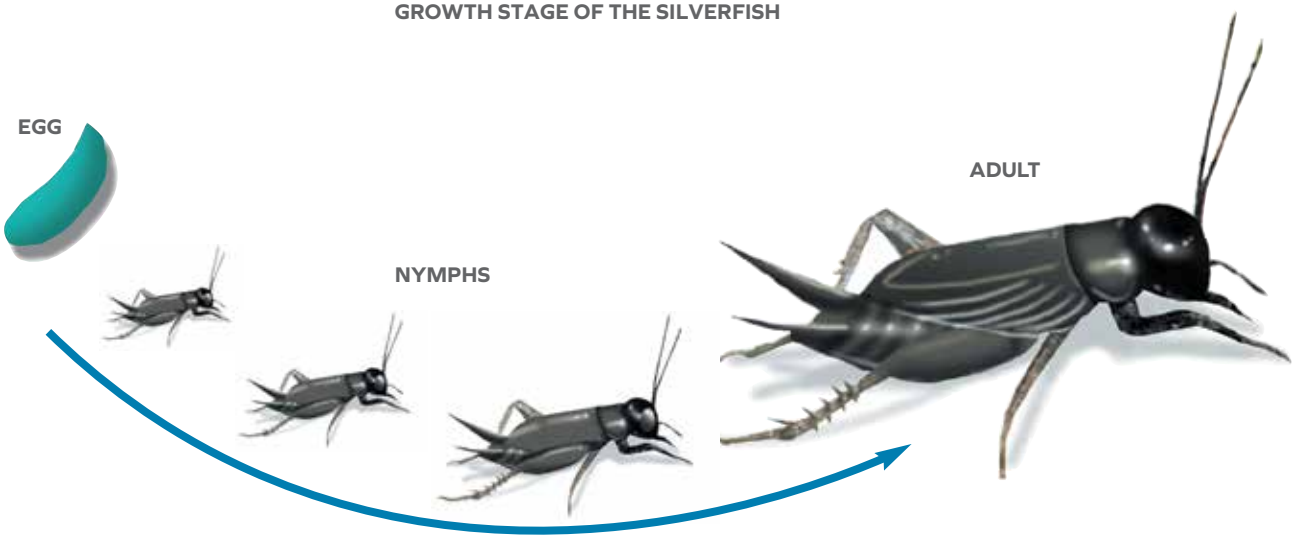
Female insects lay their fertilized eggs in different places. Some female insects place their eggs on leaves. Others lay their eggs in the ground. Certain female wasps lay eggs in other animals. Bees and other insects build cases for their eggs. The egg sizes and shapes vary as much as the parent insects do.

The growth stage of the insect life cycle varies from one insect species to another. The silverfish, cricket, and housefly all come through their growth stages in different ways. We will describe the growth stages of each one of these three insects as examples of the main ways that insects grow during the growth stage of the life cycle.

| After a queen bee lays eggs in the empty cells, the worker bees cap and feed the babies until they hatch



GROWTH STAGE OF THE SILVERFISH



GROWTH STAGE OF THE CRIKET

A few types of insects hatch from an egg into a tiny copy of the parent. The main change during the growth stage is the change in size. The silverfish is one insect that develops during the growth stage in this way.

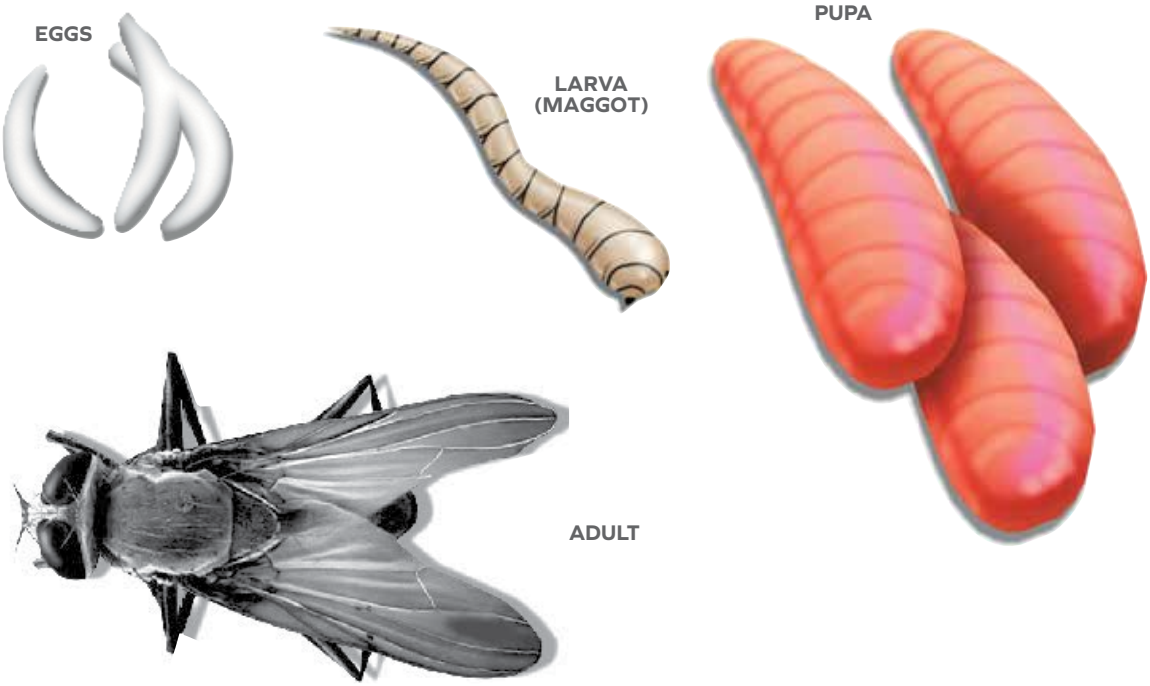
Many insects go through the *nymph* form in the growth stage. Crickets are examples of insects that use this form of growth. The newly hatched cricket looks nearly like its parent. However, it does not have wings. The young cricket also does not have reproductive organs at first. It is called a *nymph* at this growth stage. As the cricket nymph grows, it gets larger. Wings begin growing. Reproductive organs develop. Finally, at the end of the growth stage, its wings and reproductive organs are fully developed, and it enters adulthood.

The housefly is an example of a complex insect growth stage. The fly hatches into a worm-like creature called a larva. The fly larva is also called a **maggot**. The larva (or maggot) begins to eat soon after hatching. As the larva grows, its hard skin becomes too small. The larva sheds the skin and continues to grow. When the fly larva is developed fully, it changes into a pupa. The pupa moves very little. After several days, the pupa changes into an adult housefly.

The larva of each insect that goes through a complex growth stage can be identified. Color, size, and shape are ways that you can tell a difference between larvae. Some larvae are known as caterpillars. Grubs and maggots are other types of larvae.

When an insect reaches the adult stage, it is fully developed and ready to reproduce. Male and female adult insects mate. Eggs are fertilized and laid. The life cycle continues.

HOUSEFLY



Match these items.

1.30 _____ It goes through a pupa form.

1.31 _____ When it is hatched, it looks like a tiny copy of the parent.

1.32 _____ It has a larva form.

1.33 _____ When it is hatched, it doesn't look like the parent.

1.34 _____ It goes through a nymph form.

1.35 _____ When it is hatched, it looks like a copy of the parent without wings.

a. housefly
b. silverfish
c. cricket

Complete these statements.

1.36 Scientists have named and classified about _____ different kinds of insects.

1.37 The sperm is produced in the _____ of male insects.

1.38 The eggs are produced in the _____ of female insects.

1.39 A maggot is a fly _____ .

EXPERIMENT 503.A
MEALWORM OBSERVATION

View 503 Mealworm Observation: Grade 5 Science experiments video

You will observe the development of a small larva called a mealworm into an adult grain beetle over several weeks. As the animal grows and develops, you will observe and record what you see.

These supplies are needed:

baby food jar or canning jar
magnifying glass
bran flakes or oatmeal
mealworm
potato
knife

Follow these directions carefully. Place a check mark in the box as you complete each step.

- ☐ **1.** Obtain a healthy mealworm. These can normally be bought at local pet stores.
- ☐ **2.** Pour some bran flakes or oatmeal into a jar. (Less than half a jar of flakes is enough.)
- ☐ **3.** Cut a small piece off the potato. Place it in the jar for dampness. *You will need to replace the piece of potato each week so that it doesn't rot or get dry.*
- ☐ **4.** Place the mealworm inside the jar. It will be the mealworm's home for several weeks!
- ☐ **5.** Have your teacher help you make a small hole in the jar lid so that the mealworm can breathe. Loosely place the lid on the jar.
- ☐ **6.** Write your name on the jar.
- ☐ **7.** Put the mealworm jar in a warm, dark, and safe place. Bring it out only when you are observing the mealworm.

1.40 Draw a picture of the mealworm in the space below. Use the magnifying glass to help you see the features of the mealworm.

1.41 Keep a diary of the mealworm's growth stage. Each day observe the mealworm and record your observations in your diary. Write about the changes the mealworm is going through. This observation and recording should only take you a few minutes each day. You should continue working in this LIFEPAC after each day's observation.

1.42 When a big change occurs in your mealworm, draw it in this space below. Be sure to record the date. There may be several drawings recorded here, so be sure to leave room for several drawings or you may use a separate sheet of paper.

Answer these questions after the insect becomes an adult.

1.43 What life stages did you observe? _____

_____

_____

1.44 What do you expect to happen next in the life of the insect? _____

_____

_____

_____

_____

Teacher check:

Initials _____ Date _____

LOOK IT UP: Use the library or the Internet to help you answer the following questions and complete this activity.

1.45 Why is a spider not considered an insect? _____

_____

_____

_____

_____

1.46 Explain the stages of a spider life cycle. _____

_____

_____

1.47 How does the spider life cycle compare with the insect life cycles? _____

_____

_____

1.48 Choose an unusual insect to study. Write a report about it on a separate piece of paper. Include information about the insect's life cycle. When finished share your report with a friend and with your teacher or parent.

Friend's name: _____

Teacher check:

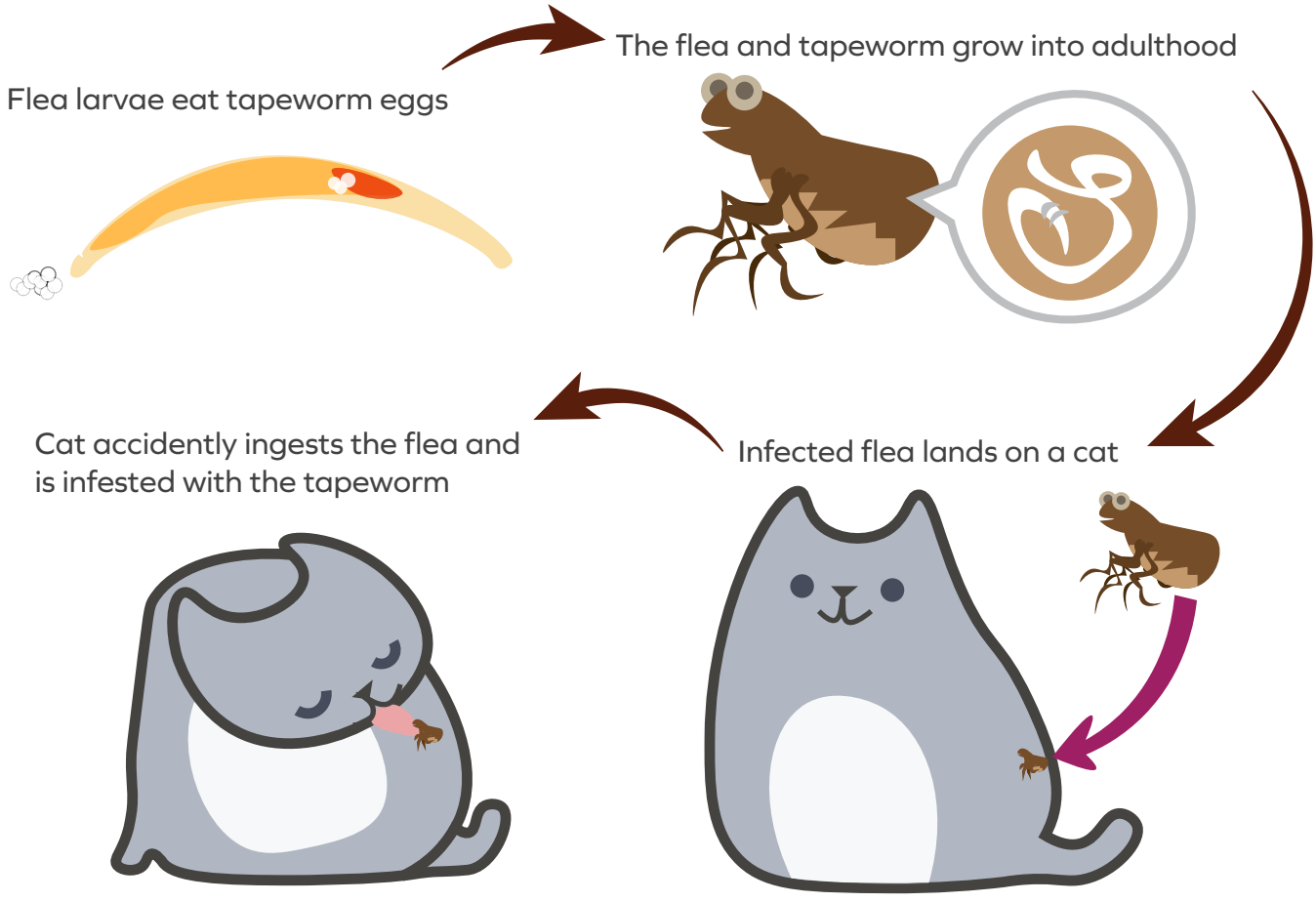
Initials _____ Date _____

Worms. Worms are animals that have soft, slender bodies and no backbone or legs. There are thousands of different kinds of worms. The largest worms are several feet long, and the smallest ones cannot be seen without a microscope.

Worms have no outside covers or bones to give them protection. Since worms have no protective structures, they live in places that are safer for them. Most of their lives are spent under the ground, in water, or inside other animals.

The larvae of some insects sometimes look like worms, but they are not really worms. There are big differences in the life cycles of real worms and the larvae of insects. Larvae will change into adult insects sometime during the life cycle. The adult insects no longer look like worms. Worms will stay worms all their lives. The adult worms can reproduce. Insect larvae cannot reproduce.

The most commonly known worm is the earthworm. **Flukes**, flatworms, roundworms, tapeworms, and leeches are other types of worms. Most of these worms have similar types of life cycles. However, some life cycles of worms cannot be completed unless the worms are located in the right place. The need for the right place to live is especially important to worms who live in other animals. These worms that live in other animals are known as **parasites**. The animal where the parasite lives is called the **host**.



The worm life cycle is fairly simple. It begins when the egg is fertilized by the sperm. Most species have male worms and female worms. They must mate for fertilization to take place.

Some kinds of worms have both male and female parts rather than being either male or female worms. The earthworm has this kind of structure. Yet, two earthworms are needed for mating. One worm's male part releases sperm into another worm's female part. Soon afterward, the egg case is released. Fertilization occurs in the case.

During the growth stage, some worms appear very much like the parent worms. However, some worms are hatched as larvae that do not look much like the parent worms. Most of these larvae need to find the right host or they will quickly die.

An example of a parasite worm life cycle involves the common house cat. Perhaps you have heard of a pet cat that has had worms. The cat is likely a host for parasite tapeworms. The cat did not get the worms by eating them directly. The hosts for the tapeworm larvae are usually fleas. The host fleas are infested with the tapeworm larvae.

When the cat cleans itself, it swallows the fleas. The tapeworm larvae on the fleas change into tiny tapeworms. They then live and grow as parasites in the intestines of the cat. The tapeworms produce eggs and fertilize them with sperm. The fertilized eggs are carried out of the cat's body as waste.

How do the fleas get the tapeworm larvae? Fleas feed on animal waste. If tapeworm eggs are in the waste, the eggs are brought into the fleas where they hatch into larvae. When the cat swallows the larvae-infested fleas, the tapeworm life cycle continues.

Answer these questions.

1.49 What are worms? _____

_____

_____

_____

_____

1.50 What are some differences between insect larvae and worms? _____

_____

_____

_____

1.51 What is a parasite?_____

_____

_____

1.52 Explain how common house cats get "worms." _____

_____

_____

_____

Examples of Mollusks

Snail

Squid

Clam

Mollusks. A *mollusk* is a soft-bodied invertebrate animal that has no bones. Most species of mollusks grow hard shells to protect themselves. Snails, clams, and oysters are examples of hard-shelled mollusks. **Squid** and **octopus** are examples of mollusks that do not have hard, outer shells for protection, although a squid does have a soft, inner shell in its body called a *pen*.

Mollusks live in most parts of the world. Wherever they live—in the water, the forests, or even the desert—they must keep their bodies moist to remain alive. Mollusks make up the largest group of water animals. Mollusks that live mostly in the water breathe through **gills**. They also move by means of a foot. There are about 50,000 kinds of living mollusks, with about 1,000 new kinds being discovered every year.

Most mollusks have similar life cycles. The cycle begins when the female's eggs are fertilized by the male's sperm. In some mollusks, fertilization takes place inside the female's body. Other mollusks lay eggs first, and then the eggs are fertilized by the sperm outside the female's body.

Mollusk eggs are in small cases when they are laid. Most eggs hatch into larvae while they are still inside the cases. This stage has two types of larvae. Some types of larvae come out of the cases and find a plant or animal host. Other mollusk larvae stay in the cases and come out as young adults. Shells are sometimes grown by mollusk larvae, but mollusks grow their main shells during their adult stage.

Answer these questions.

1.53 What are mollusks? _____

_____

_____

1.54 How are the life cycles of mollusks and insects alike? _____

_____

_____

1.55 How are the life cycles of mollusks and insects different? _____

_____

_____

1.56 At what point during the life cycle could some mollusks be considered parasites?

_____

_____

_____

Complete this crossword puzzle.

1.57

Across

b. A group of soft-bodied animals. Most have shells.

e. An animal that lives on or in other animals.

i. The part of the male animal that produces sperm.

k. All animal species have a life _____ .

m. The form some insects go through during which there is not much movement.

Down

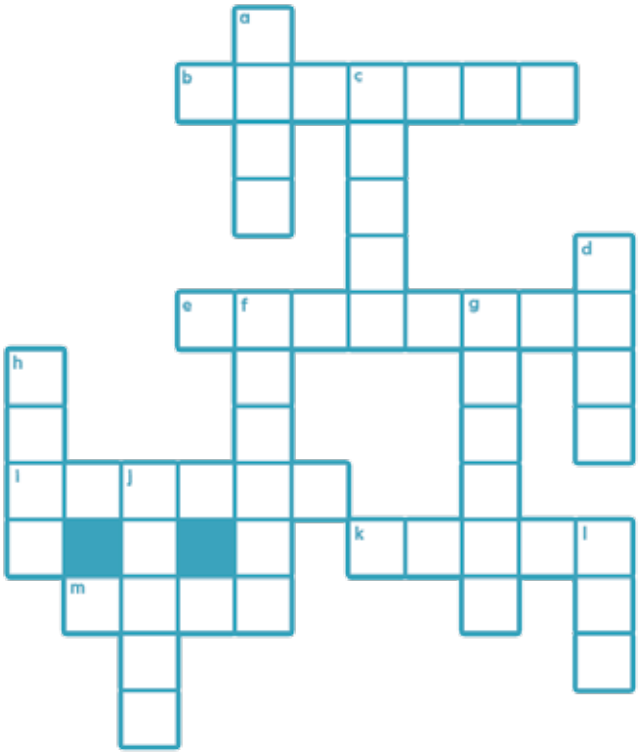
a. A long, thin, soft-bodied animal.

c. The form some insects go through when they look like worms.

d. The unit of life for all living things.

f. A simple, single-celled protozoan.

g. The housefly and crickets are members of this animal group.



h. What some animals do so that the sperm will reach the egg.

j. A mollusk without a hard, outer shell.

l. The female produces this in her ovaries.

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, 3 points).

1.01 _____ The body has no regular shape.

1.02 _____ Adult grows a hard shell.

1.03 _____ Adult is long, thin, and soft.

1.04 _____ Adult has six legs.

1.05 _____ Some have a pupa form.

1.06 _____ One cell. Adult has a regular shape.

1.07 _____ Many are parasites during growth and adult stages.

1.08 _____ Adult has gills.

1.09 _____ A nymph grows wings.

1.010 _____ About one million different kinds.

a. mollusk
b. worm
c. insect
d. amoeba
e. paramecium

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

1.011 _____ Amoebas grow from eggs.

1.012 _____ Embryos must search for their own food outside the egg.

1.013 _____ A tapeworm is a parasite.

1.014 _____ Some worms grow from larvae.

1.015 _____ Some insects do not go through the pupa and larva forms.

1.016 _____ Sperm is produced in the testes of an animal.

1.017 _____ Eggs must be fertilized inside the female's body.

1.018 _____ A paramecium grows from a nymph.

1.019 _____ A spider is an insect.

1.020 _____ A larva sheds its skin as it grows.

Write the correct letter in each blank (each answer, 2 points).

1.021 The study of animals is called _____ .

a. botany b. zoology c. microbiology

1.022 Animals that eat only plants are called _____ .

a. carnivores b. herbivores c. omnivores

1.023 A life cycle can be completed in less than a day by _____ .

a. worms b. mollusks c. parameciums

1.024 A _____ looks like the parent, but doesn't have wings or reproductive organs.

a. nymph b. larva c. pupa

1.025 A parasite _____ .

a. lives alone
b. eats mostly blood
c. lives in or on other animals

1.026 An animal without a backbone is called _____ .

a. a weak animal b. a vertebrate c. an invertebrate

1.027 An egg cell is made fertile by _____ .

a. mitosis b. a sperm cell c. an amoeba

1.028 Maggot is another name for _____ .

a. a fly larva b. nymph c. pupa

1.029 An invertebrate that has both male and female parts is the _____ .

a. larva b. paramecium c. earthworm

1.030 Animals that have six legs are _____ .

a. spiders b. vertebrates c. insects

Put these events of a life cycle in proper order (each event, 3 points).

wings grow	egg is laid	an egg cell is fertilized
adulthood	nymph is hatched from egg	

1.031 _____

1.032 _____

1.033 _____

1.034 _____

1.035 _____

Complete this activity (this answer, 5 points).

1.036 Describe the life cycle of a mollusk.

_____

_____

_____

_____

_____

Teacher check: Initials _____

Score _____ Date _____

80/100

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