

Science @ Home

BUTTERFLIES



Flutter over to this colorful collection of butterfly-themed activities, perfect for Lepidoptera lovers ages 4-8.

Fragile yet fearless, pint-sized yet widespread, butterflies are marvels of nature, transforming from lowly caterpillars into majestic beauties through the mysterious process of metamorphosis. Take flight with these winged wonders through a variety of videos, crafts, and interactive programs.

Please note: While Science @ Home activities are designed to be conducted by kids, some little ones might need adult help with reading instructions and preparing crafts.

Day 1: Winging It

45-60 minutes

- » Butterfly Am I (video)
- » A Bola Full of Butterflies (video)
- » Dazzling Hatchlings (video)
- » Magical Metamorphosis (craft)

Day 2: I Spy Butterflies

30-90 minutes

- » Butterfly Camouflage (video)
- » Butterfly Mimicry (video)
- » Color a Butterfly (coloring)
- » Giga Macro Sunset Moth (activity)
- » Giga Macro Comet Moth (activity)

Day 3: What Makes a Butterfly an Insect?

30-60 minutes

- » Butterfly Aria (video)
- » Invent an Insect (activity)

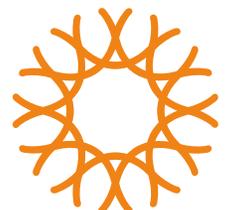
Day 4: Curious About Color

30-45 minutes

- » The Brilliant Blue Morpho (video)
- » Exploring Iridescence (video)
- » Iridescent Ice (activity)

Extension Activities

- » Shimmer and Shine (activity)
- » Butterfly Journey (video)
(Spanish with English subtitles)
- » Monarch Migration (video)
(Spanish with English subtitles)
- » Butterfly Genome (video)





Magical Metamorphosis

Materials

Butterfly print-out (page 2)

Scissors

Crayons, markers, colored pencils, or stampers

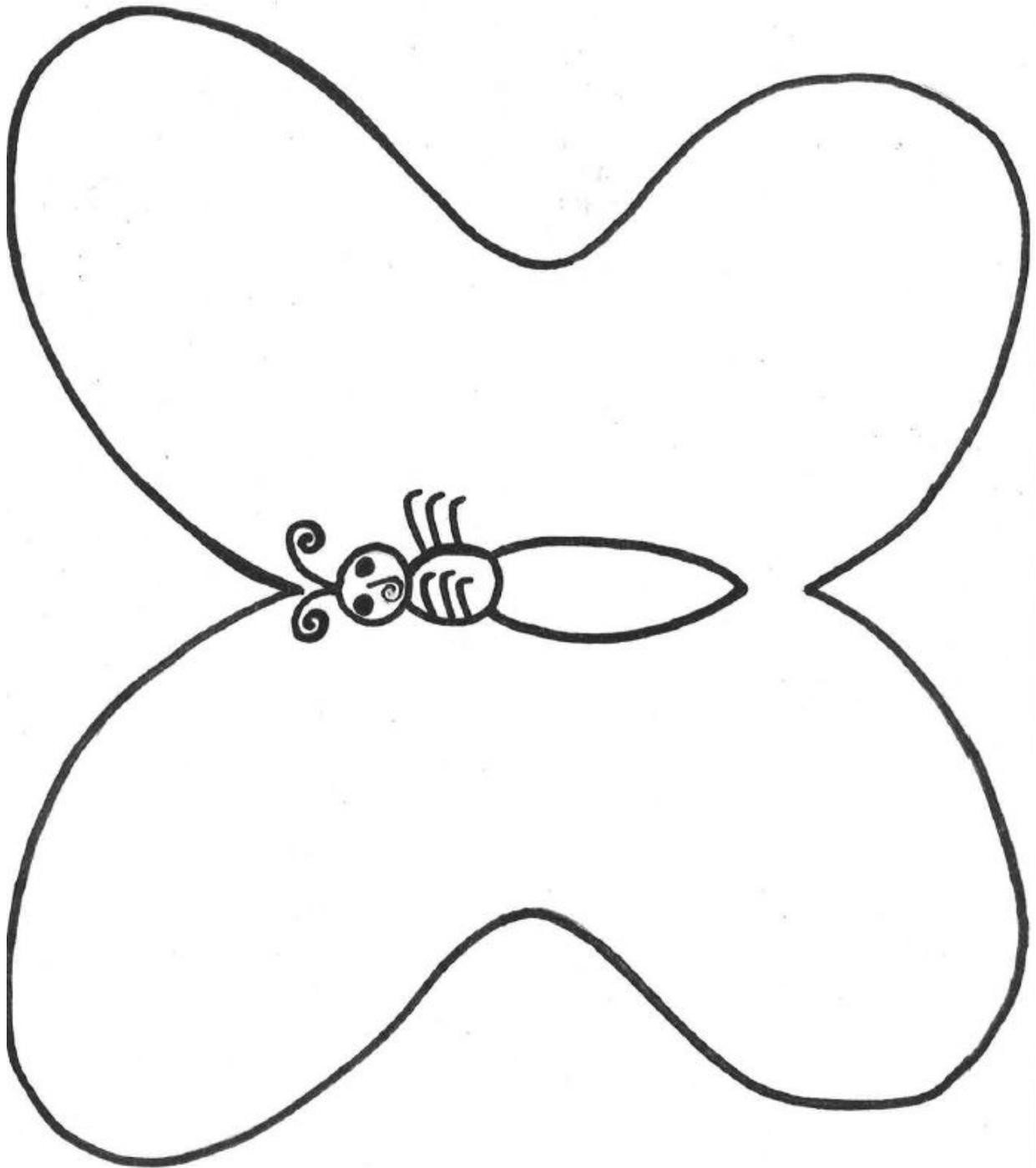
Directions

1. Print out the butterfly on page 2.
2. Color the butterfly and then cut it out.
3. Fold the butterfly in half to make a caterpillar.
4. Color the caterpillar and draw a face on one end.

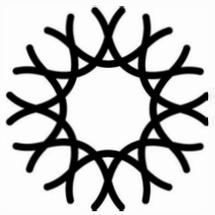
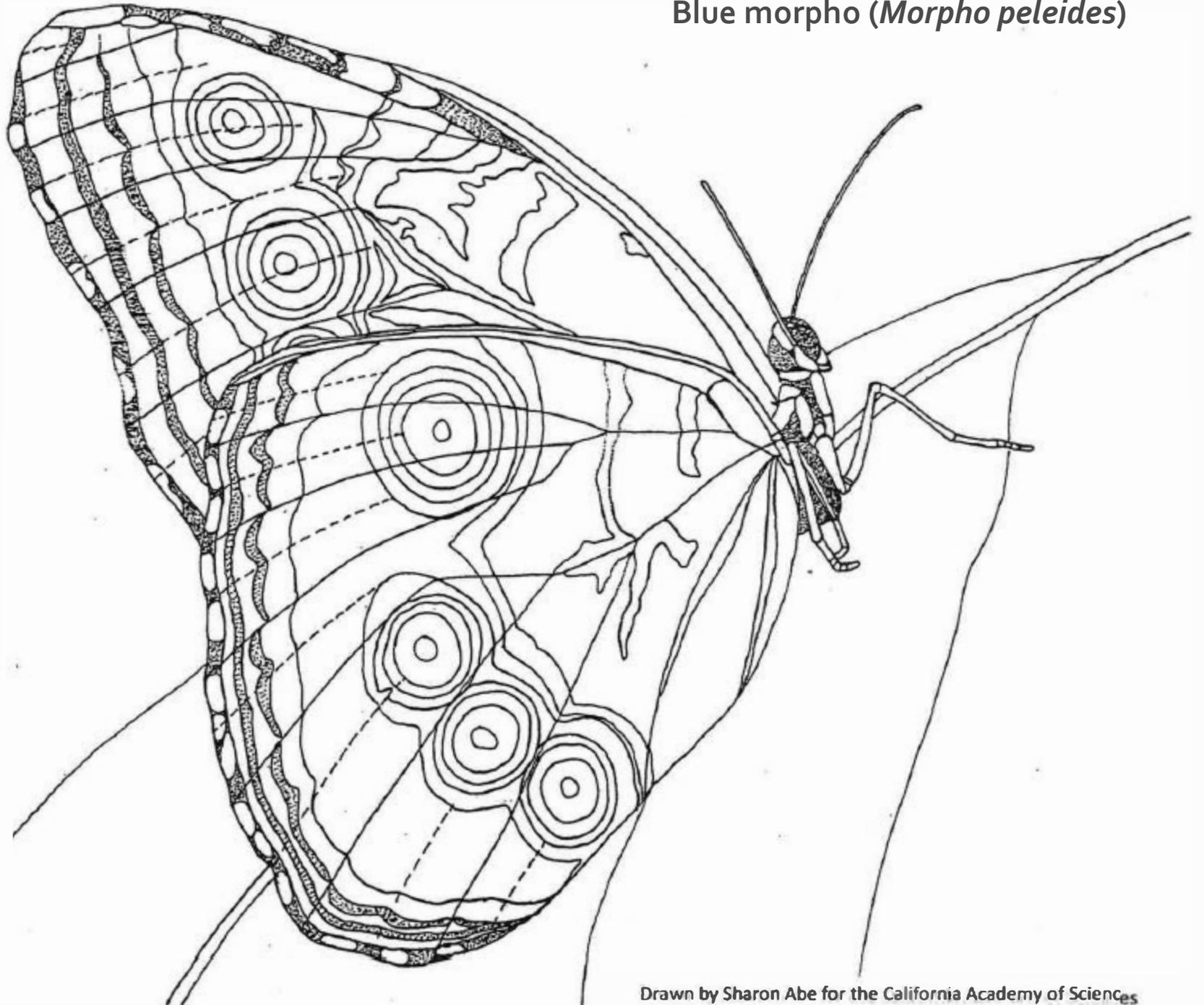




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Blue morpho (*Morpho peleides*)



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Drawn by Sharon Abe for the California Academy of Sciences



Invent an Insect

Materials

Insect Diagram: What Makes an Insect an Insect?
Insect or Not? Arthropods Picture Sheet
Invent an Insect sheet
Pen or pencil
Colored pencils/markers (optional)

Insects occur almost everywhere on our planet. Almost everywhere entomologists (scientists who study insects) have looked, they have found many different types of insect species, each suited to the environment in which they live. This includes extreme environments like mountain tops, deserts, and frozen fresh water.

Scientists classify animals according to how their bodies have evolved. Animals with similar characteristics are grouped together. Insects belong to a very large group of animals called arthropods. Spiders, crabs, centipedes, ticks, scorpions, shrimp, also belong to the arthropod group, but they are not insects. All insects share these features:

Exoskeleton: Unlike humans, who have our skeletons on the inside, insects wear their skeleton on the outside of their bodies. This type of skeleton is called an exoskeleton. It provides structure and protection for the insect's insides.

Three Body Segments: All insects have a body that is divided into three parts, or segments: the head, the thorax, and the abdomen. The eyes and the antennae are always located on the head. The legs are always connected to the thorax. All that remains on the body is the abdomen, located on the opposite end as the head!

Six Legs: All adult insects have six legs. By looking at an insect's legs, you can usually tell what type of environment it lives in. For example, many insects that live in the water, such as water boatmen, have flattened oar-like legs to help them paddle through the water. Other insects may have legs suited for running, or climbing, or jumping great distances.

Antennae: Adult insects have a pair of sensitive antennae on their heads. These organs are used to feel, smell, and sometimes hear. Antennae come in a wide range of shapes and sizes, depending upon how they are used.

Wings: Almost all insects have wings. Usually, insects have two sets of wings that move together. In beetles, the front pair of wings are hard and protect the hind wings.



Activity #1: Label an Insect

Now it's your turn to be an entomologist. On the *What Makes an Insect an Insect Diagram*, fill in the blanks to label the parts of a typical insect.

Activity #2: Insect or Not?

Now that you have practiced labelling the parts of an insect, let's see how you do at figuring out what arthropods are insects or not! On the *Insect or Not? Pictures*, decide for yourself if the animal pictured is an insect, or another type of arthropod. The answer key is on the last page of the set of pictures.

Activity #3: Invent an Insect

Now it's your turn to invent your own insect! Before you get started, you will need to learn a couple more things about insects and how they live.

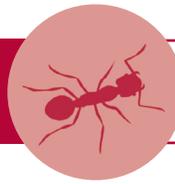
Habitat: A habitat is the place or type of place where a plant or animal naturally or normally lives and grows. Insects live in practically every habitat on Earth, ranging from windy beaches, to the tallest mountains, to living on other creatures like dogs and cats. Habitats you might consider for your insect include a dark cave, a dry desert, a fallen log, a fruit tree, a stream, or under a rock.

Adaptation: An adaptation can be any part of an animal that helps it survive. For example, a flea has biting and sucking mouthparts, and powerful back legs for jumping around the host animal, including perhaps your pet dog or cat! Get creative as you think about the kinds of food your insect will eat, the kind of life it leads, and what types of adaptations it will need to survive and thrive.

Predator and Prey: Insects can be predators, meaning they eat other animals. For example, the praying mantis is a predator that loves to eat flies, crickets and mosquitoes. However, the praying mantis is prey for predators such as bats, spiders and snakes. How will your insect fit in the ecosystem --as prey, as a predator, or both?

Your Turn!

Now that you have all the information you need, use your imagination to create your own insect. Remember to include the body parts that all insects have, but also think about the special adaptations that your insect has that make it special, and perfect for its habit. You can record your description and draw and color a picture of your insect on the *Invent an Insect Worksheet*. Have fun!



What Makes an Insect an Insect?

Use the terms below to label the parts of the insect.

All insects have:

Head

Thorax

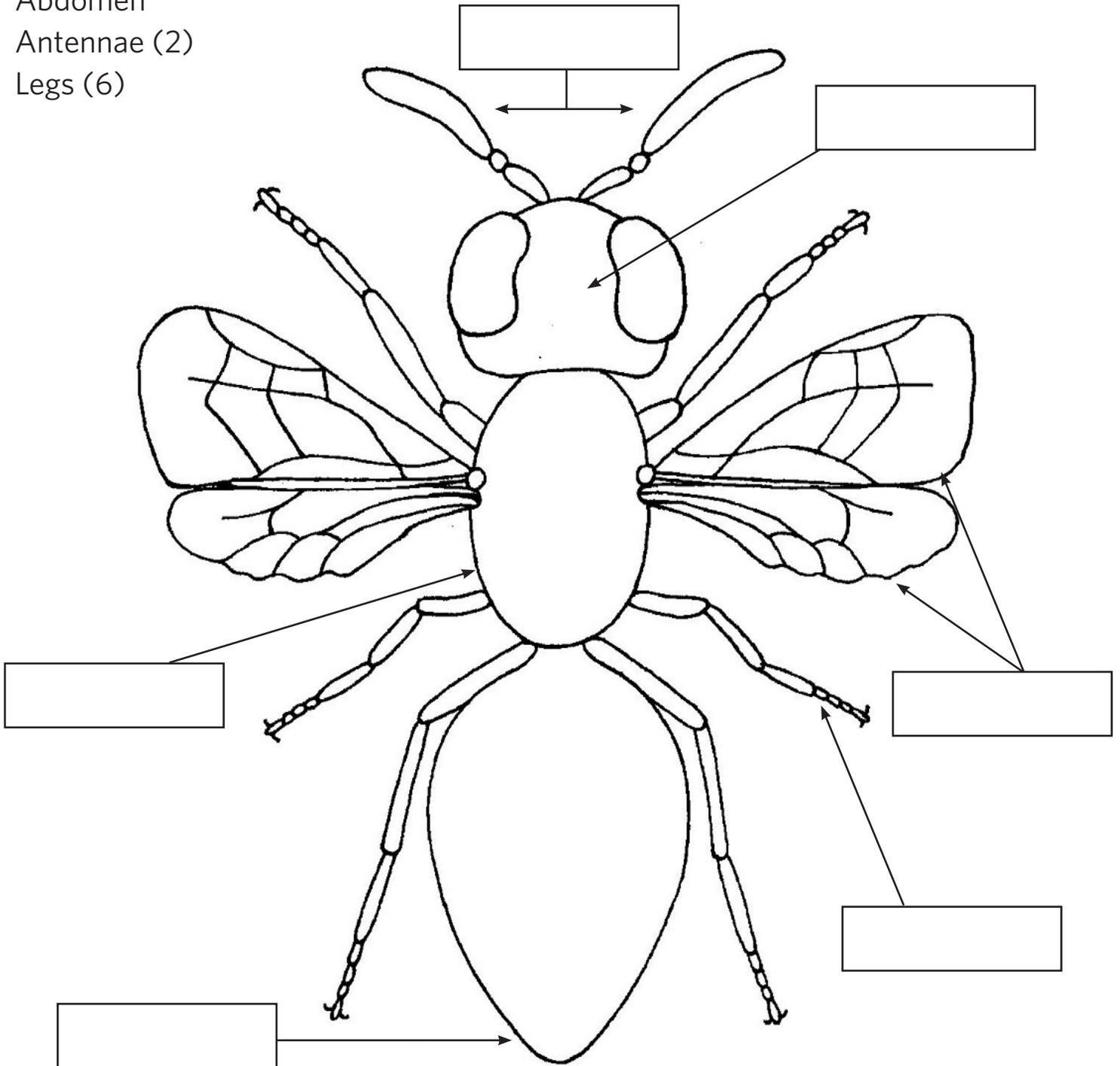
Abdomen

Antennae (2)

Legs (6)

Most insects have:

Wings



1.



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2.



3.



Photo by Isa Copyright ©

4.



©Douglas Koh

5.



6.



7.



©Terry Gray

8.



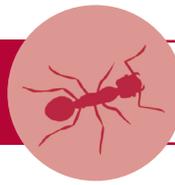
©Pascal Gaudette

9.



Answer Key:

1. Centipede - not an insect
2. Butterfly - insect
3. Scorpion - not an insect
4. Bee or wasp - insect
5. Millipede - not an insect
6. Grasshopper - insect
7. Isopod (aka: Roly Poly or Pillbug) - not an insect
8. Ladybug - insect
9. Spider - not an insect



My Name: _____ Date: _____

1) My insect's habitat: _____

2) My insect's food source: _____

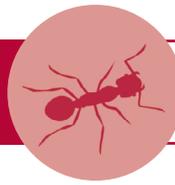
3) How it finds and eats its food: _____

4) How my insect moves: _____

5) What eats my insect: _____

6) How my insect escapes predators: _____





Draw your insect below. Be sure to label its body parts.

Name of my insect: _____

Habitat: _____

Special adaptations: _____



Iridescent Ice

Materials

Salt

Food coloring, several different colors including red
Ice cubes in a bowl

Directions

1. Place ice cubes in a bowl.
2. Add 1 pinch of salt per ice cube.
3. Add 1 drop of food coloring per ice cube. Use only 1 color per ice cube.
4. Make an observation: What do you notice about the colors on the ice? Did any of the colors develop a shiny, green iridescence?
5. Don't give up if it didn't work the first time. Try again with different amounts of salt, different wait times, or with a different brand of food coloring (try neon colors, too!)

What's happening? Background information for caregivers

Iridescence is a type of coloration. It appears shiny and changes color when you look at it from different angles. Iridescence can be seen in soap bubbles, CDs, peacock feathers, abalone shells, and some butterfly wings (like the blue morpho at right).



Iridescence is caused by light waves reflecting off multiple layers of a thin film on an object's surface. In this activity, the food coloring forms a thin film on the surface of the salt crystals. Light waves reflect off both the top and the bottom layers of the film and will combine differently depending on the distance between the layers. The specific size of the molecules in the red food coloring creates the perfect film thickness for the combination of reflected light to appear as shimmering green. This is a form of constructive interference.



Exploring Iridescence

Materials

Clear nail polish

Long, thin strips of black paper, about one-inch wide

Water in a disposable plastic or metal tray or bowl (e.g. takeout food container)

Paper towel or rag

Directions

1. Make sure you are in a well-ventilated area with adult supervision.
2. Add a shallow layer of water to a disposable plastic or metal tray or bowl.
3. Open a bottle of clear nail polish and touch the tip of the brush to the water's surface. The drop will spread over the surface of the water.
4. Hold one end of the black paper strip and dunk the opposite end into the water. Submerge about half of the paper while keeping your fingers dry.
5. Gently remove the paper strip from the water and lay flat onto a paper towel to dry.
6. Allow to dry on the paper towel and then observe the rainbow-colored layer of iridescence.

What's happening? Background information for caregivers

Iridescence is a type of coloration. It appears shiny and changes color when you look at it from different angles. Iridescence can be seen in soap bubbles, CDs, peacock feathers, abalone shells, and some butterfly wings.

Iridescence is caused by light waves reflecting off multiple layers of a thin film on an object's surface. In this activity, the nail polish forms a thin film on the surface of the paper. Based on the thickness of the nail polish, it reflects different colors of light—the rainbow colors.

