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Life Sciences



Parasitic LIFE

by Sam Brelsfoard



Genre	Comprehension Skill	Text Features	Science Content
Nonfiction	Follow Instructions	<ul style="list-style-type: none">• Labels• Text Boxes• Diagrams• Glossary	The Roles of Living Things

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Vocabulary

carnivore
consumer
decomposer
ecosystem
food chain
food web
herbivore
microorganism
omnivore
producer

Extended Vocabulary

ectoparasite
endoparasite
flagella
parasitoid
symbiotic
vector

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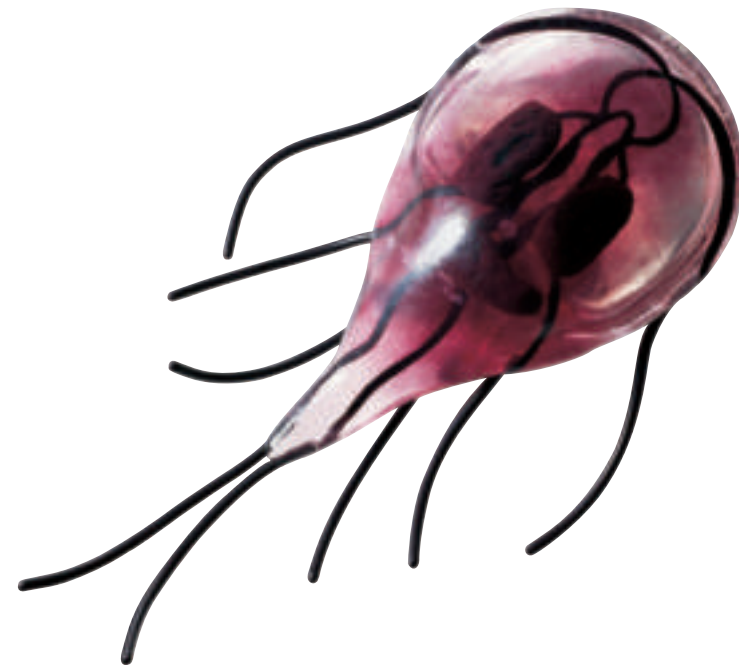
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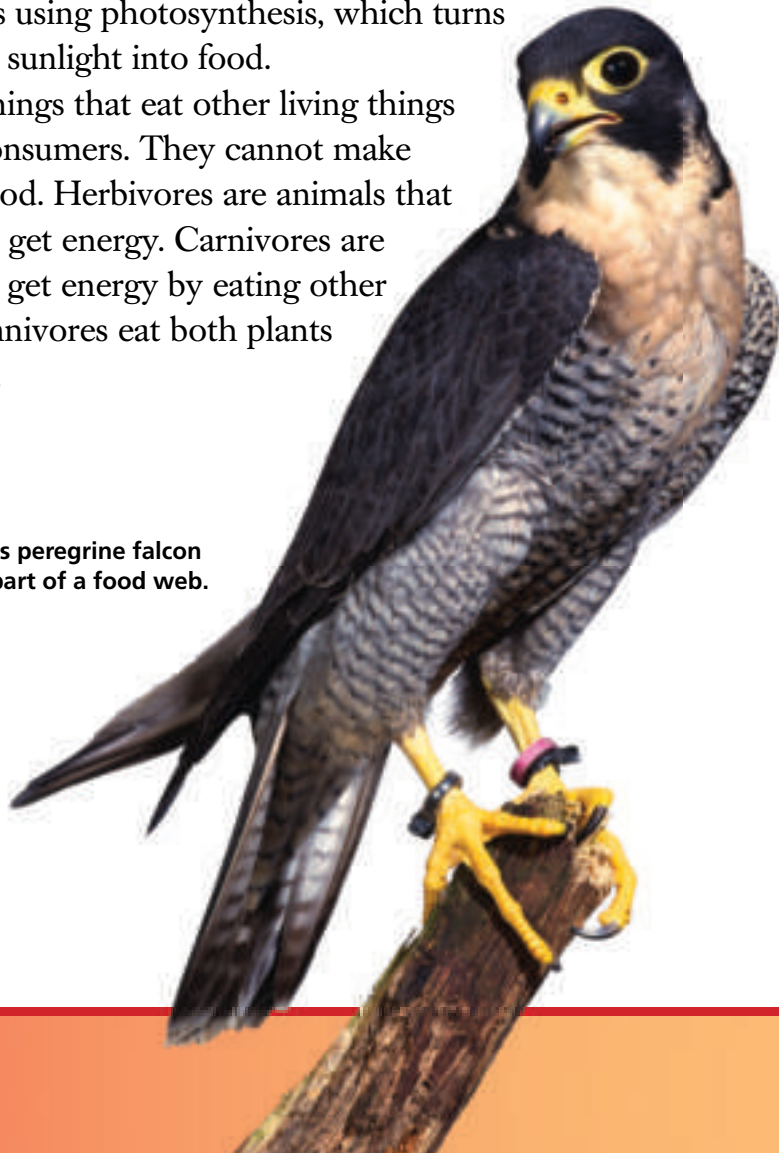
What You Already Know

An ecosystem is all the living and nonliving things in an environment and the many ways they interact. Living things in an ecosystem have many needs. But more than anything else, they need energy.

Energy in an ecosystem comes from producers. Plants are called producers because they produce their own food. They do this using photosynthesis, which turns energy from sunlight into food.

Living things that eat other living things are called consumers. They cannot make their own food. Herbivores are animals that eat plants to get energy. Carnivores are animals that get energy by eating other animals. Omnivores eat both plants and animals.

This peregrine falcon is part of a food web.



When living things die or leave wastes, organisms called decomposers break down the dead material or wastes and take in the energy. Many decomposers are microorganisms, or living things too small to see without a microscope.

In a food chain, animals transfer energy by eating and being eaten. Producers are at the beginning of a food chain. Animals that eat producers are next. Animals that eat those animals, called predators, are the next link in the food chain. Animals at the top of the food chain have no predators.

Most ecosystems are better described by a food web. A food web is a system of overlapping food chains. Energy and matter flow through many different branches in a food web. Every organism in a food web depends on every other organism.

Some organisms in ecosystems are parasites and some are hosts. The relationship between parasite and host can have important effects on environments. Parasites have an important role in a balanced ecosystem.

Fleas are parasites.





Introduction

A parasite is an organism that lives in or on a host organism. It often harms the host. A parasite's goals are to survive and to reproduce. Parasites can be found almost everywhere.

There are many different kinds of parasites. They can live on the inside or outside of the host. Most parasites are harmful. But in some cases, such as leeches, parasites have been found to have helpful medical uses.



Leech



Parasitic relationships are different from symbiotic relationships in an important way. In a symbiotic relationship, both organisms benefit. In a parasitic relationship, only the parasite benefits.



Parasites?

The oxpecker and the buffalo have a symbiotic relationship. The oxpecker eats ticks, fleas, and insects that are on the buffalo. This, in turn, keeps the buffalo clean.



Oxpecker and buffalo

Vampire bats have parasitic relationships with other creatures. They drink the blood of other animals. These bats often drink blood without disturbing the other creatures.



Vampire bat





Ectoparasites

An ectoparasite is a parasite that lives on the outside of a host. Ticks, fleas, lice, and mites are ectoparasites. These kinds of parasites typically feed on the blood or skin of their host. Most ectoparasites have adapted to life outside their host in a variety of ways. Usually their legs are extremely strong. Their short bodies lie flat and tightly grip the skin of their host so they do not fall off.

An ectoparasite such as a flea spends nearly its entire life on its host. It feeds on its host, and then it lays its eggs. The eggs hatch and mature, and the cycle starts again.

A flea is an ectoparasite.

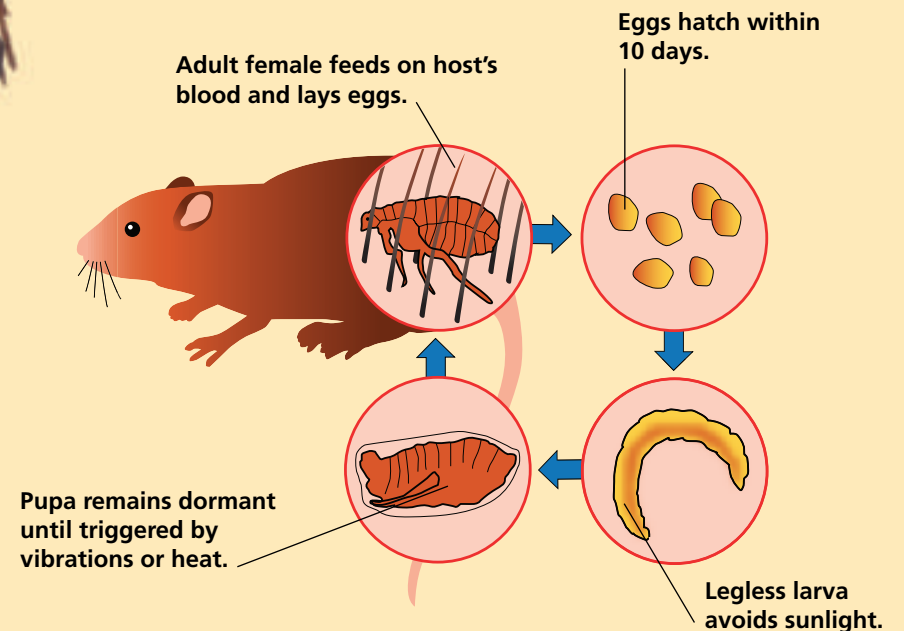


One ectoparasite sucks the sap of hemlock trees. This parasite is called the hemlock woolly adelgid. The adelgid drinking the sap of a tree is similar to a flea drinking the blood of an animal.



The Life Cycle of a Flea

A flea lives on a host during the adult stage, which is often most of its life.





The itch mite is an ectoparasite that lives in the skin of its host. It can cause a disease called scabies. Itch mites are different from most ectoparasites. They lay their eggs inside the host. They do this by first burrowing under the skin, then laying their eggs.

Spider mites are also ectoparasites. They spin webs on the underside of the leaves of plants and trees. These mites live on the plants' nutrient-rich juices. The mites will reproduce and live on a plant until the plant has no nutrients left.



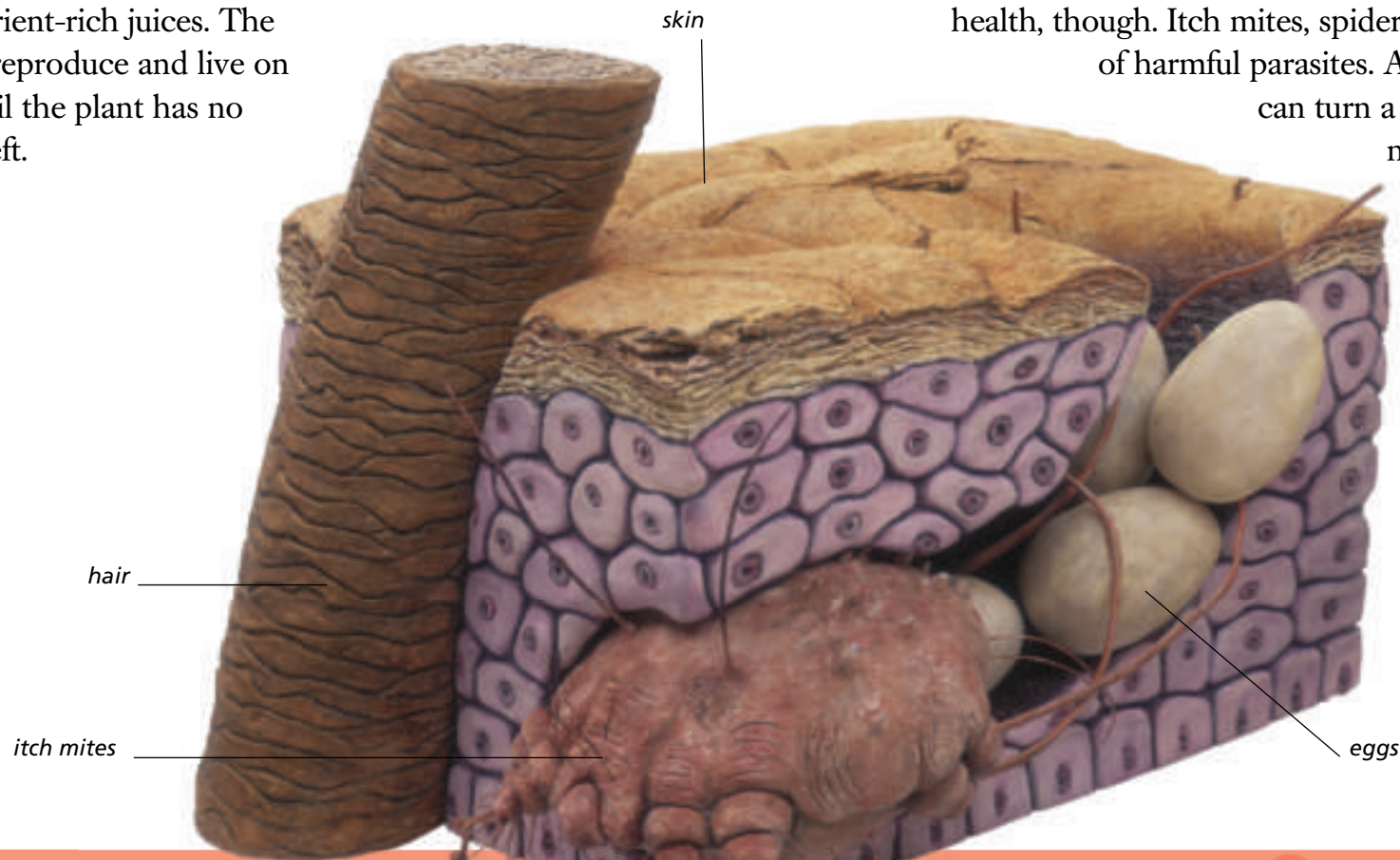
Itch mites burrow under skin.



Ticks are another example of ectoparasites. They feed on the blood of birds, reptiles, and mammals. A tick has mouth parts that are like beaks. These parts help it feed. A tick will wait on a blade of grass. When a potential host approaches, the tick grabs on and attaches itself to any part of the skin it can.

Leeches, even though they are parasites, have been found to be useful tools in medicine. A leech's saliva contains a chemical that stops blood from clotting. A leech can help in surgery by removing pooling blood and helping to prevent a wound from clotting too quickly.

Many parasites are known to be harmful to their host's health, though. Itch mites, spider mites, and ticks are examples of harmful parasites. A colony of spider mites can turn a perfectly healthy plant into nothing more than a twig.



After burrowing, itch mites lay their eggs under the surface of their host's skin.

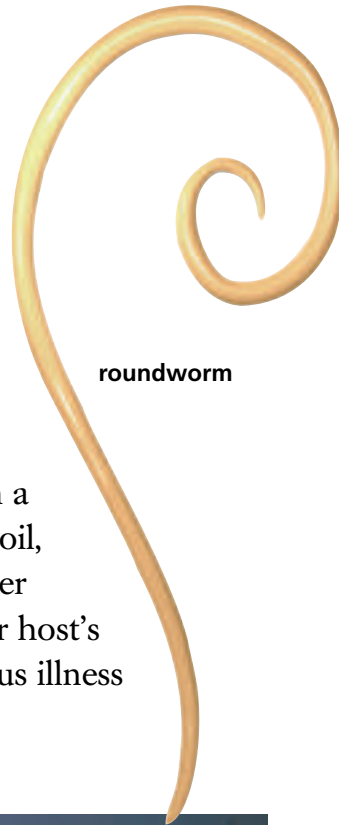




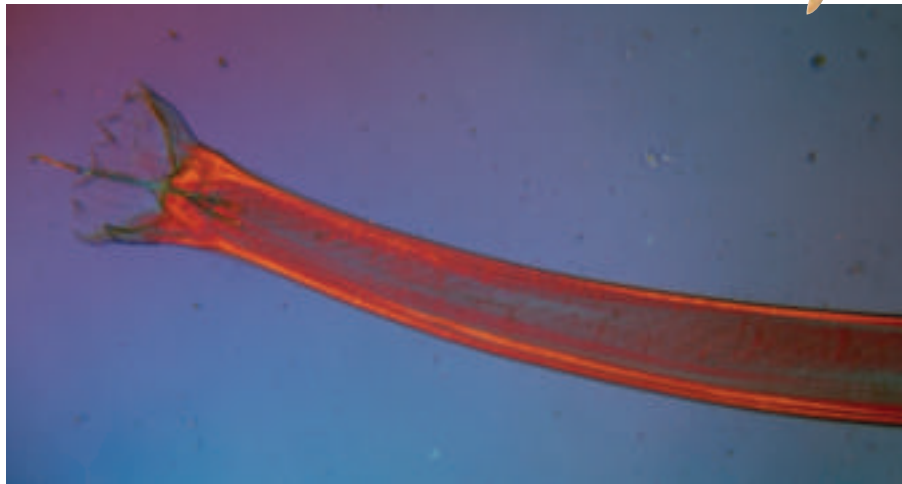
Endoparasites

An endoparasite is a parasite that lives inside the body of its host. Flatworms, such as flukes and tapeworms, are common endoparasites. Roundworms, such as pinworms and hookworms, are also endoparasites. Many endoparasites spend their entire lives inside their host.

Hookworms are a kind of roundworm. They hatch from eggs laid in the soil. When a barefoot person or an animal walks on the soil, hookworms can break through the skin. After about a week, the hookworms travel to their host's small intestine. Hookworms can cause serious illness in their host.



roundworm



male hookworm



Trichinella roundworms live in the intestines of some mammals. The host has eaten raw or undercooked meat that contains trichinella larvae.

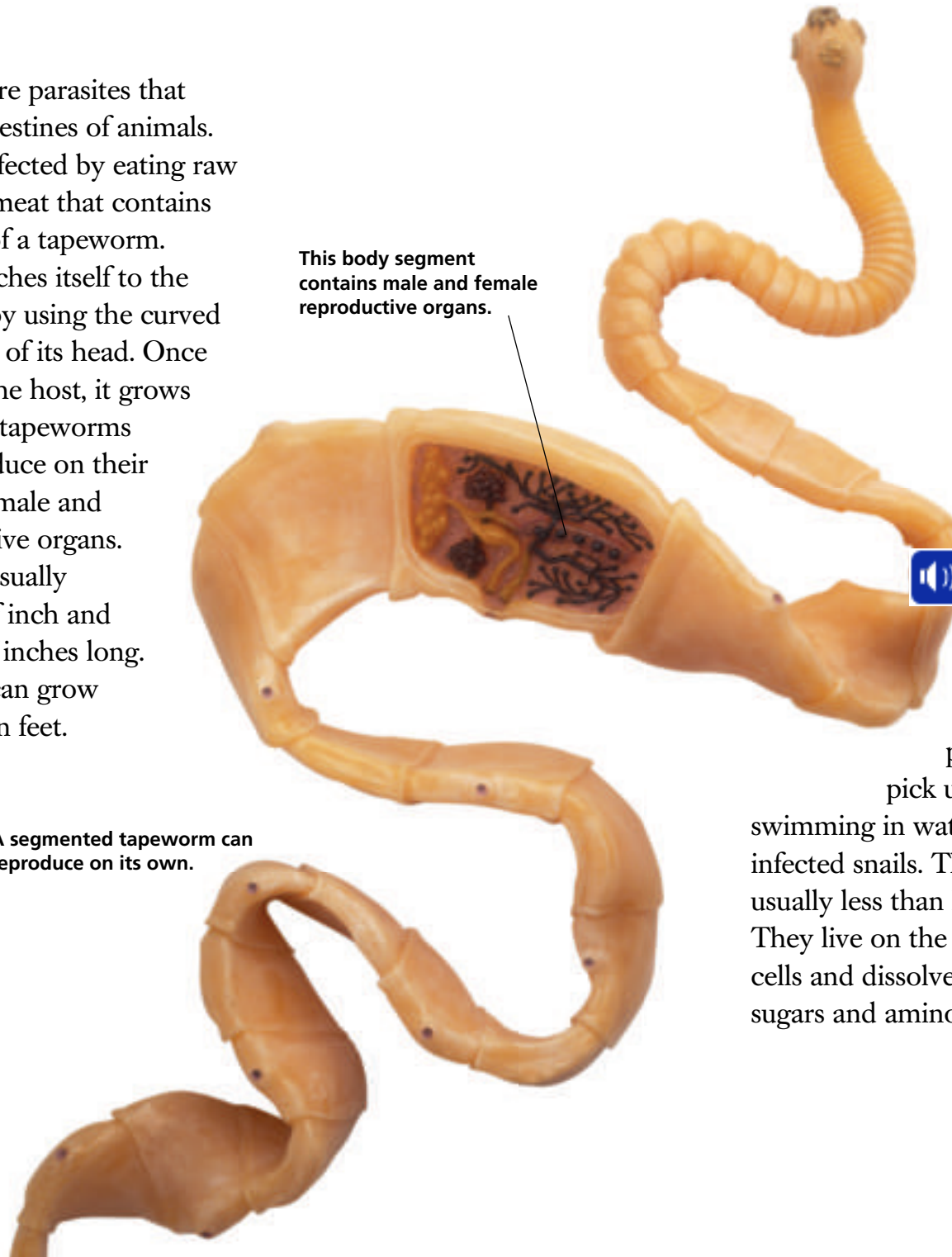




Tapeworms are parasites that can live in the intestines of animals. Often a host is infected by eating raw or undercooked meat that contains the young form of a tapeworm. A tapeworm attaches itself to the host's intestines by using the curved spines on the top of its head. Once it is attached to the host, it grows a long tail. Some tapeworms are able to reproduce on their own. They have male and female reproductive organs. Tapeworms are usually between one-half inch and one and one-half inches long. However, some can grow longer than fifteen feet.

A segmented tapeworm can reproduce on its own.

This body segment contains male and female reproductive organs.



curved spines

tapeworm head

sucker



The bilharzia (bil-HAHR-zee-uh) fluke is a parasitic flukeworm that causes the disease bilharzia. The worm starts its life as a larva inside snails that live in ponds. People often pick up the parasite while swimming in water that has the infected snails. The mature worms are usually less than half an inch long. They live on the host's red blood cells and dissolved nutrients, such as sugars and amino acids.



bilharzia fluke



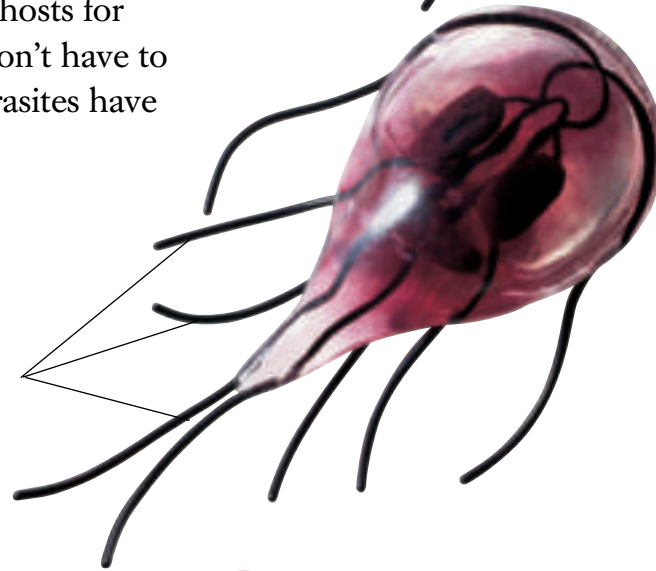
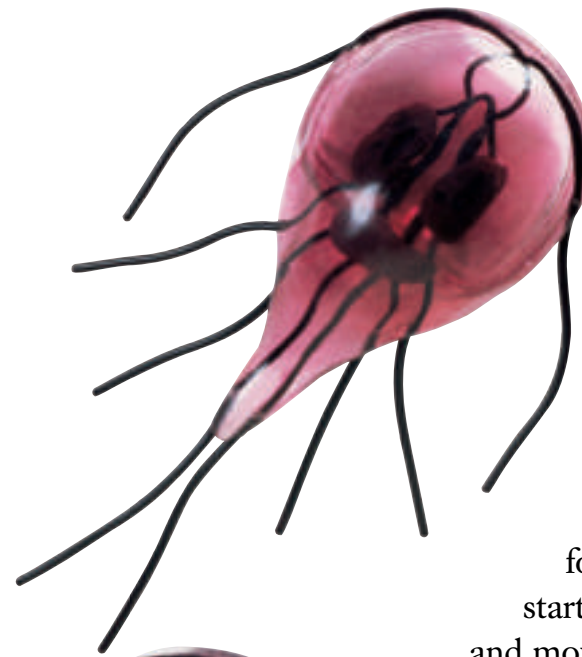


Microscopic Parasites

Microscopic parasites are too small to be seen by the naked eye. They are often found in contaminated water and uncooked food. The giardia lamblia protozoa (jee-AR-dee-uh LAM-blee-uh proh-tuh-ZOH-uh), which can cause intestinal disease, are often found in contaminated drinking water. When people and animals drink water that has giardia lamblia in it, the parasites enter their intestines. The parasites have a protective outer shell that allows them to live outside of their hosts for long periods of time. This means they don't have to stay in one host. The giardia lamblia parasites have long, threadlike structures called flagella (fluh-JEL-uh) that help them swim.

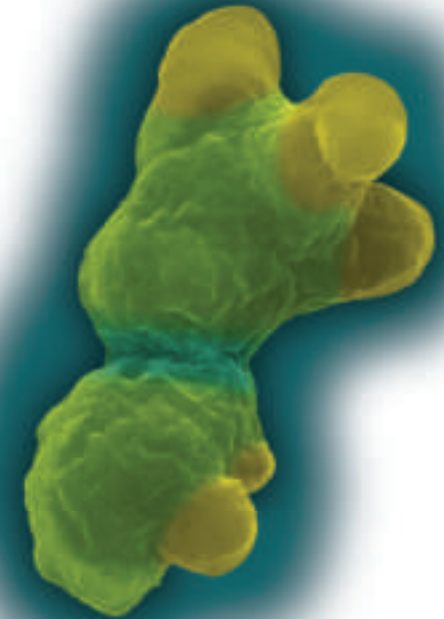
Giardia lamblia is protected by its outer shell. Its flagella help it move with ease.

flagella



The entamoeba histolytica (en-tuh-MEE-buh his-toh-LI-ti-kuh) protozoa are microscopic parasites similar to the giardia lamblia. These parasites can survive outside their hosts in water and soil. Humans become infected by consuming contaminated food or water. The entamoeba protozoa start in the small intestine. Then they mature and move to the large intestine, where they burrow into the lining. Once they are in the large intestine, they reproduce by division.

entamoeba histolytica protozoa





Parasite Carriers

Some parasites find their hosts with the help of insects and other creatures. The parasites travel inside insects, letting the insects take them to their hosts. When insects are used this way, they are called vectors.

Tsetse (TSEE-tsee) are flies that can be vectors of a parasite that causes sleeping sickness. Tsetse are found only in certain parts of Africa, and they usually feed on humans only by accident. Still, they are a way for parasites to find their hosts.

This tsetse is swollen with blood from feeding.



trypanosoma parasites



One type of assassin bug, also known as a kissing bug, feeds only on the blood of mammals. Kissing bugs come out at night and pierce their hosts' eyelids, ears, or lips in order to feed. Kissing bugs sometimes carry the trypanosoma (tri-pan-uh-SOH-muh) parasite, which causes Chagas' disease. Chagas' disease is an illness that causes a mild fever. Sometimes Chagas' disease develops into far more serious problems.

The kissing bug can transmit the parasite that causes Chagas' disease.





Mosquitoes And Malaria

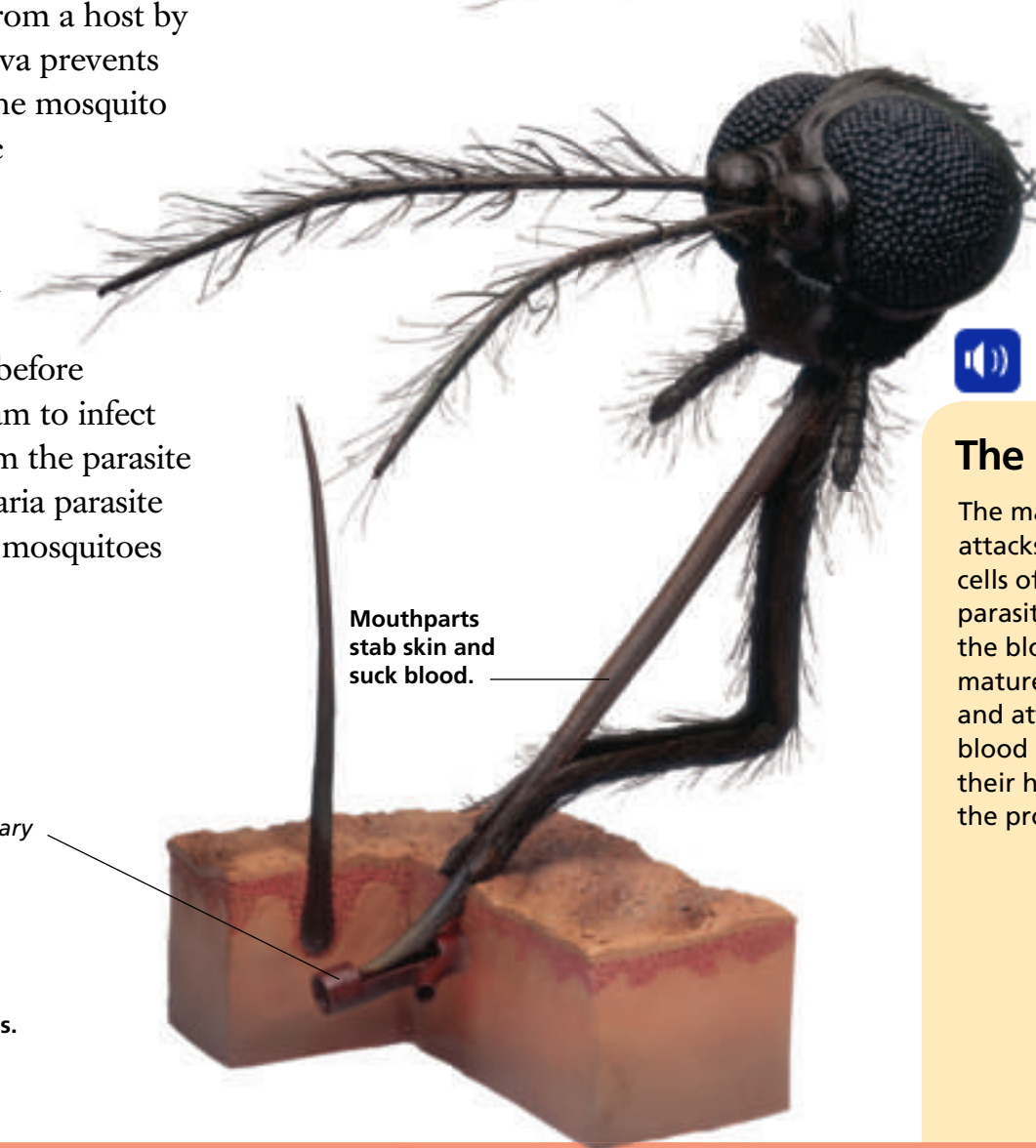
Mosquitoes are also vectors for parasites. A mosquito draws blood from a host by injecting its saliva. The saliva prevents the blood from clotting. The mosquito can also inject microscopic parasites, or sporozoites (spor-uh-ZOH-eyets), into the host. The parasites can penetrate the cells of the liver, where they multiply before returning to the bloodstream to infect blood cells. The toxins from the parasite make the host ill. The malaria parasite is one of the parasites that mosquitoes can carry.



mosquitoes



Sometimes symptoms of malaria can occur within ten days of being bitten. Other times, people do not realize they are sick for as long as four weeks after they were bitten. Symptoms of malaria include headache, muscle aches, tiredness, fever, and chills. If an infected person does not get treated right away, malaria can lead to kidney failure, seizures, mental confusion, and coma. Sometimes malaria is fatal. Mosquitoes that carry malaria tend to live in Africa, Asia, and Central and South America.



capillary

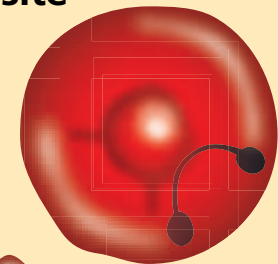
Mouthparts stab skin and suck blood.

When a mosquito sucks blood from a host, it can inject parasites.

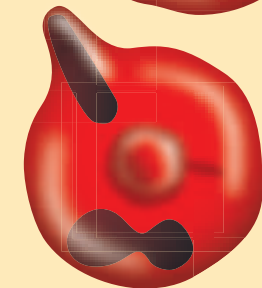


The Malaria Parasite

The malaria parasite attacks the red blood cells of its host. The parasites mature within the blood cells. Once mature, they burst out and attack other red blood cells, making their host sick in the process.



New parasites form inside human red blood cell.



New parasites mature and push out of cell.



New adult parasites emerge.

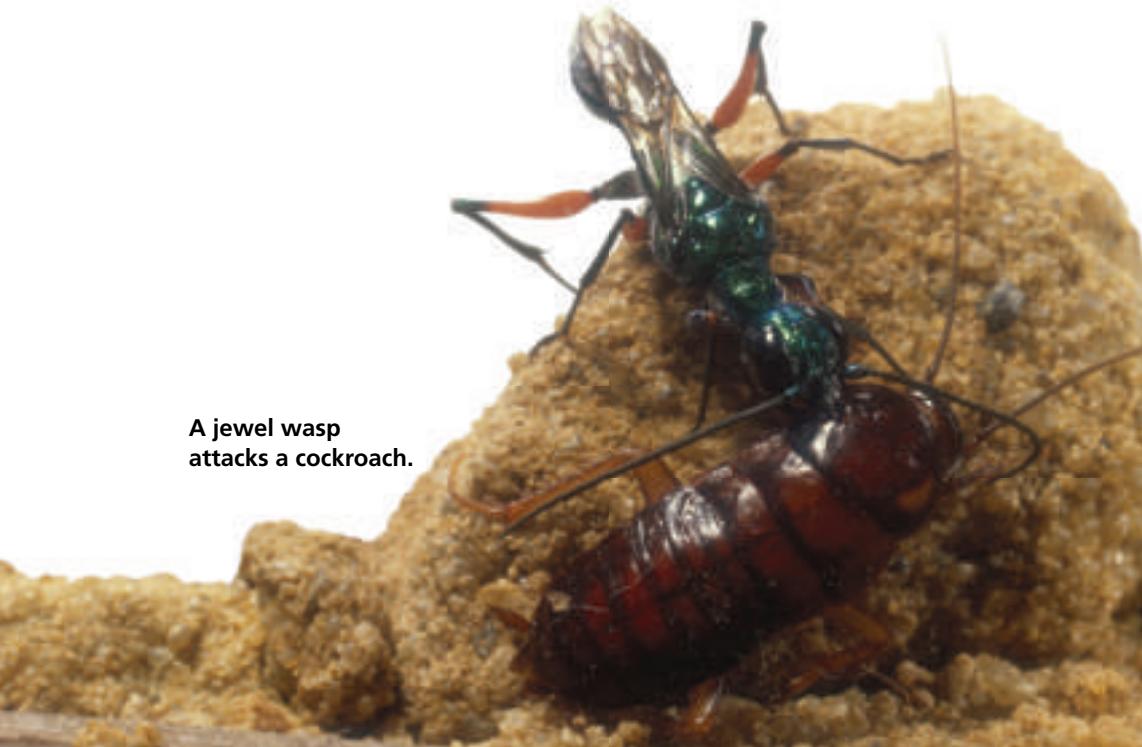




Parasitoids

Parasitoids (PAH-ruh-si-toids) are a kind of insect whose larvae are parasites that eventually kill their hosts. Often, parasitoids begin their lives as larvae on or in a host, living on the nutrients from the host. When the parasitoids mature, they leave their host and lead a nonparasitic life.

The jewel wasp is a parasitoid that is a parasite in the larval stage. Before an adult jewel wasp lays her egg, she attacks and paralyzes a cockroach. She then lays her egg on the cockroach and buries both in a hole. When the larva hatches, it feeds on the cockroach. The shell of the cockroach protects it until it develops into a fully formed wasp.



A jewel wasp attacks a cockroach.



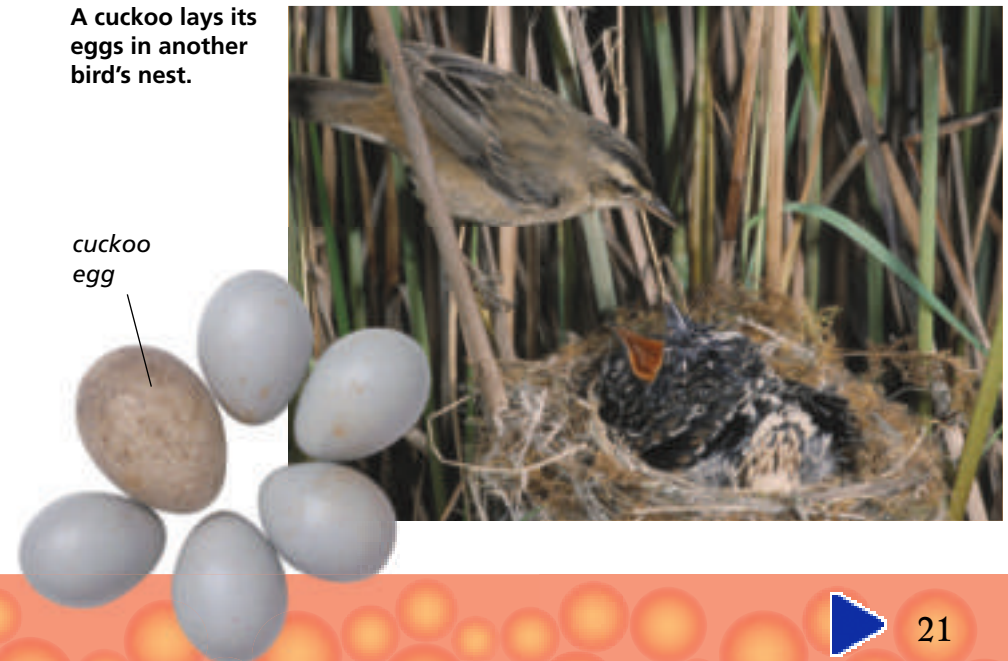
Ichneumon (ik-NOO-muhn) wasps are parasites that use different hosts at different stages in their lives. As larvae, the insects feed on the larvae and pupae of butterflies and moths. When mature, the wasps feed on the body fluids of larger hosts.

Cuckoos are brood parasites. They exhibit somewhat similar behavior to parasitoids. Cuckoos leave their eggs in other birds' nests to be raised by the other birds. Once hatched, the cuckoos compete for food with the other birds' young, eventually starving them.



An ichneumon wasp is laying eggs in a sawfly grub.

A cuckoo lays its eggs in another bird's nest.





Parasitic Plants And Fungi

Plants and fungi can be parasites too. Mistletoe, ivy, dodder, birch tree fungus, and strangler fig are all parasitic.

There are many types of fungi on Earth. Some fungi can cause growths on birch trees. Fungal growths can sometimes kill trees.

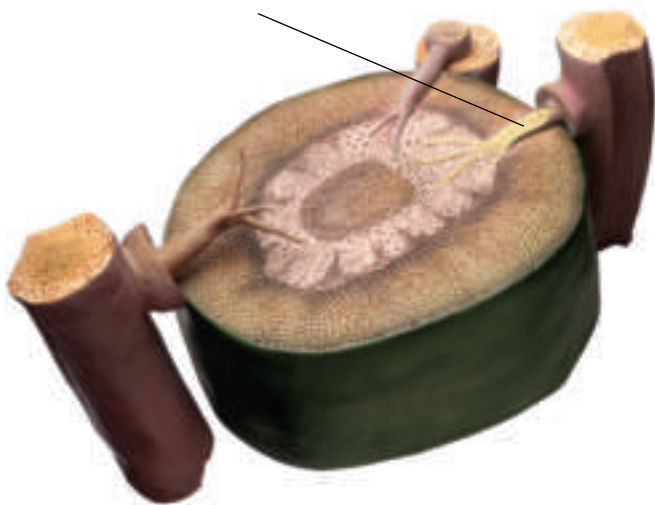
Dodder attaches itself to other plants and penetrates the host's tissue in order to absorb its nutrients.



Birch tree fungus



Threads grow out of dodder and push through the host plant's cells.



Dodder is a parasite in the morning-glory family of plants.



Many Parasites

Parasites exist in all forms of life. Ectoparasites, such as fleas and ticks, live outside of their host, while endoparasites, such as hookworms and flatworms, live inside. Microscopic parasites are the main causes of diseases such as malaria and sleeping sickness. Microscopic parasites can be found in contaminated food or water. Some parasites use vectors to find their hosts. Mosquitoes can be vectors for malaria parasites. A jewel wasp is an example of a parasitoid, an organism whose larvae act like parasites. Brood parasites, such as the cuckoo, use other animals to feed and raise their young.

Parasites play a vital role in ecosystems. Even though they can harm their hosts, parasites benefit ecosystems. They help to keep certain populations under control. Without parasites many ecosystems would not have the balance they need to remain healthy.



horse leech






Glossary

ectoparasite	a parasite that lives outside its host
endoparasite	a parasite that lives inside its host
flagella	long, threadlike structures that help an organism move
parasitoid	a kind of insect whose larvae are parasites that eventually kill their hosts
symbiotic	a relationship of mutual benefit or dependence
vector	an organism, such as a mosquito, that carries disease-causing microorganisms from one host to another

What did you learn?

1. How is a parasitic relationship different from a symbiotic relationship?
2. What are some examples of endoparasites?
3. What is a parasitoid?
4. **Writing in Science** Use an encyclopedia or other source from the library-media center to research a parasite mentioned in the book. Then write a paragraph about what you learned.
5.  **Follow Instructions** Write instructions for someone to follow on how to avoid some of the parasites described in this book.

