The American Cockroach

Slender, flat, and reddish brown, the American cockroach grows to be about 1 1/2 inches (four centimeters) long. Its flat body helps it to slip under rocks, crevices, and leaves, as well as floorboards and cabinets. Like many other cockroaches, the American cockroach has a pair of long, thin antennae extending from its head and a pair of thin, crinkly wings resting on its back. The American cockroach's wings are fully developed and enable this insect to fly. Some cockroaches have wings that are not developed enough to be used in flight.

In spite of its name, the American cockroach is not native to the United States. It is, however, common throughout many of the tropical countries of the world. It is particularly common around seaport towns and on ships. Like other cockroaches, the American cockroach is an omnivore, or animal that feeds on both meat and plants. In general, the majority of a cockroach's diet consists of plant matter, but dead animals, animal droppings, household foods, and wallpaper are also common in a cockroach's diet. As a nocturnal, or night-active, animal, the American cockroach spends its nights searching for food.

Like other cockroaches, the American cockroach is preyed upon by other insects, spiders, reptiles, and amphibians. It is also threatened by humans. Most humans do not like cockroaches because they contaminate, or spread germs, among household foods.
Like other insects, the American cockroach's body is divided into three segments, which are the head, thorax, or middle, and abdomen, or end part. During the mating cycle the female American cockroach carries her eggs in a pouch along her abdomen.

The mating process of the American cockroach begins with the female producing and releasing a chemical known as a pheromone. This chemical is released to help her attract a mate. Once the male has noticed the female, the two insects begin their courtship by touching each other's antennae. Eventually, the male American cockroach fertilizes the female's egg pouch. This egg pouch holds her eggs in a well-organized bundle. The bundle is neatly arranged in two rows within the pouch.

After the male fertilizes the eggs, the female releases them onto the ground. As they are being laid on the ground, a tough capsule, or ootheca, forms around them. This capsule protects the eggs during their 30- to 60-day development period. There are usually between five and 50 eggs within each ootheca.

Unlike the mature adult, the young American cockroach is a pale white. Although it resembles the adult in its body shape, its color does not change until the insect is a few hours old. The young American cockroach does not have wings until it has molted several times. Molting is a two-step process. First the insect grows a new, larger body beneath the outer layer of its current body, then the insect breaks free of the old body, to grow in the new one.

The American cockroach has an average life span of at least six months, but some American cockroaches have been kept alive in laboratories for as long as three years.

THINGS THAT GLOW (LX 800)

By Sharon Huntington

Caves full of stars, trees covered with flashing lights, and boats that leave a trail of light through dark waters. These sound like science fiction or movie special effects. They're really products of amazing tiny creatures that can glow in the dark.

Maybe you've seen little spots of light flitting through the air at night. These fireflies are the best-known group of glowing creatures. Sometimes called lightning bugs, they are really beetles with light organs under their tails. More than 1,900 kinds of fireflies produce their own light. They flash their lights on and off. Each kind uses it own special code. One firefly can recognize another of its own kind by the number of flashes, the color of the light, and the time between flashes.

Some fireflies "gang up" to get attention. In Thailand, Malaysia, Burma, and the Philippines, millions of male fireflies gather in trees. They all start flashing their lights at the same time. The tree looks like a big neon sign. This attracts female fireflies.

Some creatures glow for other reasons. The glowworm isn't really a worm It's a firefly in an early stage of development called the larval stage. Most adult fireflies never eat, because they did all their eating when they were larvae. The light from a larva's glowing body attracts tiny flies and mosquitoes for the larva to eat.

Many glowing creatures live in water. Anglerfish live deep in the ocean where sunlight never reaches. Some have a rod on their heads with a tip that glows in the dark. The anglerfish waves this "fishing rod" at its prey, then pulls the rod in to lure the prey closer. Like the glowworm, the anglerfish uses its light to catch its dinner.

Other fish use their lights for protection. Some squid that live in dark waters can eject a cloud of light to distract enemies. Lantern fish hide from enemies below them by producing light that matches the sunlight or moonlight coming through the water above.

Light produced by animals or fungi is not hot. It is called "cold light" or bioluminescence. "Bio" (BY-oh) means "living," and "luminescence" (LOO-muh-ness-uns) means "light." Creatures make the light by combining special substances in their bodies. In fireflies, a substance called luciferin (loo-SIF-uh-rin) reacts with oxygen when another substance, luciferase (loo-SIF-uh-raze), is present. Other creatures may use different substances, but the light is always made by a chemical reaction.

We have a pretty good idea why some living things produce light. For others, we can only guess. Bioluminescence isn't as mysterious as it used to be, but there is still much to learn about it - and many wonders to enjoy.

Source: *Christian Science Monitor*, 6/17/97, Vol. 89 Issue 141, p16, 1c

How Well I Know These Words

Student _____ **Title of Text** _____

Directions: Number the paragraphs in your text. Before reading the text, use the rubric key to indicate how well you know the meaning of each word. Write the appropriate number in Column 2. Be sure to work on your own. Next, get with a partner or small group and discuss each word. You may change your rubric number if you wish during your group time. In Column 3, write the numbers of all the paragraphs that contain each word. For example, if a word appears in three paragraphs, list each paragraph number. Your teacher will give you directions for Column 4. After the lesson, rate your knowledge of the word in Column 5.

RUBRIC	
1	**Don't Know at All**
2	**Seen or Heard but Don't Know Meaning**
3	**Think I Know the Meaning**
4	**Sure That I Know the Meaning**

Column 1 **Word**	*Column 2* **Rating Before**	*Column 3* **Paragraph #**	*Column 4* **Teacher will give directions.**	*Column 5* **Rating After**
antennae			Draw examples of an antennae	
native			Name of city student is native of	
omnivore			Different kinds of omnivores	
nocturnal			Animals that are nocturnal	
contaminate			Example of contamination	
preyed			Clues to meaning	
pheromone			Purpose of pheromone	
ootheca			Draw picture of ootheca	
molting			Description of molting	
thorax			Draw a picture of a thorax	

How Well I Know These Words

Student _____ **Title of Text** _____

Directions: Number the paragraphs in your text. Before reading the text, use the rubric key to indicate how well you know the meaning of each word. Write the appropriate number in Column 2. Be sure to work on your own. Next, get with a partner or small group and discuss each word. You may change your rubric number if you wish during your group time. In Column 3, write the numbers of all the paragraphs that contain each word. For example, if a word appears in three paragraphs, list each paragraph number. Your teacher will give you directions for Column 4. After the lesson, rate your knowledge of the word in Column 5.

RUBRIC	
1	**Don't Know at All**
2	**Seen or Heard but Don't Know Meaning**
3	**Think I Know the Meaning**
4	**Sure That I Know the Meaning**

Column 1 **Word**	***Column 2*** **Rating Before**	***Column 3*** **Paragraph #**	***Column 4*** **Teacher will give directions.**	***Column 5*** **Rating After**

The Forest's Larders

It is not only yew trees that form successful partnerships with fungi. Among the oldest and best-known symbioses around are the lichens. They are co-operative ventures between fungi and algae. And, besides being useful to each other, they-like the collaborations between fungi and yew trees-have their uses for mankind.

In the past, lichens have been employed for dyeing fabrics. More recently, conservationists and environmental watchdogs have used them to monitor air pollution. (The rates at which lichens grow, as well as the diversity of species in a particular area, depend sensitively on the level of gases such as sulphur dioxide.)

Now, it seems, lichens can serve as another useful environmental index: one that indicates whether a woodland is rich or poor in birds. Although the keen bird-watcher can judge how popular a forest is in the spring, when birds are singing to advertise their breeding territories, working out the avian population at other times of the year is tricky.

A group of Swedish biologists has found a novel way to do this using lichens. Roger Pettersson, of the Swedish University of Agricultural Sciences in Umea, and his colleagues reasoned that lichens are home to a wide variety of the sort of invertebrates that birds like to eat. So they set out to create an index of how bird-life varied with lichen-life.

They studied five natural and five managed forests. In each case, they compared invertebrate abundance on the branches of spruce trees. In managed forests, trees are felled when they are fully grown; in natural ones they are allowed to die of old age. It was already known that natural forests, with plenty of dead and decaying timber, are richer feeding spots for birds. This is because invertebrates such as beetles and mites spend much of their lives boring into dead wood to feed and lay eggs.

But the old wood of unmanaged forests is also the habitat of abundant lichens. And when Mr Pettersson's team looked at them it found three times as many spiders and eight times as many springtails (a type of primitive flightless insect) on spruce branches covered by lichens as on lichen-poor ones. Overall, invertebrates were five times more abundant where there were lichens to be found-an abundance that translated directly into an abundance of bird life. There are some obvious reasons why lichens are attractive to creepy-crawlies. Certain invertebrates, particularly lice, feed on them directly. Others, such as spiders, use them as hideouts. And many plant-eating insects use them as shelter for the resting stages in their life cycles.

But there is also a stranger reason. It is not only squirrels that squirrel food away for the winter. A number of species of small birds do so too (though they collect dead invertebrates , rather than nuts). Most of these birds use lichens to secrete their grub. So forests that provide these storage silos in abundance can sustain more birds than those that do not. No one, after all, would want to live in a house whose kitchens had no cupboards, would they?