



# The New York Times

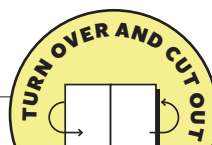
For Kids

EDITORS' NOTE: THIS SECTION SHOULD NOT BE READ BY GROWN-UPS

**BUZZ!**  
**WHINE! CHIRP! HUM!**  
 INSECTS ARE IN TROUBLE.

MEET THE NEW LITTLE MERMAID, PAGE 9 • HOW TO STEAL A BASE LIKE THE PROS, PAGE 13 • WILL KIDS GET KICKED OFF SOCIAL MEDIA? PAGE 3 • DRIVERS, START YOUR GO-KARTS! PAGE 13 • ASTRONAUTS GET A NEW MOON SUIT, PAGE 4





BY KATE GOLEMBIEWSKI

# THEY'RE CREEPY. THEY'RE CRAWLY. AND WE CAN'T LIVE WITHOUT THEM

ILLUSTRATIONS BY  
TIM McDONAGH

YOU DON'T NEED A NET TO COLLECT SOME OF THE COOLEST, CRAZIEST BUGS AROUND.  
(BUT A PAIR OF SCISSORS MIGHT HELP.)

CUT HERE

SPECIMEN NO. 1

**BUMBLEBEE**  
*In Demand and in Danger*

SPECIMEN NO. 2

**BLUE MUD WASP**  
*Spider Stalker*

SPECIMEN NO. 3

**FIREFLY**  
*Bright Bug*

SPECIMEN NO. 4

**KARNER BLUE BUTTERFLY**  
*Pretty Picky Eater*

SPECIMEN NO. 5

**FRUIT FLY**  
*Lab Assistant*

SPECIMEN NO. 6

**IRONCLAD BEETLE**  
*Indestructible Insect*

SPECIMEN NO. 7

**BOTTLE FLY**  
*Gnarly Nibbler*

SPECIMEN NO. 8

**APHID**  
*Littlest Livestock*

SPECIMEN NO. 9

**LEAFCUTTER ANT**  
*Tiny Farmer*

SPECIMEN NO. 10

**FLESH-EATING BEETLE**  
*The Undertaker*

SPECIMEN NO. 11

**GRASSHOPPER**  
*Acrobatic Snack*

SPECIMEN NO. 12

**DUNG BEETLE**  
*Poop Patrol*

SPECIMEN NO. 13

**CHOCOLATE MIDGE**  
*Candy Maker*

SPECIMEN NO. 14

**WALKING LEAF**  
*Master of Camouflage*

SPECIMEN NO. 15

**COCKROACH**  
*Cleanup Crew*

SPECIMEN NO. 16

**BOMBARDIER BEETLE**  
*Most Explosive Personality*

SPECIMEN NO. 17

**TERMITE**  
*Wood Destroyer*

SPECIMEN NO. 18

**GIANT SILK MOTH**  
*Dreamy Weaver*

SPECIMEN NO. 19

**YELLOW GARDEN SPIDER**  
*Pest Control*

SPECIMEN NO. 20

**DRAGONFLY**  
*Eyes in the Skies*

SPECIMEN NO. 21

**STINK BUG**  
*Worst-Smelling*

SPECIMEN NO. 22

**ORCHID MANTIS**  
*Dressed to Kill*

SPECIMEN NO. 23

**WATER STRIDER**  
*Unsinkable Stalker*

SPECIMEN NO. 24

**WAXWORM**  
*Nature's Recycler*

SPECIMEN NO. 25

**GIANT WATER BUG**  
*Underwater Assassin*

SPECIMEN NO. 26

**CADDISFLY**  
*Most Bling*

SPECIMEN NO. 27

**MOSQUITO**  
*Bloodsucker*

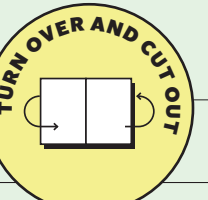
SPECIMEN NO. 28

**LADYBUG**  
*Farmers' Friend*

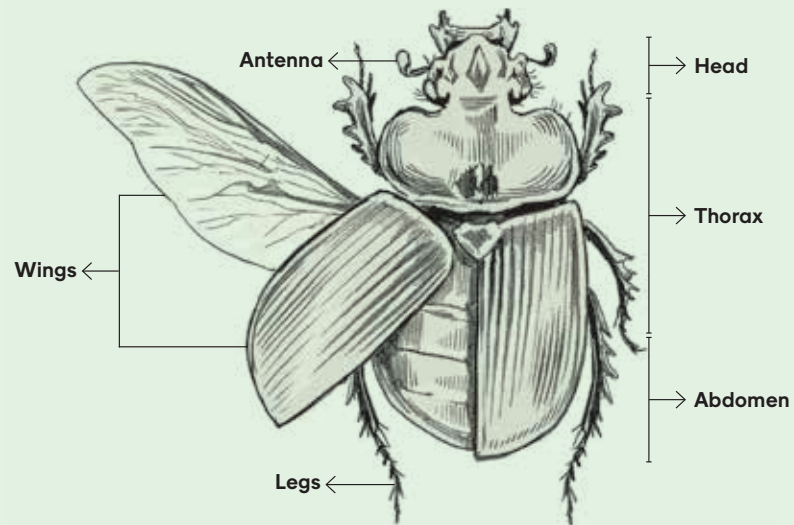
CUT HERE



# Science



## ANATOMY OF AN INSECT



**S**pring has sprung, and summer isn't far away. That means it's time for baseball, barbecues, bike-riding and...bugs! There are thousands of different types of insects all around, flitting from flower to flower, tunneling through the ground, maybe buzzing in your ear. In fact, there are about a billion times more insects on Earth than humans.

Here's the thing: There should be even more. Insect populations around the world are dropping because of climate change, habitat destruction, pesticides and other threats. Some scientists are calling it "the insect apocalypse."

A world without insects is not a world you want to live in. Actually, it might not even be a world you *could* live in, because insects are so important to life on Earth. These tiny creatures play a huge role in keeping the planet free of gross dead stuff, helping create the food we eat and being the food for other animals. Their amazing adaptations even inspire inventors and help doctors care for patients.

If you think about it, insects are basically superheroes. But they don't get a lot of respect. These collector's cards are our way of saying, "Hey, bugs, we're your biggest fans!" Cut them out to learn about some of the most important, most incredible, most bizarre bugs doing lots of dirty work (sometimes really dirty work) behind the scenes. Based on their jobs in nature, we put them into five categories:

**POLLINATORS** help flowers multiply, and fruits and nuts grow.

**PREDATORS** keep populations of other creatures in control.

**DECOMPOSERS** eat dead things and waste, returning nutrients to the soil.

**HUMAN HELPERS** make life better for people.

**ROLE MODELS** inspire and amaze with their unique abilities.

Grab scissors to start your own bug collection now — no wriggling required!

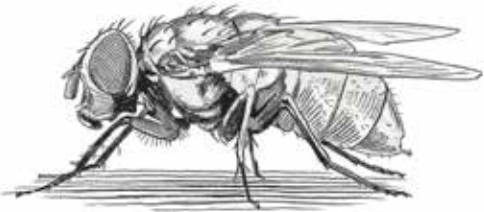
BY KATE GOLEMBIEWSKI · ILLUSTRATIONS BY JOE MCKENDRY

## GLOSSARY

- ARTHROPOD**  
An animal without a backbone that has jointed limbs, a tough exoskeleton and a segmented body. Insects, arachnids and crustaceans (like crabs and shrimp) are all arthropods.
- INSECT**  
A six-legged arthropod with compound eyes, a three-part body (head, thorax, abdomen) and a pair of antennae.
- BUG**  
Lots of people use "bug" as a catchall word for any small creepy-crawly critter. But technically, a bug is a specific kind of insect. They belong to a group of insects called Hemiptera and have specialized mouthparts for sucking juices out of plants (or other insects).
- LARVA**  
A baby insect. Larvae hatch out of eggs, eating and growing until they transform into adults. Caterpillars and maggots are examples of larvae.
- ARACHNID**  
An (almost always) eight-legged arthropod, with a body divided into two main sections and specialized mouthparts to help it grab food. It doesn't have wings or antennae. Examples include spiders, ticks and scorpions.

### BOTTLE FLY

*Gnarly Nibbler*

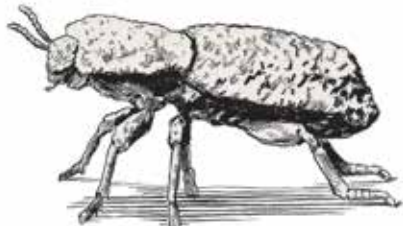


**CATEGORIES:** Decomposer, Human Helper  
**ABOUT THE SIZE OF:** A black bean

These insects often lay their eggs in decaying flesh so that the larvae (babies) are surrounded by a nutritious, if nasty, meal. As disgusting as that sounds, this icky diet can be lifesaving for people with terrible wounds. The larvae, called maggots, eat dead meat, so doctors and nurses put them on wounds that won't heal to eat away the damaged tissue, leaving just healthy flesh behind.

### IRONCLAD BEETLE

*Indestructible Insect*

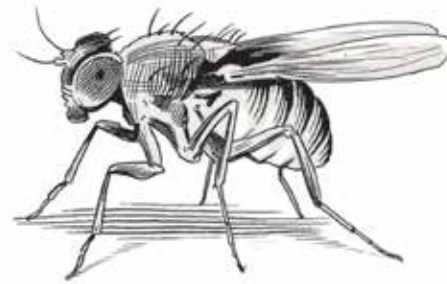


**CATEGORIES:** Decomposer, Role Model  
**ABOUT THE SIZE OF:** An almond

Ironclad beetles are some of the toughest bugs on Earth — they can even survive being run over by a car. The key to their sturdiness is in the hard coverings on their backs, which are held together with microscopic interlocking pieces like a jigsaw puzzle. Scientists are studying them to learn how to make stronger and safer aircraft.

### FRUIT FLY

*Lab Assistant*



**CATEGORIES:** Human Helper, Decomposer  
**ABOUT THE SIZE OF:** The head of a matchstick

These are the tiny flies you see around an overripe bunch of bananas. They're not found just in kitchens, though — fruit flies (*Drosophila melanogaster*) are important for many laboratory experiments. They reproduce really quickly, and scientists know a lot about breeding and raising them, so they're useful for studying DNA and how characteristics are passed down from one generation to another.

### KARNER BLUE BUTTERFLY

*Pretty Picky Eater*



**CATEGORY:** Pollinator  
**ABOUT THE SIZE OF:** A postage stamp

Butterflies are excellent pollinators. As adults, these pale blue ones (*Lycia melissa samuelis*) feed from all kinds of flowers, but as caterpillars, they're very choosy. They eat only the leaves of a wildflower called the blue lupine. There are fewer and fewer places left where these flowers can thrive, so Karner blue butterflies, once found throughout the Midwest and Northeast, are now endangered.

### FIREFLY

*Bright Bug*



**CATEGORIES:** Role Model, Pollinator  
**ABOUT THE SIZE OF:** A black bean

If you've ever seen these glowing beetles, then you've witnessed bioluminescence: how some living things use chemical reactions to create light. Fireflies flash to communicate with one another and find mates, but their glow also helps medical researchers. Scientists use the gene responsible for fireflies' shine to track how cells move and develop.

### BLUE MUD WASP

*Spider Stalker*



**CATEGORIES:** Predator, Pollinator  
**ABOUT THE SIZE OF:** A paper clip

These metallic blue insects eat flower nectar, but their babies require a high-protein diet of other bugs and spiders. The wasp moms will grab spiders — including venomous black widows — sting them so they can't move and bring them back to their nests. There, the newly hatched wasp larvae eat the spiders alive.

### BUMBLEBEE

*In Demand and in Danger*



**CATEGORIES:** Pollinator, Human Helper  
**ABOUT THE SIZE OF:** A lima bean

Bumblebees' fuzzy bodies pick up pollen as they fly from flower to flower. Without them, farmers wouldn't be able to grow many of the fruits and nuts people eat. But many of these fuzzballs are in trouble, like rusty patched bumblebees (*Bombus affinis*). Habitat loss, pesticides, disease, climate change and competition with invasive honeybees have caused populations to plummet.

### WALKING LEAF

*Master of Camouflage*



**CATEGORY:** Role Model  
**ABOUT THE SIZE OF:** A credit card

The walking leaf, and its cousin, the walking stick, are really good at hiding in plain sight. Predators pass right by them because they blend in so well. Some species even have little spots that make it look as if they've been nibbled on by bugs, and they rock back and forth when they walk like leaves swaying in the breeze.

### CHOCOLATE MIDGE

*Candy Maker*



**CATEGORIES:** Pollinator, Human Helper  
**ABOUT THE SIZE OF:** The head of a pin

If you love chocolate, you've got these tiny flies to thank. Seeds from the flowers of the cacao tree are the main ingredient in chocolate. These midges seem to be the only animals able to fertilize cacao flowers so that the next generation of cacao trees will be able to grow. Without chocolate midges, there might not be any chocolate at all!

### DUNG BEETLE

*Poop Patrol*



**CATEGORY:** Decomposer  
**ABOUT THE SIZE OF:** A half-dollar coin

Dung beetles' No. 1 food is... No. 2. Some species take it "to go" by rolling it into a ball, some build their nests under it and others simply live in it. Their dining habits might sound gross, but be glad they're so hungry. Dung beetles do cleanup duty for lots of the doody out there, and they help return the nutrients in poop back to the soil.

### GRASSHOPPER

*Acrobatic Snack*



**CATEGORY:** Human Helper  
**ABOUT THE SIZE OF:** A macaroni noodle

For millions of people around the world, insects like grasshoppers (*Sphenarium purpurascens*, shown above) are a delicious source of protein. Farming insects is also easier and better for the planet than raising livestock like cows and pigs. Roasted and seasoned chapulines are popular in Mexico for their nutty flavor. Not ready to eat a whole bug? You can try cookies or chips made with ground-up cricket flour.

### FLESH-EATING BEETLE

*The Undertaker*



**CATEGORIES:** Decomposer, Human Helper  
**ABOUT THE SIZE OF:** A Tic Tac

Don't worry, flesh-eating (dermestid) beetles don't eat things that are alive. They are one of many insects that help the planet by eating the bodies of dead animals. Some natural-history museums keep colonies of them to clean the bones of animals used in scientific research. And forensic scientists can figure out how long a body has been dead by looking for how much has been eaten by dermestid beetles.

### LEAFCUTTER ANT

*Tiny Farmer*

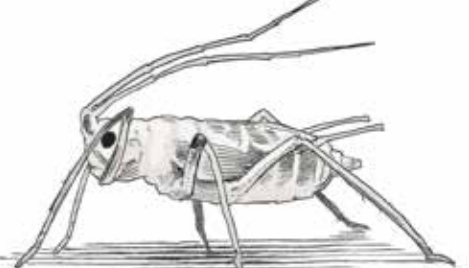


**CATEGORY:** Role Model  
**ABOUT THE SIZE OF:** A grain or two of rice

If there's one thing to know about leafcutter ants (like *Atta cephalotes*), it's that they're hard workers. After using their jaws to saw off bits of leaves, they carry the pieces back to their nests. The leaf fragments sometimes weigh 50 times more than the ants — so that's like a human carrying an elephant! Once they've arrived back home, the ants feed the leaves to a crop of fungus, their favorite food source.

### APHID

*Littlest Livestock*



**CATEGORY:** Predator (of plants!)  
**ABOUT THE SIZE OF:** The head of a matchstick

Aphids are "true bugs" — members of a group of insects called Hemiptera with mouthparts perfect for piercing plant tissues and sucking out the juices. When aphids drink sap from plants, they release a sugary fluid called honeydew. Some ants love to eat this honeydew. In fact, they even raise and protect the aphids like livestock.

### STINK BUG

*Worst-Smelling*



**CATEGORY:** Role Model  
**ABOUT THE SIZE OF:** A dime

When stink bugs want to keep predators away, they emit a smelly chemical. This funky scent has been described as similar to cilantro or burned tires. Their main predators are birds, lizards and other insects, but they're not picky about unleashing their odor. So if you come across one, don't pick it up unless you want to smell their stink.

### DRAGONFLY

*Eyes in the Skies*



**CATEGORY:** Predator  
**ABOUT THE SIZE OF:** The palm of a grown-up's hand

Huge multisided eyes let dragonflies see in almost 360 degrees and spot even fast-moving targets. That makes them deadly hunters of their fellow flying insects, including mosquitoes. A single dragonfly can eat dozens of mosquitoes every day. Dragonflies are often seen around ponds and rivers because their larvae live in the water.

### YELLOW GARDEN SPIDER

*Pest Control*



**CATEGORIES:** Predator, Human Helper  
**ABOUT THE SIZE OF:** An almond

OK, we know: Spiders aren't insects — they're arachnids. But they play an important part in keeping insect populations in balance. They've evolved all sorts of fascinating ways to catch their prey, including sticky webs and paralyzing venom. Most spiders (like this *Argiope aurantia*) are harmless to humans, so it's best to leave them be and let them keep catching mosquitoes and flies!

### GIANT SILK MOTH

*Dreamy Weaver*



**CATEGORY:** Role Model  
**ABOUT THE SIZE OF:** A grown-up's hand

North America's largest moths (*Hyalophora cecropia*) have strange patches on their wings that at first glance look like eyes. These eyespots are thought to help defend the moths from predators. They fool other animals into thinking that they're bigger, scarier critters than they really are or trick attackers into aiming for the "eyes" at the edges of their wings rather than targeting their bodies.

### TERMITE

*Wood Destroyer*



**CATEGORY:** Decomposer  
**ABOUT THE SIZE OF:** A grain of rice

Most animals can't digest the tough cellulose in wood. But termites have special microorganisms in their guts that allow them to chew down without a problem. If they are eating the wooden beams in a house, they're awful pests. Out in the forest, though, they're very helpful at getting rid of decaying logs.

### BOMBARDIER BEETLE

*Most Explosive Personality*



**CATEGORY:** Predator  
**ABOUT THE SIZE OF:** An almond

Trust us, you don't want to startle these ground beetles. Glands in their bodies produce different chemicals and compounds. If a bombardier beetle feels threatened, it will spray them at its predators. When they combine, they explode. In other words, it shoots clouds of hot chemicals out of its butt.

### COCKROACH

*Cleanup Crew*



**CATEGORY:** Decomposer  
**ABOUT THE SIZE OF:** A grown-up's thumb

You might not want them in your kitchen, but cockroaches are actually helpful. They eat rotten materials like old leaves, returning their nutrients to the earth. Smaller city cockroaches will eat just about anything, but many species, including the massive Madagascar hissing cockroach (*Gromphadorhina portentosa*), are mostly vegetarians. Some people keep these giant insects as pets.

### LADYBUG

*Farmers' Friend*



**CATEGORIES:** Predator, Pollinator, Human Helper  
**ABOUT THE SIZE OF:** A chocolate chip

They might look cute, but these beetles are ferocious hunters of smaller plant-eating bugs like aphids (see Specimen No. 8). Because they eat pest insects, they're loved by farmers and gardeners. Fun fact: When California's citrus crops were being destroyed by invasive Australian bugs in the 1880s, imported Australian ladybugs helped save the day by gobbling up the pests.

### MOSQUITO

*Bloodsucker*



**CATEGORIES:** Pollinator, Predator  
**ABOUT THE SIZE OF:** An apple seed

Mosquito moms need blood to produce healthy eggs, which is why they bite people and animals. (That means it's always females that cause itchy red bumps and spread diseases.) But mosquitoes do good stuff too. When they drink the nectar from flowers, they pollinate them. People who live in New York and New Jersey and like to look at wild orchids have *Aedes communis* mosquitoes to thank.

### CADDISFLY

*Most Bling*



**CATEGORIES:** Human Helper, Role Model  
**ABOUT THE SIZE OF:** A pen cap

Some caddisfly larvae live in streams. They create protective cases out of pebbles, holding them together with their ultrasticky silk. Scientists hope the silk, which stays sticky when wet, might help us invent better ways to seal together tissues during surgery. Caddisflies' helpfulness doesn't stop there: Certain types don't live in highly polluted areas, so their presence in a waterway hints that it is clean.

### GIANT WATER BUG

*Underwater Assassin*

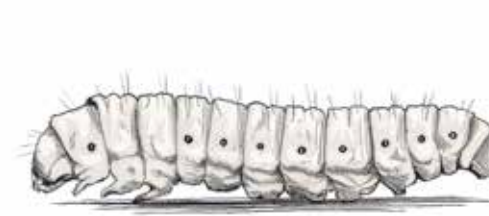


**CATEGORY:** Predator  
**ABOUT THE SIZE OF:** A credit card

Giant water bugs tip themselves headfirst into water, breathing through a snorkel-like tube on their rear end. They then lie in wait until prey — including small fish, tadpoles and even baby turtles and ducklings — swim by. In a flash, the water bugs snatch their prey with their powerful forelimbs, stab it with their pointed mouthparts, inject it with liquefying compounds and suck out the innards like a smoothie.

### WAXWORM

*Nature's Recycler*



**CATEGORY:** Role Model  
**ABOUT THE SIZE OF:** A macaroni noodle

Before they turn into wax moths, these caterpillars feed on beeswax. That's bad news for bees, who probably wish the worms would leave their hives alone, but potentially great news for humans. Scientists have discovered that the waxworms' ability to eat wax also makes them one of the few animals that can eat plastic. This might help scientists find ways to break down plastic trash polluting the planet.

### WATER STRIDER

*Unsinkable Stalker*



**CATEGORY:** Predator  
**ABOUT THE SIZE OF:** A sewing needle

These bugs can walk on water. Their long, skinny legs help them to distribute their body weight across a wider area, so they don't sink. And their bodies are covered with water-repellent microhairs that keep splashes of water from weighing them down. They feed on insects and spiders that have fallen onto the surface of the water and can't get back up. Some species even live on the surface of the ocean.

### ORCHID MANTIS

*Dressed to Kill*



**CATEGORY:** Predator  
**ABOUT THE SIZE OF:** A ketchup packet

At first glance, the female orchid mantis (*Hymenopus coronatus*) looks like a pretty flower. Butterflies and bees are hungry for nectar are attracted to her colors and petal-like appendages. When they come near, the stealthy praying mantis uses her powerful front legs to snag the prey and then gobble it up.