



Wonderful

Wasps

These zippy, colorful insects deserve a closer look.

Wasps are fascinating and beautiful winged insects. They come in many shapes, sizes, and colors. There are more than 100,000 species, or kinds, of wasps worldwide.

STEPHEN MAXSON

Though female wasps can sting, most wasps are gentle. Some are stingless. You might call wasps good neighbors because they control insect pests, pollinate plants, and provide food for wildlife.

Many wasps start flying in the spring or early summer when the weather grows warm. Have you seen any wasps in Minnesota this year? Take a look at the photographs in this story. You might see some insects that you didn't know were wasps!



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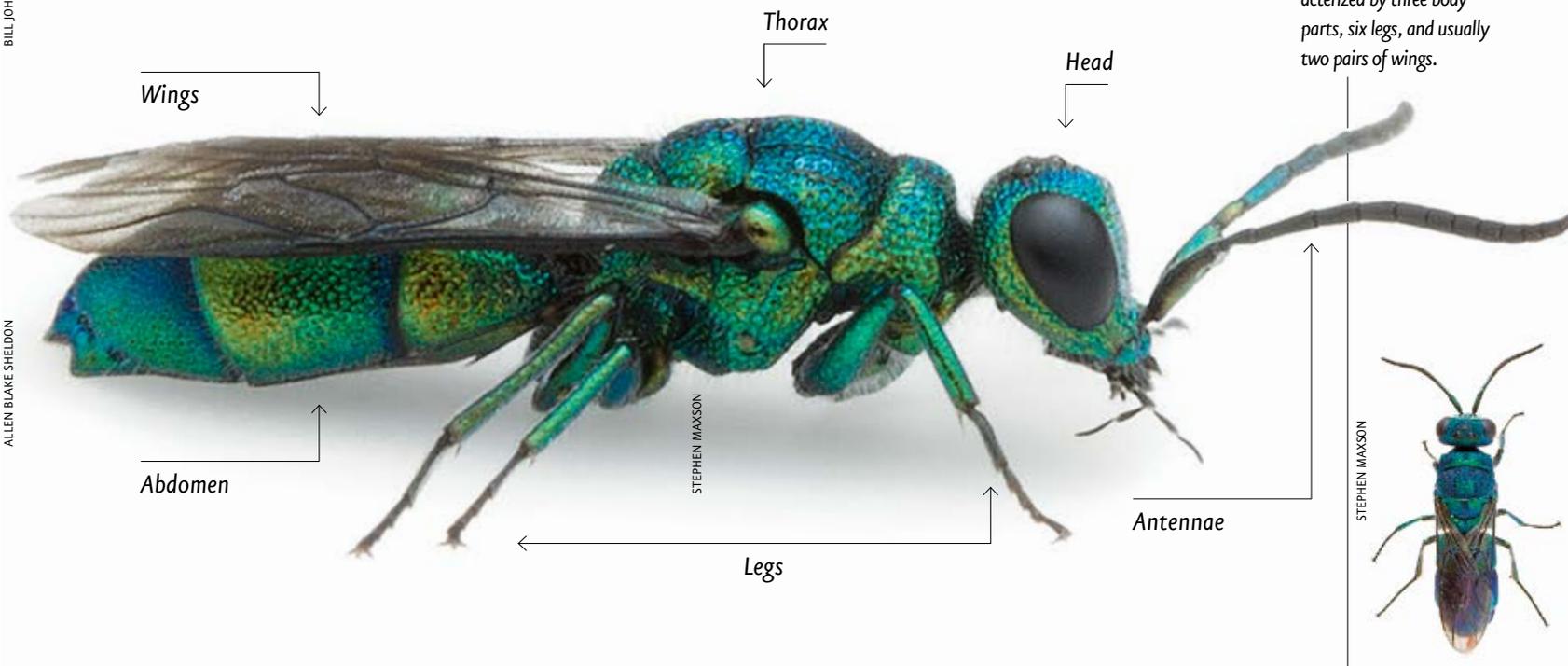


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ALLEN BLAKE SHELDON

From top to bottom:
A great black wasp visits
milkweed. Square-headed
wasps are solitary species.
A cicada killer wasp hauls
a cicada to an under-
ground burrow.



Insects, such as this cuckoo wasp, are characterized by three body parts, six legs, and usually two pairs of wings.

Beautiful Bodies

Wasps are a type of insect. Like all insects, a wasp has three main body parts: head, thorax, and abdomen. A wasp has six legs, four wings, and two antennae.

Some wasps have unusual names that reflect their shape. Imagine the square-headed wasp (*Ectemnius* species) or thread-waisted wasp (*Ammophila* species). A tiny parasitic wasp can be smaller than the period at the end of this sentence. The

eastern cicada killer (*Sphecius speciosus*) grows up to 2 inches long. It hunts for cicadas but usually avoids people. These gentle giants may look scary when they're flying, but they're actually mild-mannered and keep to themselves, unless they're captured and poked or prodded.

Wasps come in a rainbow of colors. Cuckoo wasps (Chrysididae) are often shiny green. You might recognize the black

and yellow stripes of yellowjackets (*Vespa* species). Paper wasps (*Polistes* species) have reddish-brown spots. Have you noticed the blueish-purple shimmer of great black wasps (*Sphex pensylvanicus*)?

Close Cousins

Wasps and bees are related but behave differently. Wasps are carnivores, or meat eaters, that hunt caterpillars, flies, and other prey for food. Bees are vegetarians. They

get protein by collecting pollen, which is like a fine dust that flowers use to reproduce. Bees feed pollen to their young.

It's easy to confuse bees and wasps, but some clues can help you to tell them apart. Wasps often look smooth and bald. Most bees have visibly fuzzy bodies and heads. If you look closely, you can see that both actually have hairs. A bee has branched hairs, which look feathery and help bees to collect pollen. Wasps don't collect pollen, so their hairs have remained straight.



PHOTOS BY BILL JOHNSON

Paper wasps are social and work together to build a nest. Unlike yellowjackets, paper wasps leave the cells of the nest uncovered.

Roommates

Some wasps are *social*. They live in large groups with their relatives and are led by a queen. Workers share responsibilities for tending the nest, raising young from eggs laid by the queen, and hunting for food. Yellowjackets, paper wasps, and hornets are all social species of wasps.

Yellowjacket is the common name for two groups of species (*Vespula* and *Dolichovespula*). These wasps build large paper nests. You might see a round, gray nest hanging in a tree, but others may be hidden underground or built inside a structure like the walls of a house. A yellowjacket nest starts with just one queen in the spring. It grows to hundreds or thousands of wasps by the end of the summer.

No true hornets are native to Minne-

sota. We have one species called the bald-faced hornet (*Dolichovespula maculata*), but this black-and-white insect is really a yellowjacket. Like true hornets, this species builds its nest in trees.

Paper wasps (*Polistes* species) are also social. You can tell them apart from yellowjackets by their skinny thread waist and long legs that dangle down when they fly. Paper wasps build small nests that often hang from the underside of tree branches or the eaves of a house. Unlike yellowjackets, they leave the nest open so you can see the six-sided cells inside. This gives the nest a curved shape, so these wasps are sometimes called umbrella wasps. Paper wasp nests grow to include about 50 or 60 wasps by the end of the summer.



Solitary wasps, such as grass-carrying wasps, build their own nests and live alone.

Living Alone

Wasps that live alone are called *solitary*. One adult female starts a nest and lays her eggs. She hunts for other insects to eat and leaves some of them behind for the baby wasps, called larvae, to eat when they hatch. Mud daubers (Sphecidae and Crabronidae) build a nest using mud, then stuff it with spiders or other prey, which they paralyze by stinging.

Grass-carrying wasps (*Isodontia* species) move into cavities in wood. They bring home tree crickets or other prey, lay eggs in separated chambers, then seal the eggs inside by plugging the entrance with grass. Some solitary wasps move into the nesting blocks that people put out for solitary bees. Like good neighbors, bees and wasps can live next to each other.



Bald-faced hornets hunt other insects, including flies and yellowjackets.



Cuckoo wasps have textured, shiny bodies. This wasp has a red mite attached to its abdomen.



Great black wasps hunt katydids.



Peleciniid wasps use their long abdomens to lay eggs in the larvae of June bugs that live underground. These wasps have no stinger.

Wildly Different Wasps

Wasps come in many shapes, sizes, and colors. Wasps hunt for a wide variety of other insects, and they can be beneficial when they eat crop-destroying bugs such as grubs and caterpillars.

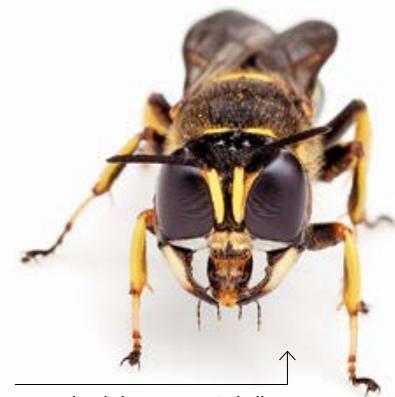
PHOTOS BY STEPHEN MAXSON



Yellowjackets are compact and stocky.



Paper wasps are long and thin, and their legs dangle when they fly.



Square-headed wasps nest in hollow stems and wood cavities.



LEFT AND RIGHT: PHOTOS BY ALLEN BLAKE SHELDON

Yellowjackets work together to build their nests, which can be quite large.

Circle of Life

Many social wasps start their nest in the spring, but people begin noticing them in August or September, after the nest has grown in size. The queens mate in late fall and fly away to overwinter in sheltered places, such as underneath tree bark. The males and female workers die from cold after the first hard frost.

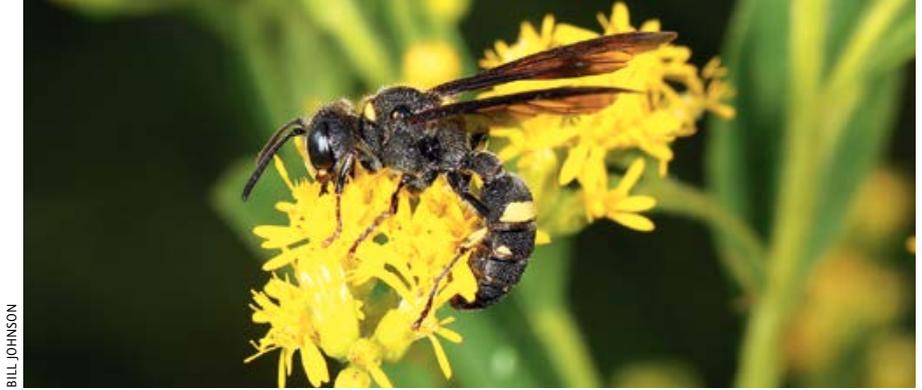
By early winter, the wasp nest is empty. Wasp nests are used for only one season, so if you find one after a hard frost you can bring it inside. It's fascinating to examine its complex structure.

In the spring, the queen emerges from her winter shelter and finds a place to build her new nest. She scrapes pulp from

dead wood and starts building six-sided paper cells. Then the queen begins laying eggs. Fertilized eggs become females and unfertilized eggs become males.

The eggs hatch into *larvae*. Female wasps hunt for prey, chew them up, and feed these liquefied insects to the larvae. When larvae are ready to become *pupae*, they spin a silk cap over their cell. They rest in this stage until they emerge as an *adult*. This four-part life cycle is called *complete metamorphosis*.

Many solitary wasps, on the other hand, spend the winter as *prepupae*. They finish growing the next spring or summer. Then they emerge as adults, mate, and lay eggs, and begin the cycle again.



BILL JOHNSON

The smoky winged beetle bandit wasp hunts for wood-boring beetles, including the invasive emerald ash borer beetle.

Beneficial Bugs

Wasps are *beneficial insects*. They do things that people think are important. For example, some wasps are *predators* that protect crops and gardens by hunting insect pests. Paper wasps (*Polistes* species) hunt caterpillars, which helps to protect garden plants and ornamental flowers.

Other wasps are *parasitoids*. They lay their eggs inside or on other insects. The eggs hatch into larvae that develop inside their hosts, eventually emerging as adult wasps. Host insects do not survive. One parasitoid wasp is *Aphelinus certus*. It was first documented in Minnesota in 2011, and it lays its eggs inside soybean aphids. This kills the aphids and helps soybean farmers to grow healthier crops.

Wasps can also protect our natural environment. A stingless wasp (*Tetrastichus planipennis*) is a parasitoid of the emerald ash borer, an invasive insect that damages ash trees. These wasps have been released at places including Great River Bluffs State Park, and they help to protect nearly 1 bil-

lion ash trees in Minnesota. The smoky winged beetle bandit wasp (*Cerceris fumipennis*) hunts for metallic wood-boring beetles, including the emerald ash borer. Tracking this wasp helps to track the invasive beetle. You can work with the Wasp Watchers program to report sightings or monitor colonies in your community. This wasp often nests in baseball diamonds.

Wasps also provide food for wildlife. Hungry animals like bears, skunks, and raccoons are attracted to wasp nests that are filled with young, protein-rich larvae. Birds, spiders, and other animals eat adult wasps.

Finally, wasps are *pollinators*, helping plants reproduce by spreading pollen from one flower to the next. They aren't as efficient as their relatives the bees, but wasps can accidentally pick up pollen when they're drinking nectar from flowers. Humans are grateful for pollinators. They help provide tasty fruits and vegetables to eat, colorful flowers to brighten our day, and habitat for wildlife.



PHOTOS BY STEPHEN MAXSON

A bald-faced hornet has white markings that contrast with its black body. One bald-faced hornet nest may have 400 workers.



Yellowjacket larvae (above left) grow inside paper cells. By late summer the number of yellowjacket workers (above right) can grow to 4,000. Yellowjackets will not continue to use the nest if it is relocated. It's best to leave them alone.

Stings

Did you know that male wasps can't sting? Only female wasps have a stinger. Unlike honey bees (*Apis mellifera*) that can sting only once, most wasps can sting multiple times. Wasps sting mainly when they're provoked, defending their nest, or accidentally trapped in your clothing.

Social wasps are responsible for most stings. And boy, can they be painful! Social wasps, like bald-faced hornets, can afford to be aggressive because they live in large groups. If a social wasp dies while defending her nest from threats such as humans or bears, her sisters will care for the young. Being aggressive might be a good gamble.

Solitary wasps are more reluctant to sting. They have much more at stake. If a solitary wasp is killed while defending her nest, her young will be all alone. She won't be able to finish their nest or lay more eggs. Some solitary wasps, like peleciniid wasps (*Pelecimus polyturator*), don't even have a stinger.

If you're at a picnic, you might see wasps searching for protein from meat or carbohydrates from sugary beverages. This can be a little scary. It's best to stay calm and move slowly. Wash your hands when you're done eating. The wasps will move on to find food somewhere else.



Approach with Caution

Some people may feel nervous if there's a wasp nest nearby. If you need to remove a wasp nest, please take precautions or call an exterminator. Active wasp nests can't be relocated.

However, please leave wasp nests alone whenever you can. Wasps provide many

benefits, such as controlling insect pests, pollinating flowers, and providing food for wildlife. And if you keep a safe distance, wasp behavior can be captivating to watch. This summer, maybe you'll discover and identify some wasps that live near you. 🍷

TEACHERS RESOURCES

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