

Insects

A Compare and Contrast Book



by Aszya Summers

Insects

A Compare and Contrast Book

Did you know that there are more insects than any other group of animals? The diversity of insects is staggering. What do ants have in common with bees? What's the difference between a butterfly and a moth? How are ladybugs and weevils related? Some insects have a set of wings, some have two sets but others might not have any. Some, but not all, insects have a hard outer shell (exoskeleton). Learn how insects are alike and how they are different in this latest addition to the Compare and Contrast Series.

Arbordale Publishing offers so much more than a picture book. We open the door for children to explore the facts behind a story they love.

The *For Creative Minds* includes

- Match the Insect "Cousins"
- Insect Scavenger Hunt
- Insect Life Cycles
- Complete or Incomplete Metamorphosis?

Thanks to Ian McAreavy, Lead Entomology Specialist at the Museum of Life and Science, for reviewing this book for accuracy.

Arbordale's interactive ebooks read aloud in both English and Spanish with word-highlighting and adjustable audio speed. Available for purchase online.

Aszya (pronounced Asia) **Summers** has been in the zoo and aquarium field for ten years and has been working with animals in some capacity for over 15 years. After graduating from the University of Wisconsin-Madison with degrees in zoology and environmental studies, she spent time working at aquariums in North and South Carolina and with the International Crane Foundation, before spending six years at the Racine Zoo overseeing the education and animal care departments. She now works as the Grant Writer at Lincoln Park Zoo, working with dozens of educational and conservation programs. She has also written Arbordale Publishing's *Birds: A Compare and Contrast Book*. Aszya and her partner have their own small "zoo" of four cats, a bird, and a snake.



Aszya Summers

A note for parents and caregivers

Helping young children develop critical thinking skills is a gift they'll have for life. The book you are holding can help you to help them do just that.

Before reading the book, ask the child(ren) how they think these animals are alike or different. That helps you to understand what they already know or if they have any misconceptions.

After reading, go back through the book together looking at photos to find and discuss things. Ask verbal children to describe or explain what they see. Even young, non-verbal children can find and point to things. For example, have children find or point to:

- the main 3 body parts of each insect
- wings/no wings
- colors and patterns
- antennae or eyes

Ask the child(ren) to describe one new thing they learned or found most interesting.

Do the "For Creative Minds" activities in the back of the book with them.

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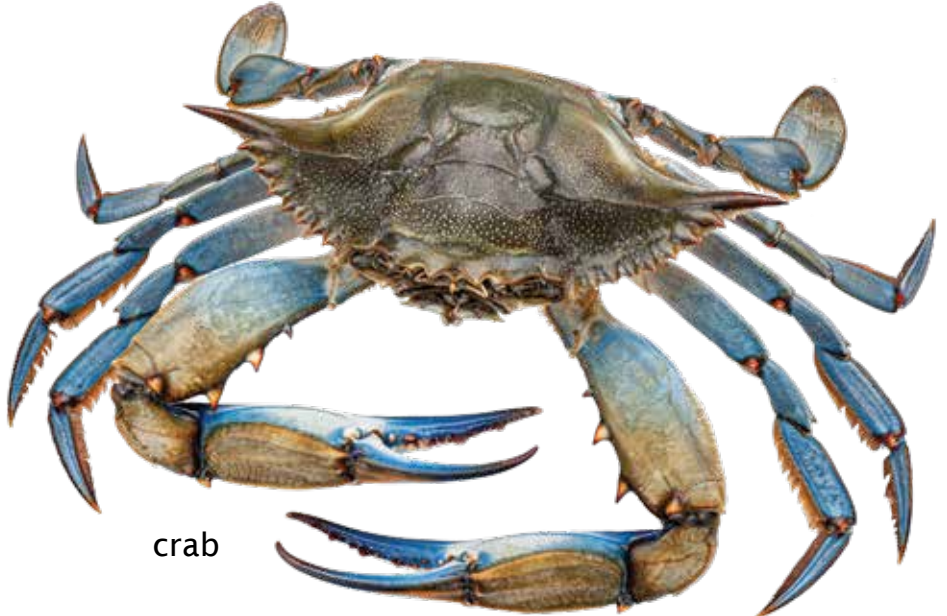
by Aszya Summers



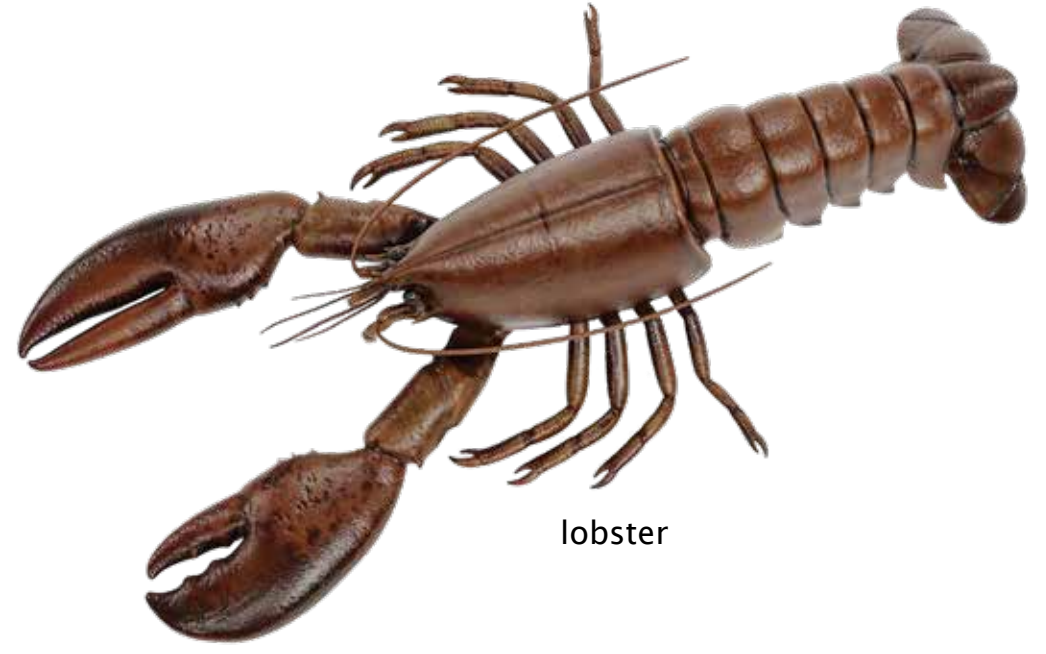
Many people think that you need to travel to far off places to see amazing animals. But did you know that some of the most diverse animals live in your own backyard?

Believe it or not, there are more insects than any other group of animals. In fact, between 70% and 90% of all animal species known to humans are insects.

Insects, like crabs and spiders, are arthropods. Unlike mammals, birds, fish, amphibians, or reptiles, arthropods don't have a backbone. They may have a hard outer shell (exoskeleton), a body separated into parts (segments) and pairs of legs that bend (jointed).



crab



lobster

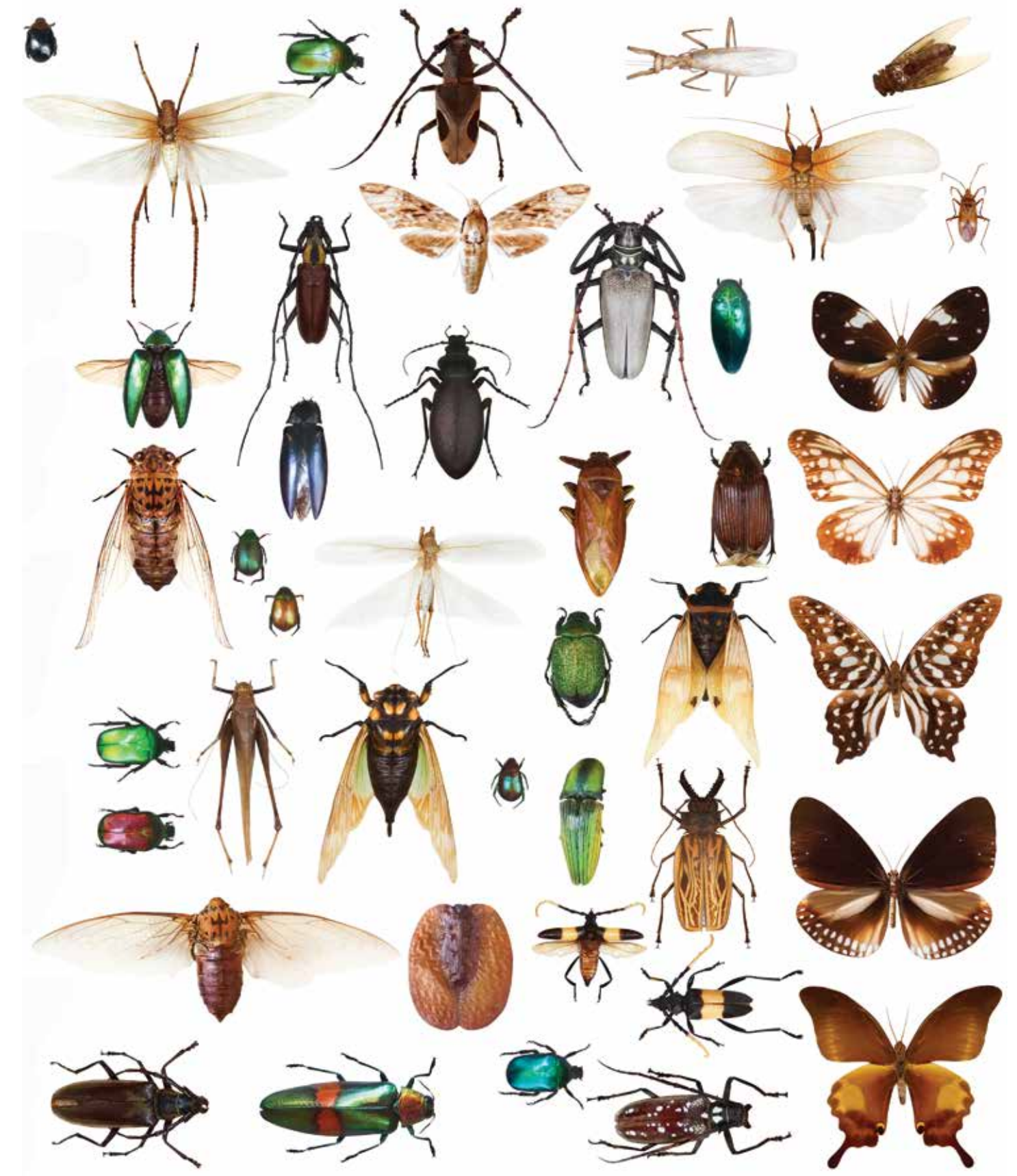


centipede



spider

insects

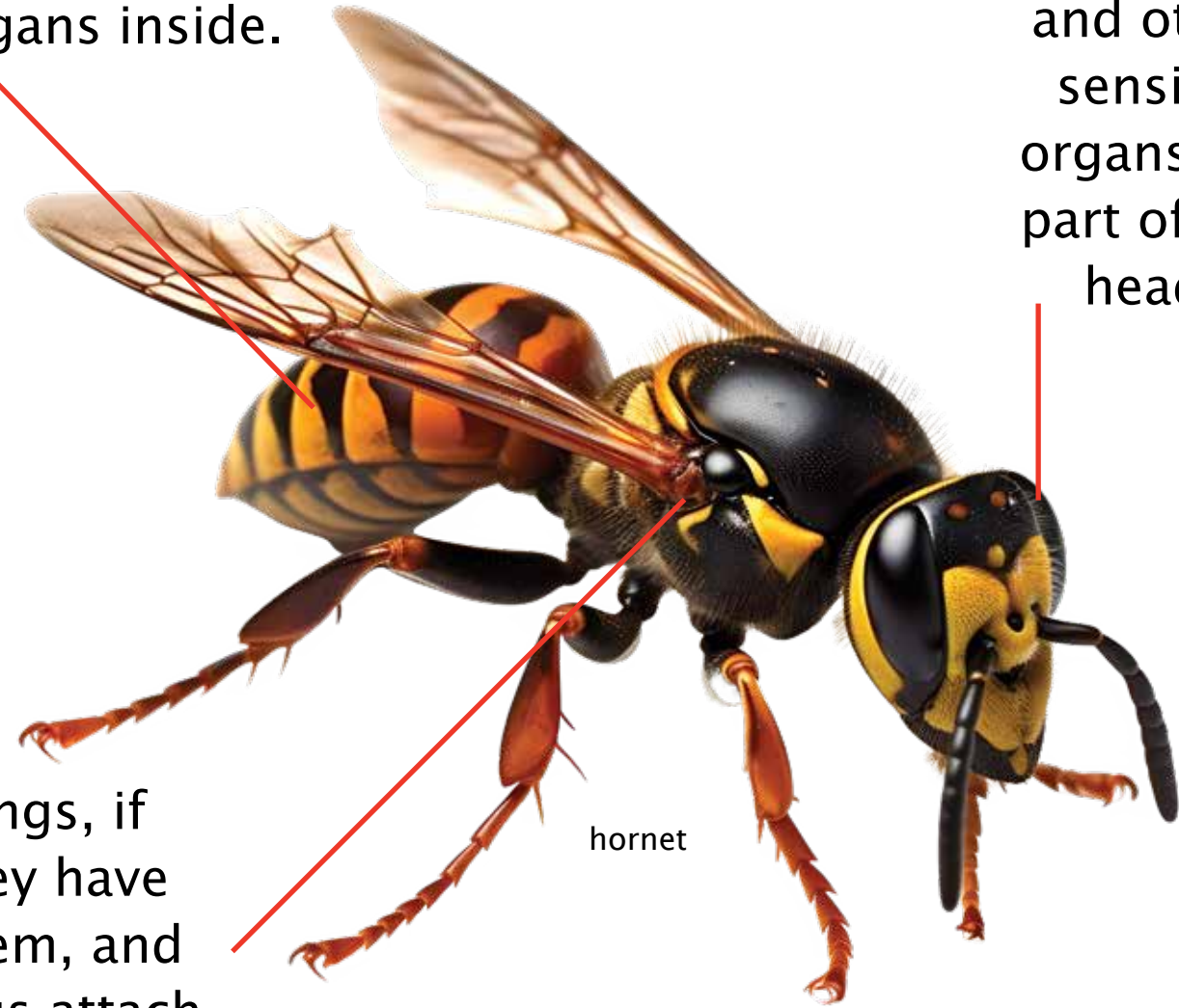


Unlike other arthropods, all insects have six legs and three segments to their body. Every insect, from butterflies to beetles, follows this body plan.

The abdomen has the insects' stomach and other organs inside.

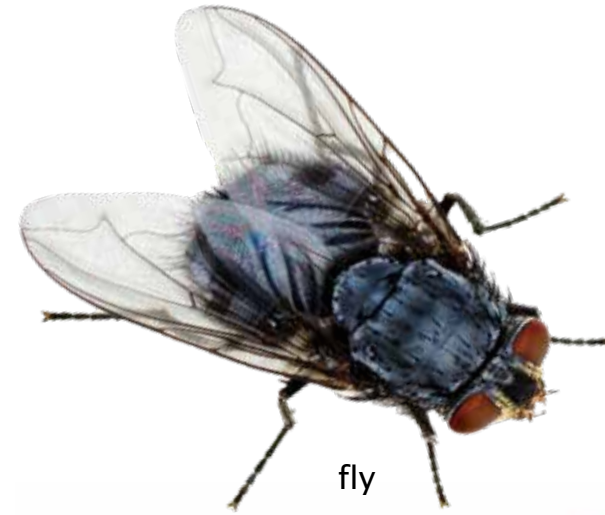
Antenna and other sensing organs are part of the head.

Wings, if they have them, and legs attach to the thorax.

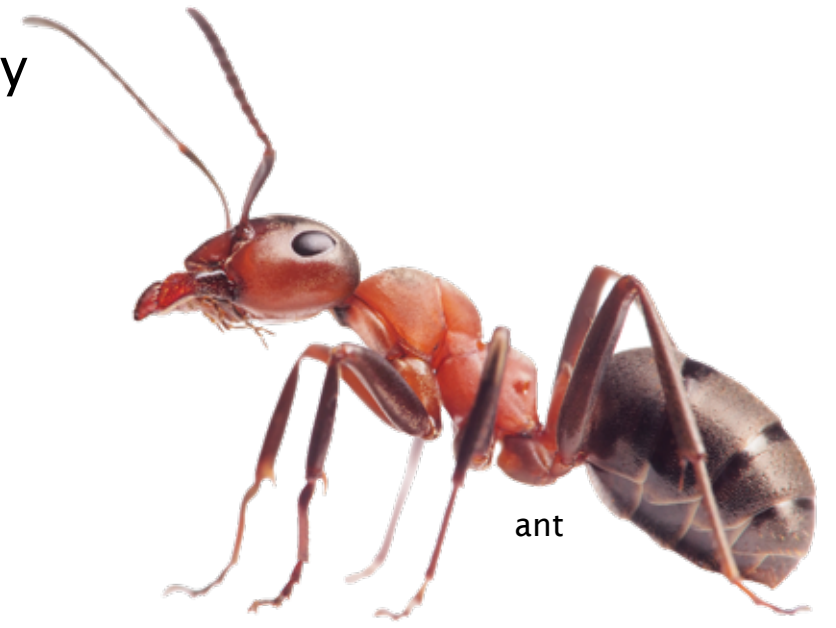


hornet

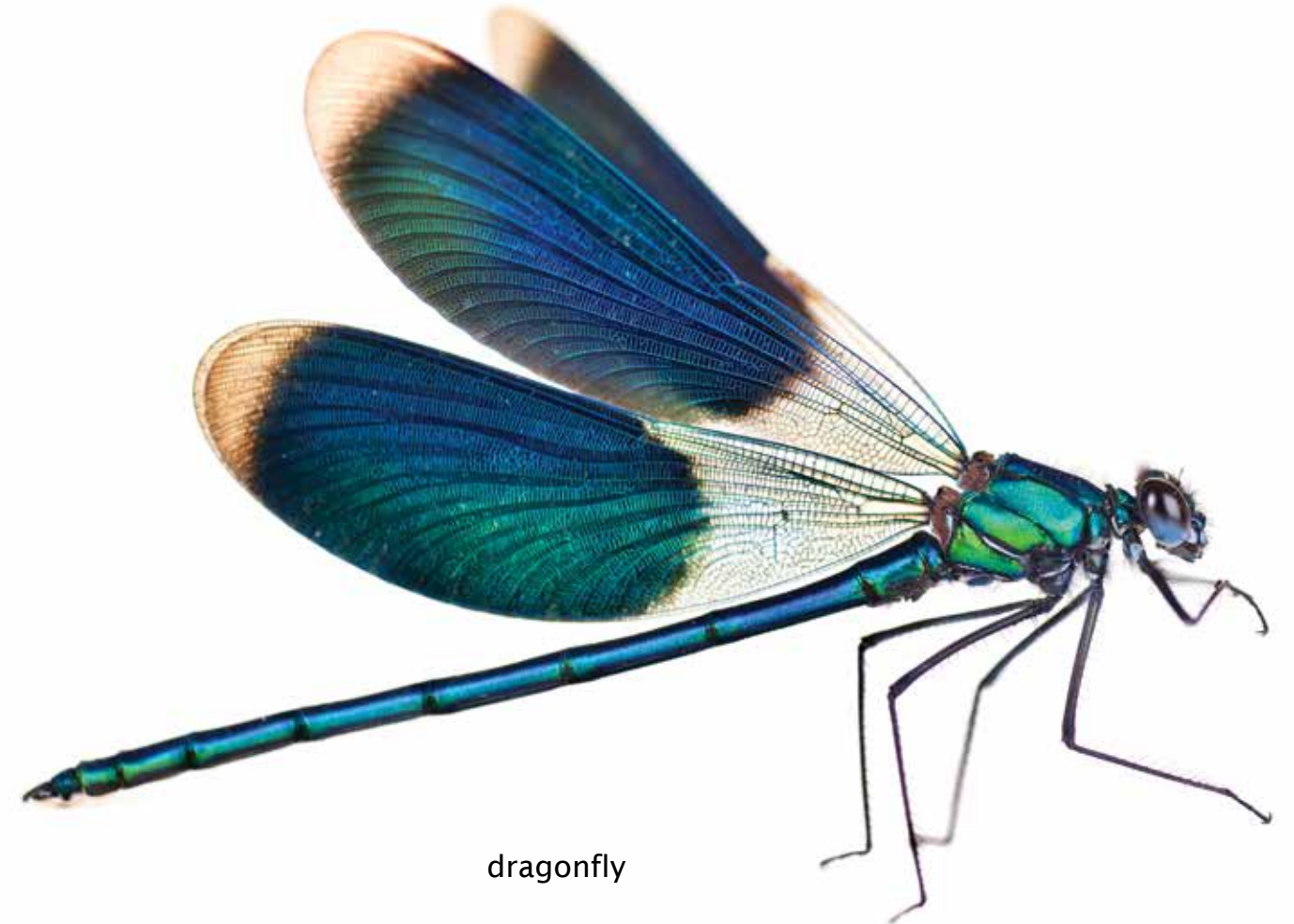
Can you find these body parts on these insects?



fly



ant



dragonfly

The largest group of insects are the beetles. Beetles have two sets of wings: a soft inner wing that folds up, and a stiff outer wing that keeps their delicate flight wing safe.

It's easy to see both pairs of wings on ladybugs.



Some beetles have crazy shapes, like this giraffe weevil. They use their long necks to roll leaves to protect their eggs.

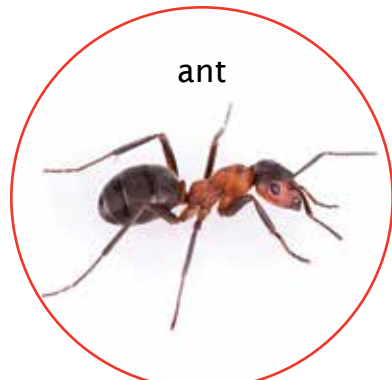

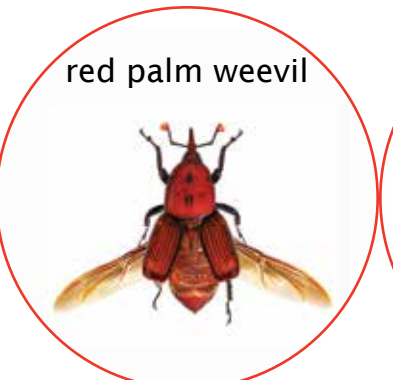
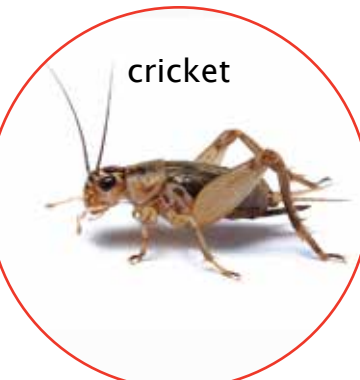


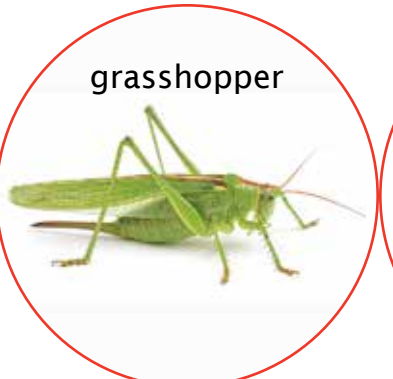
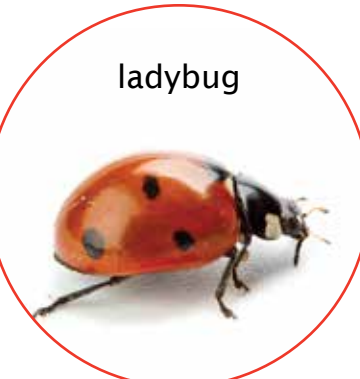
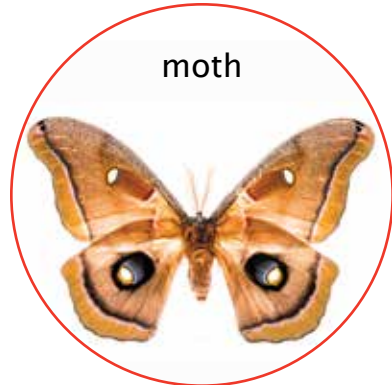

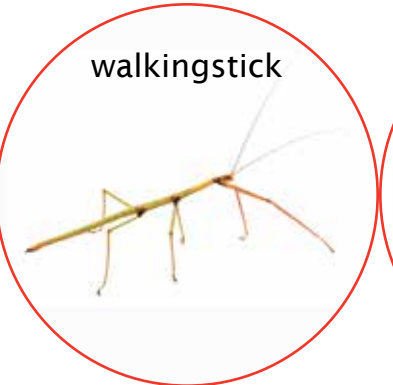



For Creative Minds

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Match the Insect “Cousins”

Using what you learned reading the book, match the insect “cousins” to each other. Insects shown are not to size.












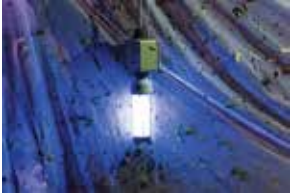
			
			
			

Answers: ant/wasp, red palm weevil/ladybug, butterfly/moth, cricket/grasshopper, damselfly/dragonfly, walking leaf/walkingstick

Insect Scavenger Hunt

They may be small and fast, but insects leave traces everywhere! Try to find as many different insect traces in your area as you can! Try looking at different times of day, or different seasons throughout the year!

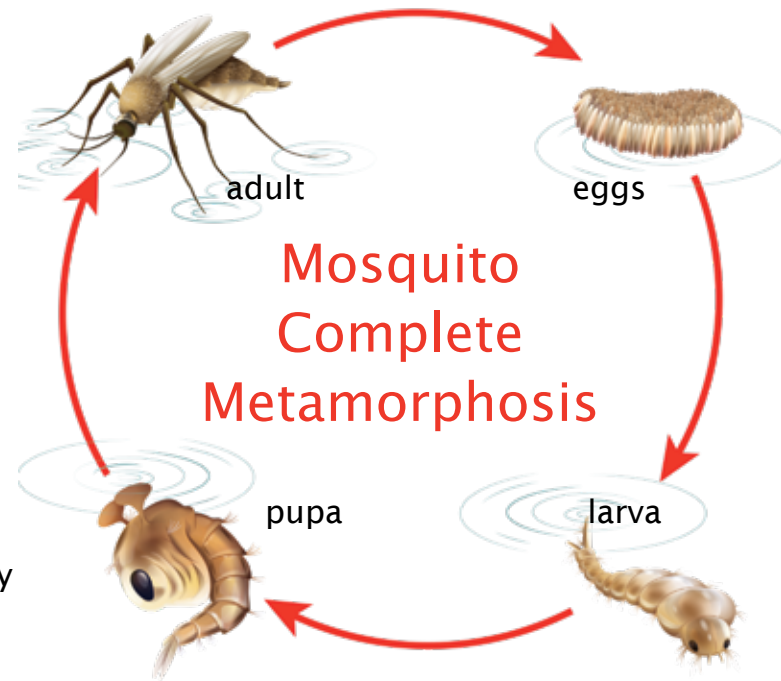
This page may be photocopied or printed from www.ArbordalePublishing.com to track insect discoveries. Feel free to have kids track the dates, time of day, or even by season.

<p>Find an anthill.</p> 	<p>Find a leaf or flower that has been eaten.</p> 	<p>Find some flowers with a bee or butterfly eating.</p> 	<p>Listen for a cricket or grasshopper.</p> 
<p>Find insects under a rock or log.</p> 	<p>Find tiny holes in tree bark.</p> 	<p>Find insects by digging in the dirt.</p> 	<p>Find a mosquito bite.</p> 
<p>Find a cicada shell or hear one calling in the trees.</p> 	<p>Find a ladybug.</p> 	<p>Find a bee or wasp nest (but don't touch).</p> 	<p>Shine a light outside at night to see what insects approach.</p> 

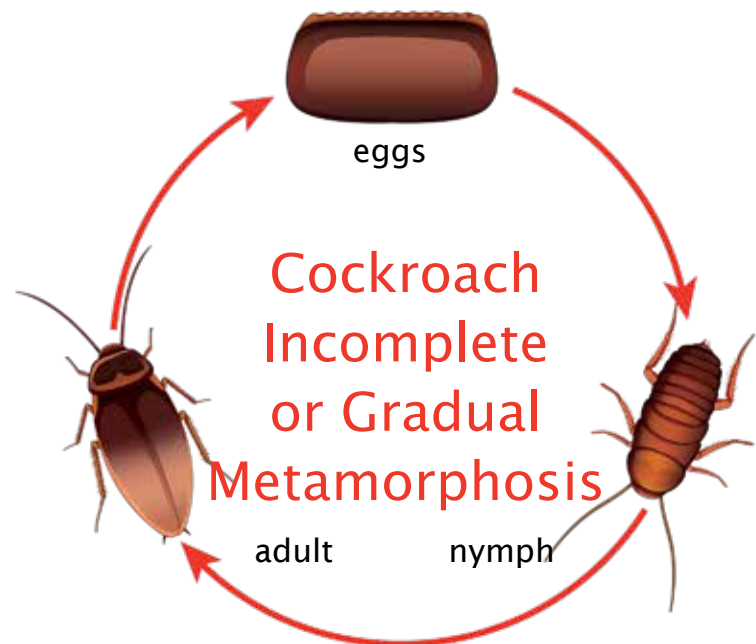
Insect Life Cycles

Depending on the type of insect, it either goes through a complete change, called metamorphosis or an incomplete or gradual metamorphosis.

- An Insect that goes through a complete metamorphosis begins its life when it hatches from an egg into a larva that doesn't look anything like the adult insect it will become.
- The larva eats and grows. In some cases, the larva adds body segments and goes through body changes (instars). As it goes through the instar levels, it molts its outer skin (exoskeleton) with a new one growing underneath. Whether a larva goes through instars or how many levels depends on the type of insect.
- At the end of the larval stage, the larva turns itself into a pupa.
- While inside the pupa, the insect's body is changing so that when it emerges from the pupa, it is a full-grown adult insect.

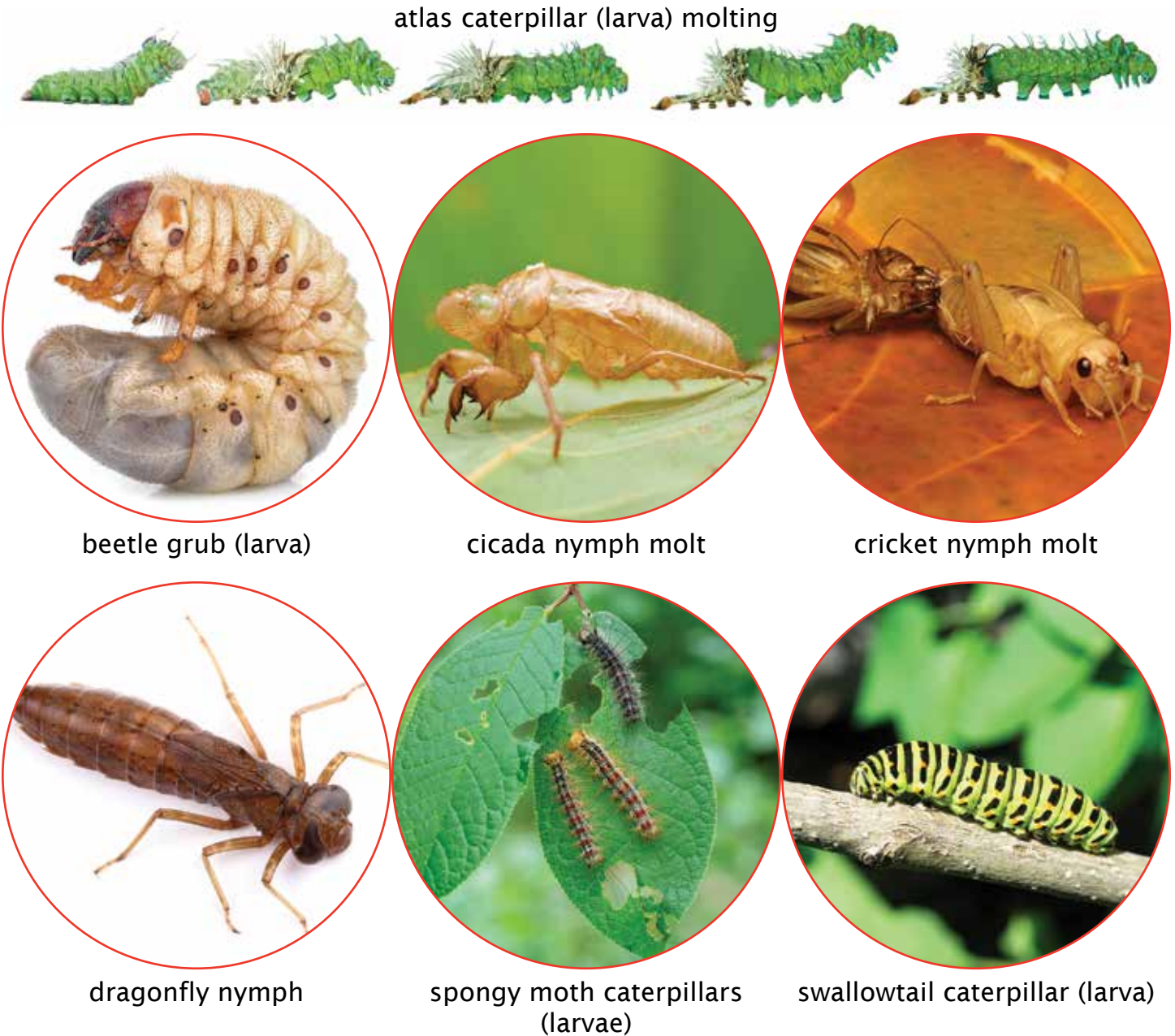


- An Insect that goes through an incomplete or gradual metamorphosis hatches from an egg into a nymph that looks like tiny versions of the adult insects but without wings.
- As the nymph grows, it molts its exoskeleton and grows a new, bigger one. A nymph will molt several times.
- By the time it has finished molting and growing, the insect has grown its wings and is an adult.



Complete or Incomplete Metamorphosis?

Based on what you learned on the previous page, see if you can determine whether the insect undergoes a complete or incomplete/gradual metamorphosis during its life cycle. Larva is singular, larvae is plural.



Did you know that a butterfly pupa is called a chrysalis and a moth pupa is called a cocoon?

Answers: Complete: Atlas caterpillar/butterfly, beetle, swallowtail butterfly, spongy moth
 Incomplete/Gradual: cicada, cricket, dragonfly

Thanks to Ian McAreavy, Lead Entomology Specialist at the Museum of Life and Science, for reviewing this book for accuracy.

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Library of Congress Cataloging-in-Publication Data

Names: Summers, Aszya, 1992- author.

Title: Insects : a compare and contrast book / by Aszya Summers.

Description: Mt. Pleasant, SC : Arbordale Publishing, LLC, [2023] | Series: Compare and contrast | Includes bibliographical references.

Identifiers: LCCN 2023054082 (print) | LCCN 2023054083 (ebook) | ISBN 9781643519920 (English paperback) | ISBN 9781638170112 (Dual-language, read along) | ISBN 9781638170303 (pdf) | ISBN 9781638170495 (epub)

Subjects: LCSH: Insects--Juvenile literature.

Classification: LCC QL467.2 .S856 2023 (print) | LCC QL467.2 (ebook) | DDC 595.7--dc23/eng/20231213

LC record available at <https://lcn.loc.gov/2023054082>

LC ebook record available at <https://lcn.loc.gov/2023054083>

Also available in Spanish: *Insectos: Un libro de comparaciones y contrastes*

Spanish Paperback 9781638173113

Spanish PDF 9781638173175

Spanish ePub3 9781638173205

The dual-language read-along is available online at www.fathomreads.com

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