

NATIONAL
GEOGRAPHIC
KIDS

EVERYTHING INSECTS

ALL THE
FACTS,
PHOTOS,
AND FUN
TO
MAKE YOU
BUZZ!

CARRIE GLEASON
WITH NATIONAL GEOGRAPHIC EXPLORER
DINO J. MARTINS



EVERYTHING INSECTS







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CARRIE GLEASON

With National Geographic Explorer DINO J. MARTINS

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The *Rhombodera basilis*, or shield mantis, is a species of mantis native to Asia. When threatened, it spreads its wings and forelegs as if ready for a fight.



The metallic-looking body of a cuckoo wasp is magnified in this extreme close-up photo. Also called jewel or emerald wasps, they lay their eggs in other insect nests, where their larvae eat the eggs of the other insects.



INTRODUCTION

THEY'RE EVERYWHERE: ON EVERY CONTINENT, IN EVERY COUNTRY

and every city, schoolyard, backyard, even in our homes. They live inside, outside, up in the sky, in trees and plants, and under the ground. They are so numerous that scientists say they outnumber humans by 20 million to one.

They are insects. Some are brightly colored, while others are dull. Some have venomous stings; others are harmless. But all together, insects are an incredible group of animals that has been around much longer than people, even since before the dinosaurs! Insects are one of nature's greatest successes, which may surprise you, given their small size. All over the world, whether people consider them pests or helpers, insects play a big role in the planet's well-being. Ancient cultures admired them, Native Americans made them the stuff of legends and, even today, people in many parts of the world depend on them for food and to pollinate plants and flowers.

With about one million known species of insects on Earth, we have a lot of ground to cover. It's time to discover what all the buzz is about as you learn EVERYTHING about insects!



EXPLORER'S CORNER

Hi! I'm Dino J. Martins.

I'm an entomologist—a scientist who studies insects. I do most of my work in Kenya. I work in different habitats, from the rain forests of western Kenya to the hot, dry deserts of Turkana in northern Kenya, and other places in East Africa. Working with farmers and kids, I teach the importance of insects as pollinators. Look for these Explorer's Corner boxes throughout the book, where I weigh in on how important insects are to our planet.





There are more than 20,000 different species of bees. One of the best known species, the honeybee, nests in colonies where workers feed the larvae.



1

**BRING ON THE
INSECTS!**

WHAT IS AN INSECT?

AH, OUR INSECT FRIENDS, THEY ARE HELPFUL (AND SOMETIMES HARMFUL).

They are also fun to watch, but can be creepy if they take you by surprise. The insect world is so diverse that it can be hard to determine what exactly is an insect.



ABDOMEN

HEAD

THORAX

BODY PARTS TELL THE STORY

All insect bodies are made up of three main parts: a head, a middle section called the thorax, and a rear section called the abdomen. All insects also have six legs. Many, but not all, insects have long, pointy sensors called antennae, plus one to two sets of wings. But that's where the similarities end.

WAIT ... WHAT ARE BUGS THEN?

Not all insects are bugs. But all bugs are insects. Sounds confusing, right? To keep it straight, remember that "true bugs" are a group of insects that have specialized mouthparts designed for sucking up liquid (usually the sap of a plant, but sometimes blood). Aphids, cicadas, and water bugs are some examples of true bugs.



CICADA

BUG BITE THERE ARE AN ESTIMATED 10 QUINTILLION (10,000,000,000,000,000) INSECTS ON EARTH AT ANY GIVEN TIME.



CATERPILLAR

Many young insects look nothing like how they will look as adults. In fact, some look like tiny worms—but they are not related to worms at all!



JUMPING SPIDER



WHAT ISN'T AN INSECT?

Spiders are often thought of as insects, but they're not insects at all. They belong to a group of animals called arachnids. Spiders have eight legs instead of six and they never have wings. Sometimes the name of a creature can cause confusion. Pill bugs, for example, are neither bugs nor insects. They belong to a group of animals called crustaceans, as do lobsters and crabs. Centipedes and millipedes, those fast-moving, multi-legged critters that sometimes skitter out of drainpipes, aren't insects either. They are myriapods. However, all these animals are closely related to insects: Insects, arachnids, crustaceans, and myriapods all belong to a bigger group called arthropods. All arthropods, insects included, have a hard outer shell called an exoskeleton.

By the Numbers

Insects are the largest group of animals on the planet. Here are the top five insect species by number.

500,000	species of beetles are known to insect scientists.
160,000	species of butterflies and moths flutter about the planet.
140,000	species of ants, bees, and wasps help tidy Earth and pollinate plants.
120,000	species of flies buzz around Earth.
90,000	species of true bugs have been identified by scientists.

INCREDIBLE INSECT AWARDS

ALTHOUGH ALL INSECTS ARE INCREDIBLE IN THEIR OWN WAY, SOME

truly shine. Take some species of fireflies, for example. These flying insects actually make their own light! They do this by mixing oxygen with other substances in a special organ in their abdomen, which then glows. The ability of an animal to create its own light is called bioluminescence. Prepare to be wowed by these other stars of the insect world.

On long summer days, you'll hear them long before you see them: *Tsh-ee-EE-e-ou*. It's the sound of a male cicada trying to attract a female with his song. He makes the sound by rapidly moving drumlike membranes called tymbals in his abdomen. The sound is then amplified, or made louder, by air sacs in his body. The cicadas' song can reach 100 decibels, about as loud as a lawn mower, and can be heard from a quarter mile (400 m) away.



The Actaeon beetle is the world's heaviest insect. In its larval (pre-adult) stage, it gorges on dead wood in the Amazon rain forest of South America. At seven ounces (200 g), the heavyweight larva tips the scales at about the same as an adult. That's two ounces (57 g) heavier than a baseball!



The deadliest insects in the world are several species of the *Anopheles* mosquito. While the mosquito bites alone are harmless, bites from females carrying a malaria-causing parasite can be deadly. Hundreds of thousands of people die each year from malaria.



Watch out! The trap jaw ant can strike faster with its jaws than any other animal. This South and Central American insect can snap up prey by closing its lower jaws, called mandibles, at an amazing 140 miles per hour (225 kph)—that's much faster than the blink of an eye.



The female giant water bug lays her eggs on the shell of the male bug. The male carries the eggs on his back, bringing them to the surface every once in a while for air. During that time, the weight of the eggs makes it difficult for the male to swim and to escape predators. But he struggles on, and after one to three weeks, the eggs hatch.



Male dung beetles are the strongmen of the insect world. They can carry a load 1,141 times their own body weight. They use this strength to carry dung, but also to fight off other males. In comparison, an African elephant can carry only one-quarter of its own weight.

BUG BITE SCIENTISTS ESTIMATE THERE MAY BE AS MANY AS 30 MILLION SPECIES OF INSECTS STILL TO BE DISCOVERED.

LADIES AND GENTLEMEN: THE BEETLES!

BEETLES ARE THE ROCK STARS OF THE INSECT WORLD. THEY ARE POPULAR AS

pets in some countries, jewelry in others, and even represented a god in ancient Egypt! Scientists estimate that beetles account for about one-quarter of all known animal species, and that many more species are still waiting to be discovered.

WHERE DO BEETLES LIVE?

Beetles make their homes pretty much everywhere on Earth except Antarctica. They live on the ground in damp habitats, deserts, or rocky areas, where they eat worms, snails, and other small insects. Others are leaf beetles that eat plants. Leaf beetles are usually smaller than ground beetles, and are more brightly colored. There are even aquatic beetles that live in fresh water and swim using their strong hind legs.

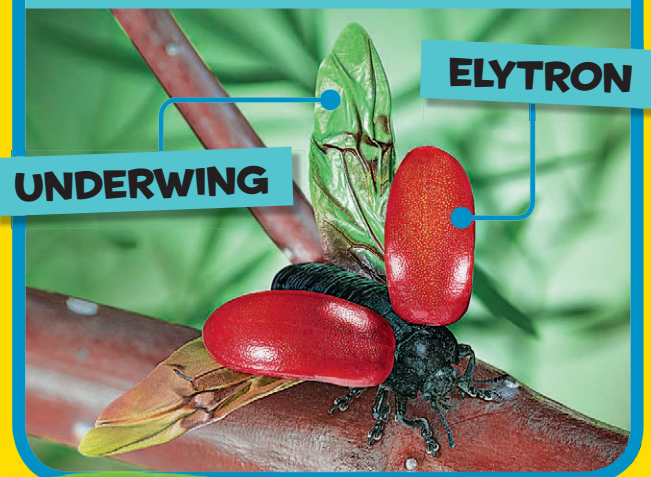
GREAT DIVING BEETLE



BUG BITE SCIENTISTS WHO STUDY BEETLES ARE CALLED COLEOPTERISTS.

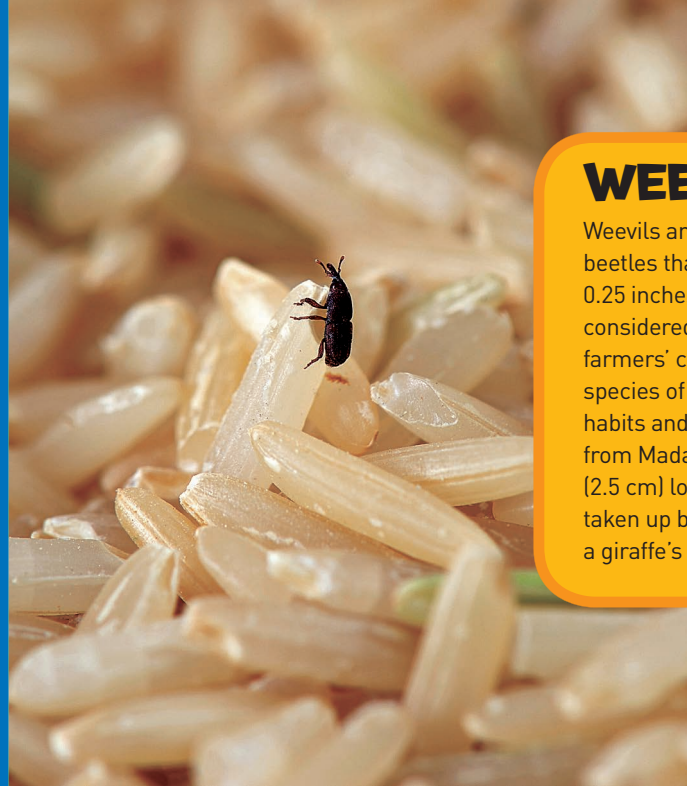
IS THAT A BEETLE?

How will you identify a beetle when you see it? In addition to having the three insect body parts, adult beetles also have two sets of wings—light underwings used for flying, and hard wing covers called elytra. Look for the straight line down the middle of a beetle's back where the elytra wings meet.



LADYBUGS

Also called ladybird beetles, these yellow, pink, red, or orange insects with black spots are found all over the world. Farmers and gardeners often like ladybugs because most species are “helper insects” that eat other, crop-destroying insects.



Appetite alert! Weevils are sometimes found in breakfast cereals and flour. Grain or wheat weevils love to eat wheat products but cause no harm to humans if they are accidentally eaten.

WEEVILS

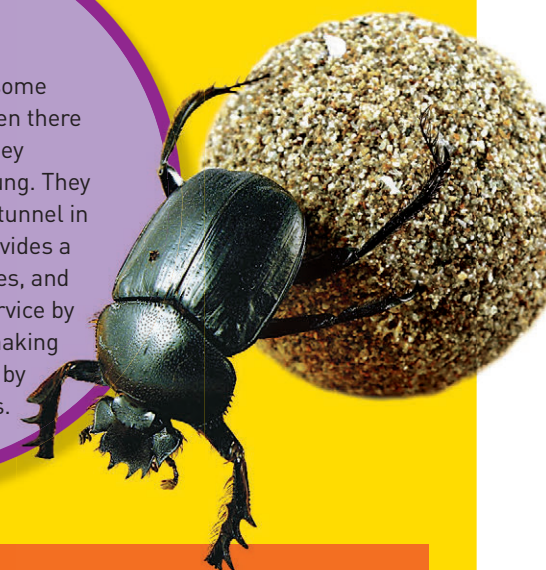
Weevils are diverse and fascinating tiny beetles that are usually no more than 0.25 inches (6 mm) long. Most are considered pests because they eat farmers' crops. There are over 60,000 species of weevil and each has different habits and habitats. The giraffe weevil, from Madagascar, grows to be 1 inch (2.5 cm) long, and most of its size is taken up by a long neck that looks like a giraffe's neck.



GIRAFFE WEEVIL

DUNG BEETLES

Some beetles eat leaves, some eat crops or other insects. Then there are the dung beetles. They eat animal feces, or poop or dung. They also lay their eggs in it, roll it, tunnel in it, and live in it. The dung provides a nutritious meal for the beetles, and the insects do the world a service by cleaning up the dung and making the soil fertile for plants by redistributing nutrients.



HERCULES BEETLES

Hercules beetles get their name from their size and strength. These beetles can carry up to 850 times their own weight (a human can support only 17 times his or her own body weight). They are usually found on the ground in tropical rain forests of Central and South America, and some Caribbean islands. Male Hercules beetles can be up to 7.5 inches (19 cm) long—about the length of a new pencil. About half its length is taken up by long, hornlike pincers.



EXPLORER'S CORNER

Mostly when we think of pollinators, we think of bees and butterflies. But beetles pitch in too! Beetles have been around for a very long time and they have developed special relationships with certain plants, which may have bigger flowers and stronger scents to attract these insects. In places of the world where bees are scarce, such as dry or arid regions, beetles do the work normally done by bees.

INSECTS ON THE MOVE

INSECTS LIVE IN A VARIETY OF HABITATS—FROM

scorching hot deserts to freezing cold tundra, deep underground or in the highest mountains, and everywhere in between. Many insects spend their lives in one place. But some prefer travel. Check out these remarkable tales of insects on the move.

BEE-WARE

Sometimes humans are responsible for insects being moved to somewhere new. Honeybees, for example, were brought to North America by settlers in the 1600s to produce honey. But there can be a downside to bringing foreign insects to a new home. In 1957, African honeybees were being studied at a research station in Brazil when they escaped and mated with European honeybees. Their offspring created a new species of bee called Africanized bees, or “killer bees.” These bees then spread by about 250 miles (400 km) per year until the species reached the southern United States. They are considered a problem in many states because they are more aggressive than other bees.

FLIGHT OF THE BUTTERFLIES

Every spring, massive colonies of monarch butterflies fly as many as 3,000 miles (4,800 km) from Mexico to Canada to lay their eggs on milkweed plants, which is the only food source for the monarch caterpillars. When the cold weather arrives, the butterflies fly south again. Two or three generations of butterflies may live and die over each summer. When the cold weather arrives, the last generation flies south again to their warm winter home.

MONARCH BUTTERFLY

ARMY ANT

THE ANTS GO MARCHING

Ants can be found almost everywhere on Earth. But the largest colonies of ants are the army ants of Central and South America and the driver ants of Africa. The Central and South American army ant, or *eciton Burchellii* species (shown on map), is the most studied army ant in the world. Given its raiding behavior, it was the first to be described by the term army ant. When a colony is on the move, it is called a column. In Africa, driver ant columns can be up to 300 feet (100 m) long and made up of about 20 million marching ants! Although the columns move at about a rate of only 46 feet (14 m) an hour, they will devour anything in their path, including venomous snakes and small mammals.

EQUATOR

NORTH AMERICA

MONARCH BUTTERFLIES

ARMY ANTS

SOUTH AMERICA



LOCUST

LOCUST SWARMS

When groups of locusts join together they become a swarm. Desert locusts in northern Africa, the Middle East, India, and Asia can form swarms that cover several hundred square miles, and contain billions of insects eating their body weight in food each day. Once the locusts have eaten all the vegetation, the swarm moves on. The swarm can travel anywhere from 3 to 80 miles (5 to 130 km) per day and devastate an area of plant life.

LOCUSTS

DRAGONFLIES

LOCUST MIGRATION

When searching for new food sources, adult Australian plague locusts take advantage of warm but strong storm winds. They ride the winds to migrate from one area to another, taking off at dusk and flying up to ten hours and several hundred miles at a time. This long-distance migration allows Australian plague locusts to survive in harsh environments. When many swarms group together, they are considered a plague because they can eat up to 2,204 pounds (1,000 kg) of vegetation and food crops per day.

DRAGONFLY DIRECT

Globe skimmers hold the record for the longest migration of any insect. Carried by strong winds, these dragonflies travel from India to East and southern Africa and back again, a journey of about 8,700 to 11,000 miles (14,000 to 18,000 km), much of it over the Indian Ocean.

DRAGONFLY

AUSTRALIA LOCUSTS

0 2,000 miles
0 2,000 kilometers

BUG BITE

THE ONLY INSECT THAT LIVES IN ANTARCTICA IS A WINGLESS MIDGE (A TYPE OF TINY FLY) NAMED *BELGICA ANTARCTICA*.

A PHOTOGRAPHIC DIAGRAM

BODY PARTS

INSECTS—*BUG-LY* OR *BEE-UTIFUL*? BEAUTY IS IN THE EYE OF THE BEE-HOLDER, BUT IT CAN BE DIFFICULT TO BEHOLD

when your subject flits, fidgets, and quickly scatters. Insects always seem to be flying, moving, or hiding. Luckily, these close-up photographs give us a good look at insect bodies. But you can also take out a magnifying glass and try to get a good look at live insects up close and in person.

WINGS

Some insects have four wings, others have two or none at all. Insects are champion fliers—they can move forward, backward, sideways, and some can even hover in place. Research shows bees flap their wings an amazing 230 times a second.

EXOSKELETON

Insects have a hard outer covering called an exoskeleton that protects their internal organs and supports their muscles. Exoskeletons are made up of separate plates with a soft material in between that allows the insect to move its legs.

OVIPOSITOR

Some female insects have an ovipositor on their abdomen. This organ is used for laying eggs. It can also be used for stinging, in the case of bees and wasps.

ABDOMEN

The rear body part of an insect is called the abdomen.

LEGS

Insects have six legs—three on either side of the body. Claws on the ends of the legs are used for gripping when climbing or walking. Between the claws are sticky sacs that help insects cross smooth surfaces. Monarch butterflies taste with the tips of some of their legs. Dung beetles use their front legs like shovels. Some insects, such as grasshoppers, have powerful back legs for jumping.

ANTENNAE

Almost all insects have two antennae. Their length and shape depend on their use, which could be to break up prey, detect odors, or find food. Male mosquitoes have feathery antennae to detect the humming wings of females. Cockroaches have long antennae used to feel things around them.

HEAD

The head is the first of an insect's three main body sections. It's here that an insect's eyes, mouthparts, and antennae (for those insects that have them) are located.

EYES

Many insects have large compound eyes that detect motion. Compound eyes are made up of up to 30,000 specialized lenses called ommatidia.

THORAX

The thorax is the middle section of an insect, after the head. The legs and wings are usually found here.

MOUTHPARTS

Mouthparts are specialized, depending on the food an insect eats. Many chewing insects have mouthparts that are made up of a pair of jaws, called mandibles, with teeth. Some also have lips and palps that taste food on either side of their jaws. Many butterflies and moths have long, tube-like mouthparts called a proboscis, used to suck up liquid.

BUTTERFLY


HAIR

Hair on some insect bodies acts as motion detectors so insects can sense what's around them. Some caterpillars have poison-filled hairs that protect them from predators.

2

AN INSECT'S LIFE





This time-lapsed, composite image shows a viceroy butterfly emerging from its chrysalis. Viceroys are a North American butterfly that look similar to monarch butterflies.

EGGS TO ADULTS

WHETHER AN INSECT LIVES FOR JUST ONE DAY (THE LIFE SPAN OF A MAYFLY) OR FOR 50 YEARS (THE LIFE SPAN OF

an African termite queen), its body undergoes a remarkable transformation from birth to adult. This change is called metamorphosis. There are two different kinds of metamorphosis: complete and incomplete.

COMPLETE METAMORPHOSIS

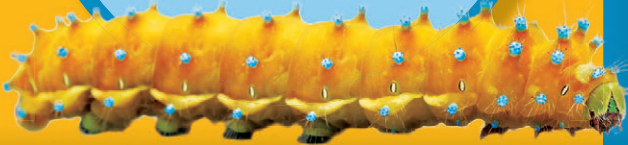
1. EGG

Most insects begin life as an egg. Eggs are laid singularly or in clusters of hundreds. Female insects lay eggs in areas where there is food for the larvae when they hatch. Some insect larvae have a specialized organ on their heads called an egg buster. They use the egg buster to crack open their shell.



2. LARVA

Larvae often look like worms. They can be called caterpillars (butterflies and moths), maggots (flies), or grubs (beetles). Larvae usually eat different food than the adult. Their main purpose is to eat and store energy for the next stage. During that time, they may molt, or shed their skin, several times.



3. PUPA

In the pupal stage, the insect's body breaks down and reforms into its adult shape. During this period it does not eat, and it is usually found wrapped in a protective case, or cocoon, in a safe hiding place.



4. ADULT

When an insect emerges from the cocoon, it is an adult. Adults live from just a few days in some species to many years in others.

The giant peacock moth is the largest moth or butterfly in Europe. It has a wingspan of four to eight inches (10 to 20 cm).

BUG BITE MALE GRASSHOPPERS USE AN ORGAN AT THE BASE OF THEIR WINGS TO "CHIRP" TO ATTRACT A MATE.

INCOMPLETE METAMORPHOSIS

1. EGG

Eggs are laid singularly or in clusters near a food source or in an environment, such as on a plant near water, that is suitable for the longer nymph stage of life. In some insects that undergo incomplete metamorphosis, the eggs mature inside the female's body. They are then carried around in a capsule on the female's body and are born from the capsule.

2. NYMPH

Nymphs are young insects. Their exoskeletons don't grow as the insect does, so when the insect gets too big for its skin, it molts, or sheds—from 4 to 20 times.

3. ADULT

In most insects that undergo incomplete metamorphosis, nymphs look much like the adults, except the adults are larger and have fully formed wings.

DRAGONFLY

MATING

Most insects mate to produce offspring. They use many tricks and techniques to attract a mate, from "singing," to fighting or flashing brightly colored wings. Usually a female and a male are needed to reproduce, but there are some exceptions. For example, cabbage aphids and some stick insects can reproduce on their own in a process called parthenogenesis.

Fireflies find mates by lighting up a special organ in their abdomens.

By the Numbers

4,000,000

eggs are laid by an African driver ant queen every 25 days.

600,000

eggs can be laid by a queen bee in her lifetime.

30,000

eggs are laid by a termite per day.

9,000

eggs are laid by a housefly in her lifetime.

30

eggs are laid by a stag beetle in her lifetime.

PARDON MY PUPAE



IF INSECTS MATURED LIKE HUMANS, THE PUPAL STAGE

would be like the teen years—an intense period with wild growth spurts, time spent alone, and miraculous transformations. And just like it is in moody teenagers, this stage is ruled by hormones, or chemicals produced by glands in the body that affect behavior and changes in the body.

HOME SWEET COCOON

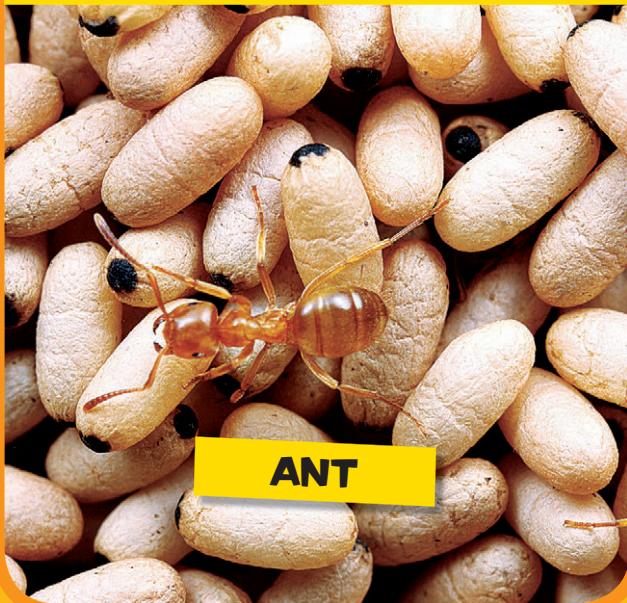
Have you ever built yourself a protective hideout with blankets and pillows? You might have called it your “cocoon.” Some insects make cocoons to protect themselves while their bodies are forming into adults. Butterflies and moths make cocoons, as do beetles, flies, bees, and wasps. Insect larvae make cocoons using a silklike thread produced from glands on their bodies. Some spin the silk in a figure-eight pattern and encase themselves. When the silk comes into contact with the air, it begins to harden.

THE PUPAE OF SOCIAL INSECTS, SUCH AS MANY BEE SPECIES, ARE PROTECTED BY THE ADULTS OF THE HIVE.

BUG BITE ANT PUPAE CAN PRODUCE SOUND TO COMMUNICATE WITH THE OTHER ANTS IN THE COLONY.

PUPAE PROTECTION

A cocoon is like a tent—it may keep the rain and wind out, but it might not prevent a hungry predator from getting inside. Some insect species have developed clever pupae protection strategies. Blue butterflies trick ants into looking after them during the pupal stage. The butterfly larva releases chemicals called pheromones that make the ants believe it is one of their larvae. The ants take the cocoon back to their underground nest and care for it until the butterfly is ready to emerge.



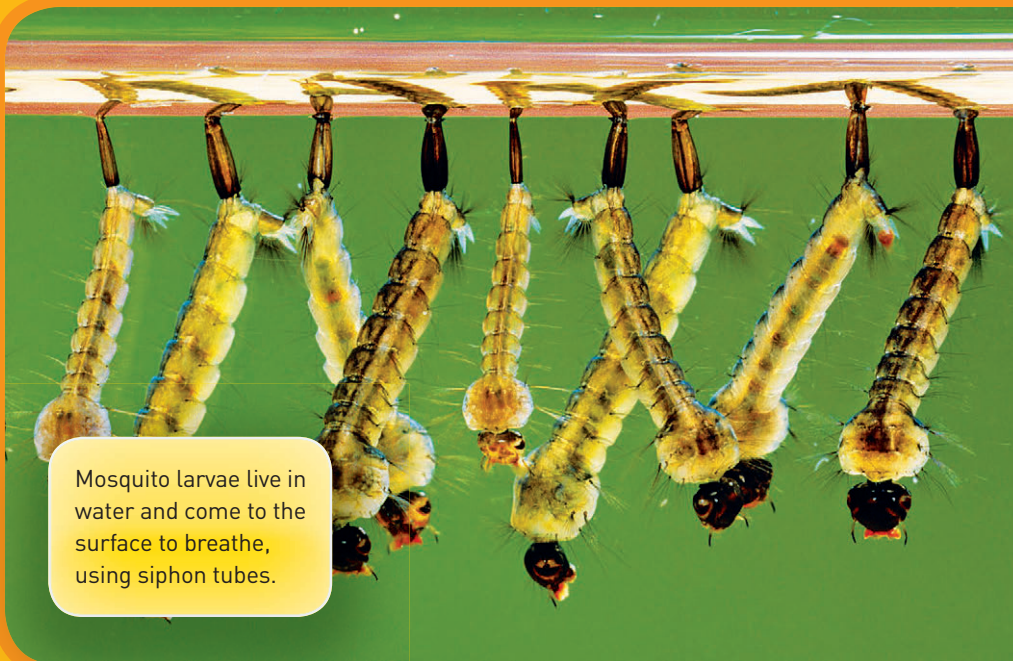
ANT

CATERPILLAR TO BUTTERFLY

One day you're a wormlike caterpillar and the next (well actually, weeks, months, or sometimes years later) you're a beautiful, winged butterfly or moth. This complete overhaul from pupa to adult involves time spent in a cocoon, or chrysalis. The word "chrysalis" comes from the Greek word for "gold"—since many butterfly pupae have a gold tint.



A moth emerges from its chrysalis.



Mosquito larvae live in water and come to the surface to breathe, using siphon tubes.

UNDERGROUND, UNDERWATER, UNDER WHERE?

Many butterfly and moth cocoons hang from the undersides of branches by a hook in the pupa's body called a cremaster. Other moths, such as the hummingbird moth, have larvae that dig underground to build their cocoons. Stag beetles also have underground cocoons, and bark beetles build their cocoons under tree bark. Caddisflies (or sedges), mosquitoes, and blackflies build their cocoons underwater.

FEASTING AND FORAGING

THEY CHOMP, THEY SUCK, THEY SWALLOW THINGS WHOLE. INSECTS WOULD MAKE AMAZING

dinner guests because they almost never turn down a meal. They also eat a variety of foods from poop to plants to each other.

JAW-DROPPING APPETITE

Some insects are known for their ability to eat a lot of food. Locusts can eat their own weight in plants every day. This makes a swarm, or plague, of locusts dangerous for farmers. They can tear through a field in no time—leaving just stalks behind. Silkworms, the caterpillar of the *Bombyx mori* moth, also have healthy appetites. They can eat their weight in mulberry tree leaves in a day. Insects that eat plants and other insects have mouthparts called mandibles. These are strong jaws used for tearing and grinding food.

A plague of locusts lands on a farmer's field, ready to eat through the crop.

BUG BITE THERE ARE ABOUT TEN SPECIES OF MOTHS THAT DRINK THE TEARS OF ANIMALS FOR NUTRIENTS.



SPONGERS

Some species of houseflies use mouthparts called a labium to absorb food much like a sponge does. Pads on the bottom of the housefly's tongue, called labella, secrete saliva, which breaks down food so that the fly can absorb it.

I WANT TO SUCK YOUR BLOOD

Fleas, lice, bedbugs, some flies, and female mosquitoes are famous bloodsuckers. They feed on human and other animal blood. Some insects need the blood to produce eggs. Bloodsuckers are annoying and some, including certain species of mosquitoes, can also transmit diseases such as malaria, yellow fever, and West Nile virus.



NECTAR LOVERS

One thing nectar and blood-sucking insects have in common is the ability to pierce the skin of a plant or animal, then use sucking tubes to get the liquid out. They do this using a long tube called a proboscis. Many butterflies and moths have a long proboscis that rolls up under the insect's head and unrolls when needed. It allows the insect to get at hard-to-reach fluid, such as nectar buried deep inside a plant.

HUNGRY ANYONE?

Insects as a whole will eat virtually anything, but some types are specialists. Flies and dung beetles are particularly partial to poop, or the half-digested food in bird or other animal poop. Honey pot ant colonies have specialized worker ants in the colony whose job it is to gorge on food until their abdomens swell with a honeylike substance. They then hang from the ceiling of the nest. When food is scarce, the other ants will eat from this store. And of course, some insects eat other insects. Mantises like to ambush their prey, usually eating the head first before moving on to the rest of the body.

**SOME
ADULT INSECTS
DO NOT HAVE
MOUTHPARTS AND
EAT NOTHING AT ALL.**



INSECT HOMES

INSECTS ARE NOT HARD TO FIND. IF YOU LOOK, YOU WILL SEE THEM CRAWLING ON THE GROUND, RESTING ON PLANTS, OR

flying through the air. Some flying insects, such as dragonflies, butterflies, and moths, have no permanent home, choosing instead to flit from place to place. But others build impressive structures as nests, or make their homes on other animals.



LIVING AND WORKING TOGETHER

While most insects prefer to be on their own, others live together in colonies or nests. These insects are called social insects. Wasps, bees, ants, and termites are examples of social insects that work together to build nests. Paper wasps collect wood and plant fibers, and mix them with saliva to create paperlike nests that hang from tree branches. Bees create nests using a wax that they secrete, usually high up in cavities in trees. Ants build underground nests with several different chambers, or rooms. Some ants even create living nests out of their own bodies. These nests are called bivouacs. Termites create giant mounds made of dirt, wood, mud, and poop. The shape of these structures allows for air flow that regulates the temperature within.

OUR HOME IS THEIR HOME

We don't usually invite insects into our homes, but they come in anyway. Many are considered household pests. The most unwanted insect guests are cockroaches. They make their homes in cracks in walls or under sinks and furniture. Cockroaches become a problem for homeowners because they multiply quickly, require little food to survive, and are expert hidiers. Another insect that occasionally shares our homes are bedbugs that live in our beds and come out to feed on our blood at night. There's even a type of beetle that lives in carpets.



BUG BITE WEAVER ANTS BUILD NESTS BY GLUING LEAVES TOGETHER USING SILK MADE BY THEIR LARVAE.



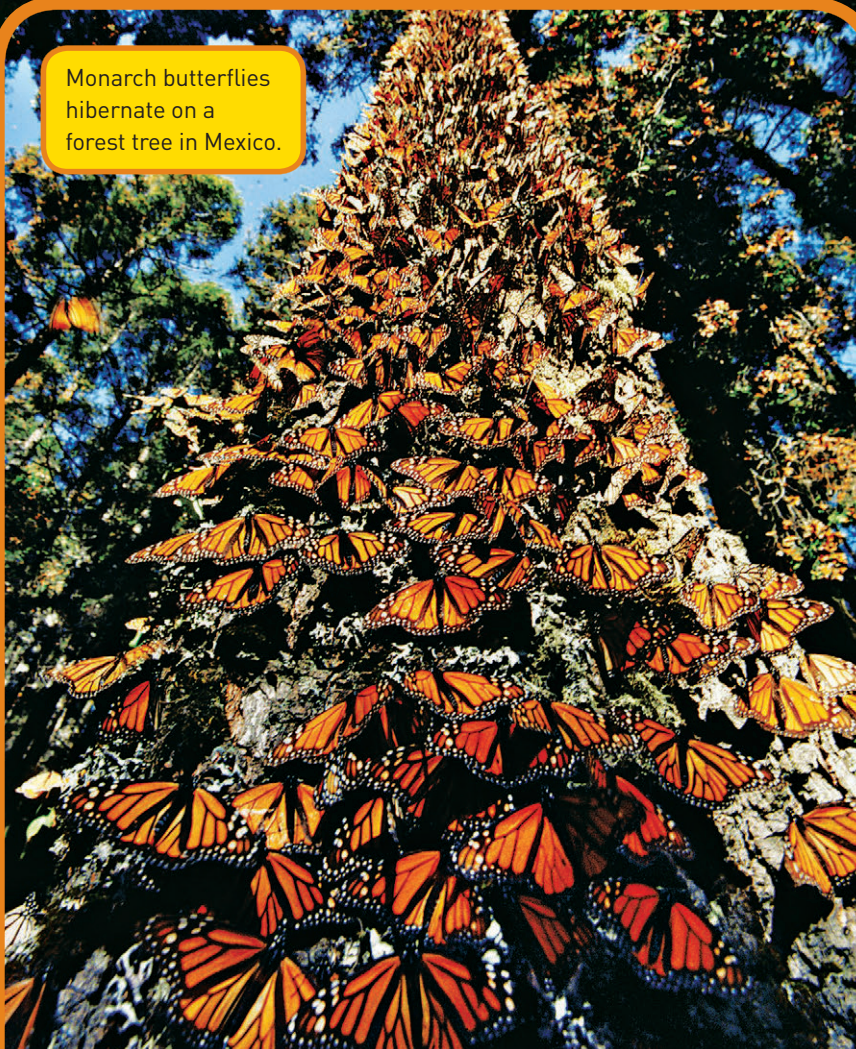
DIVING BEETLE

LIVING IN WATER

Some insects make their homes in water. But all insects need to breathe air to survive, so they have adapted some pretty cool ways of living in their watery habitats. Mosquito larvae float just under the water's surface and stick up little tubes to breathe. Other insects have gills, or organs that allow them to filter oxygen from the water into their bodies. Diving beetles carry air from the surface in sacs or bubbles so they can breathe underwater.

The family that dives together thrives together. This diving beetle is carrying its eggs on its back.

Monarch butterflies hibernate on a forest tree in Mexico.



WINTER HOMES

Insects are only as warm as their surroundings. To survive the cold winter or a dry season, some insects migrate to other climates. Others burrow underground. Some hibernate during the winter by finding a sheltered place and clustering together.

**FLEAS
MAKE THEIR HOME ON
A HOST, SUCH AS A
DOG, AND THEIR
SURROUNDINGS—including
YOUR RUGS!**

EXPLORER'S CORNER



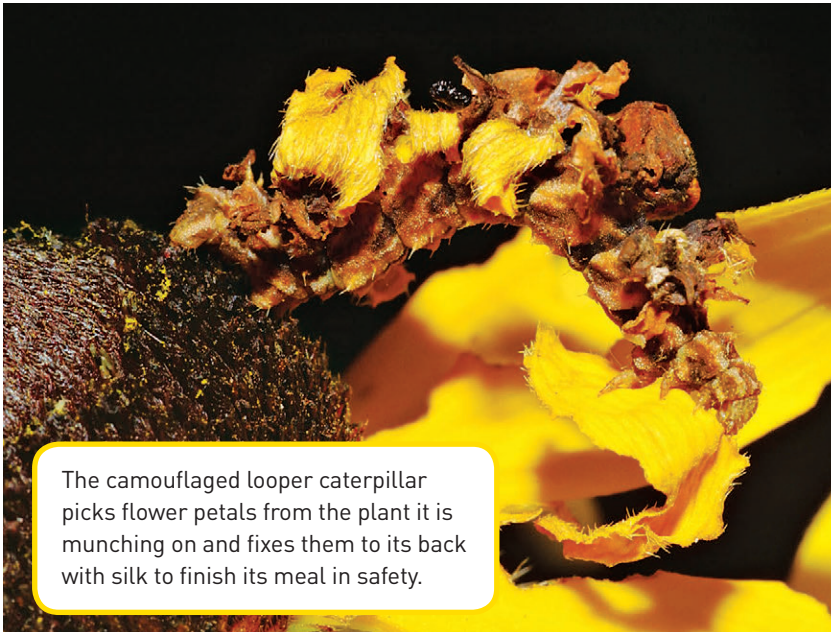
Insects need safe homes too! Protecting and providing places for bees to nest is one of the best ways of making sure that they can visit flowers and pollinate crops. Most solitary bees nest in holes in dry wood or the ground.

A PHOTO GALLERY

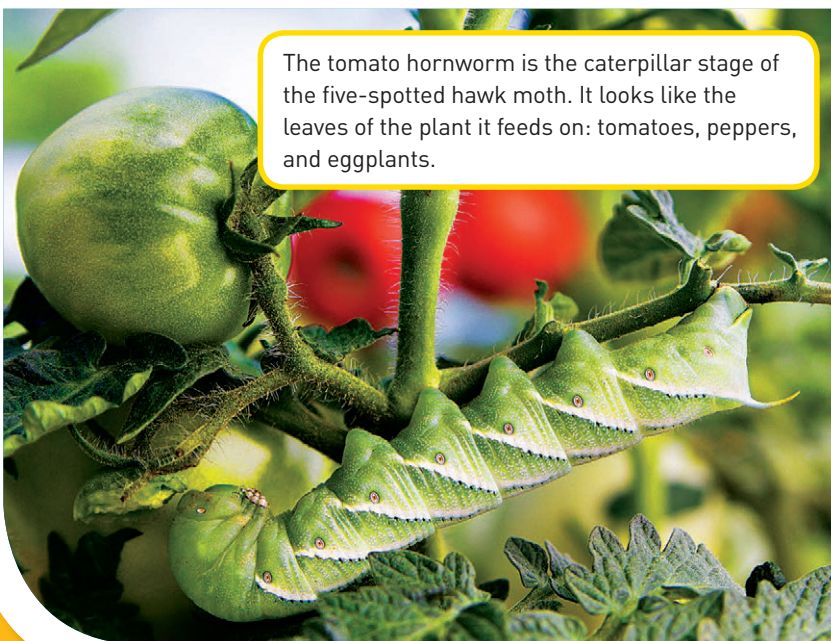
SPOT THE INSECT

HUNDREDS, IF NOT THOUSANDS, OF

insects are hanging out in your backyard or local park right now. You can't see them all because they are small, and some have natural camouflage that allows them to blend into their surroundings. Can you find the insects in these photos?



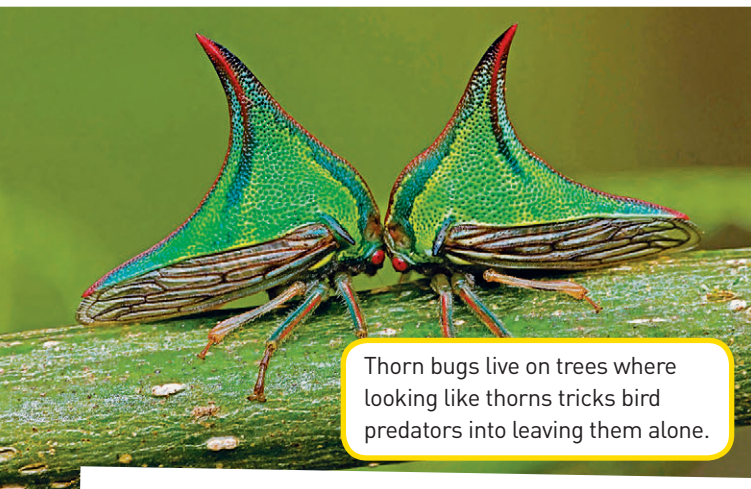
The camouflaged looper caterpillar picks flower petals from the plant it is munching on and fixes them to its back with silk to finish its meal in safety.



The tomato hornworm is the caterpillar stage of the five-spotted hawk moth. It looks like the leaves of the plant it feeds on: tomatoes, peppers, and eggplants.



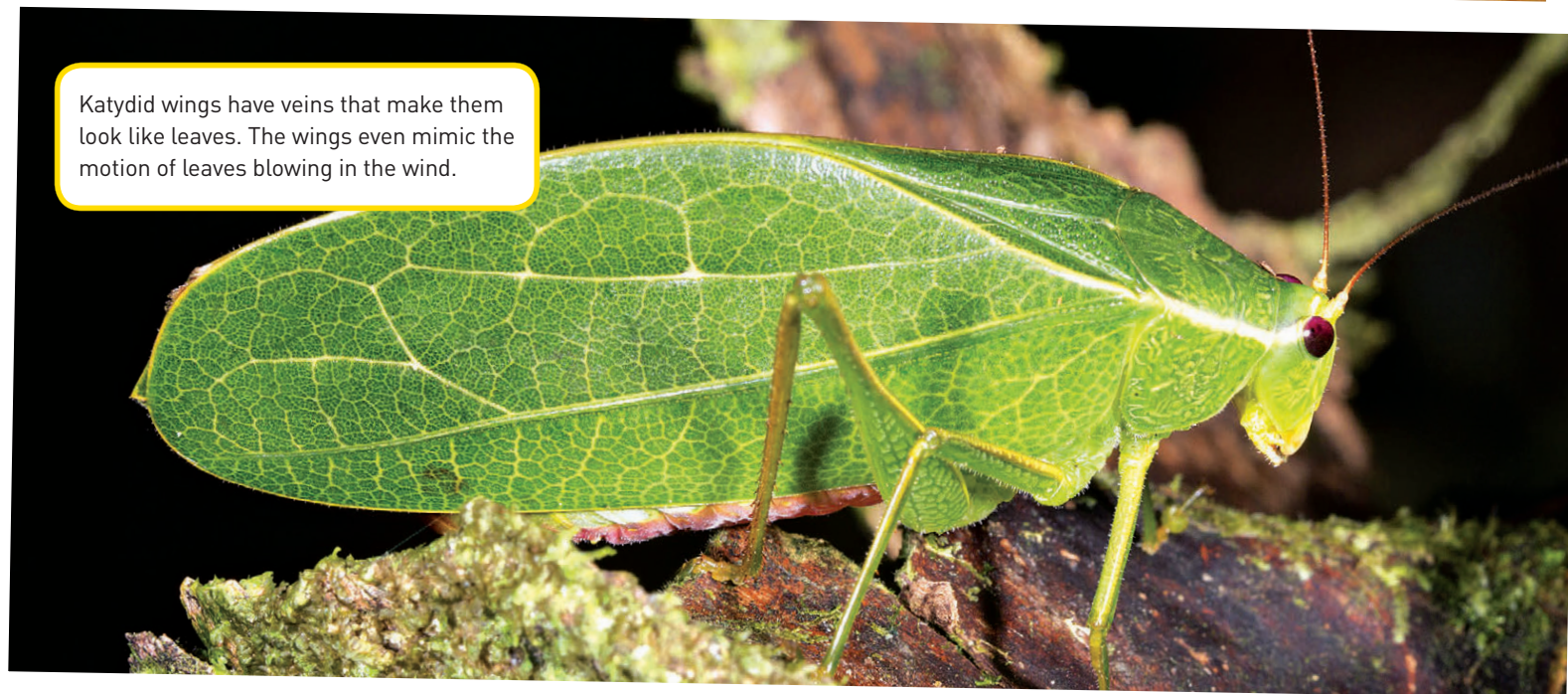
The orchid mantis is a perfect mimic for an orchid flower. Its legs look like petals.



Thorn bugs live on trees where looking like thorns tricks bird predators into leaving them alone.



The leaf litter mantis looks like a dead leaf, allowing it to blend into the forest floor.



Katydid wings have veins that make them look like leaves. The wings even mimic the motion of leaves blowing in the wind.



These spiny bugs are mimics. They look like the flowers they feed on.

**WHAT'S THAT
PEEKING OVER A LEAF? OR
CREEPING UNDER A LOG?
IT'S TIME TO SHED
SOME LIGHT ON
EVERYTHING INSECTS.**



AHHH! INSECTS! Cockroaches, ants, dragonflies, and beetles. Wings, pincers, mandibles, and antennae. Whether insects fill you with dread or wide-eyed wonder, there's no denying that these bitty critters are some of the most fascinating and diverse creatures on Earth. Ready to skitter into the incredible world of creepy-crawlies? It's time to learn everything about **INSECTS**.

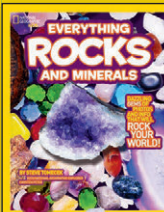
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