

CREATE YOUR OWN INSECT (1 Hour)

Addresses NGSS

Level of Difficulty:

2 Grade Range: 3-5

OVERVIEW

In this activity, students will learn about the body parts of insects. They will learn about the function of these parts and how they may help the insect survive in their habitat. The students will create their ultimate insect.

Topic: Insect body parts and their function

Real-World Science Topics:

- Insect body parts have developed adaptations to allow them to live and thrive in their environments.

Objective

Students will learn about the parts of an insect and their function and then will design and build their ultimate insect.

Materials Needed for Student Activity

- pipe cleaners
- paper towel rolls
- clay, yarn, cardboard, plastic bottles, tape, other found or collected objects
- insect diagrams
- vocabulary words
- chart paper or black/interactive white board
- pencils
- insect cards
- construction paper and pencils

Teacher Preparation

Some research may be necessary to familiarize yourself with insects and their body parts. The links below will give you a variety of information including pictures and diagrams, which you will need to complete the activity.

Find pictures or diagrams that show the body parts (head, thorax, abdomen, eyes, antennae, and legs). These parts are generally similar on all insects. The wings, hair, mouth parts, and stingers will vary for each of our insects:

Butterfly, bee, fly, wasp, ant, flea

Make a KWL chart entitled, Insects.

Make a copy of Teacher Page #2 on chart paper or a black/interactive whiteboard. You will need a diagram of a basic insect showing at least the following body parts: head, thorax, abdomen, antenna, and legs to insert on this sheet.

Collect and organize the materials for the build an insect activity.

Copy Teacher Page #1 for each student and have it available on chart paper or a black/interactive whiteboard.

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NGSS Three-Dimensions

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models</p> <ul style="list-style-type: none"> • Develop a model to represent a phenomenon, process, or system that helps to explain and predict a real-world situation. 	<p>Heredity and Traits</p> <ul style="list-style-type: none"> • Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. • Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits. 	<p>Structure and Function</p> <ul style="list-style-type: none"> • Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts, therefore complex natural structures/ systems can be analyzed to determine how they function.

STEPS FOR *CREATE YOUR OWN INSECT*

- 1. Warm-up Activity:** Put a KWL chart on the board and ask the students to tell you what they know about insects. When they have finished, ask them what they would like to learn about insects. After some brief discussion tell your students they will be learning about insects. They will concentrate on the wasp, bee, ant, fly, flea, and butterfly. Split the students into groups and give each group 1 insect card and Teacher Page #1. Give the students several minutes to study the cards and then place Teacher Page #2 on the front board. Go through the insect parts one at a time and have each group explain about the different body parts of their insect. Write their responses on the chart. Finish the chart by asking each group to name a feature of their insect that is unique. Write their responses on the chart. Tell the students they will now be able to design their ultimate insect.
- 2.** Split the students into smaller groups of 2-3 students. Have the materials ready for each group. Remind the students their insect must have the same body parts all insects have and in addition, they need to choose one of the following behaviors for their insect and design a specific body part to meet the needs of the behavior. The behavior choices are; hive dweller, burrower, nectar gatherer, bloodsucker, parasite, and meat eater. They may use their imagination to add additional features that will help their insect live in the environment they choose. Instruct the students:
 - Using construction paper, create an anatomy chart (design) for your insect.
 - Your design must contain all the main parts all insects have plus the body part(s) for your chosen behavior.
 - You may then add additional body parts to your ultimate insect.
 - When you have finished your design the instructor will hand you your building materials.
 - Using the building materials, build your insect from your design.
 - Be prepared to name your insect and explain your insect's adaptation.
- 3. Wrap-up Activity:** Each group will share their ultimate insect. Return to the KWL and complete the L section of the chart. At this point you should talk about any incorrect information written on the chart in the first part of the lesson. Review with the class what they have learned about insects.

Create Your Own Insect Extension Activity

For extension you may have the students explore all the behavior options when designing an insect. Make a super insect with several of the behaviors and the appropriate body part adaptations. Students may be asked to look in their yards for insects. They can draw or diagram the insects they find and research them, looking for their special behaviors and the body parts that have developed to meet their behavior needs.

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BACKGROUND INFORMATION

Insects make up the majority of non-plant life on Earth. Close to one million different species of insects have been identified (compared to only 4,000 or so mammals). Insects are found all around the world and can both help human life and hinder it. Insects have three main body parts: head, thorax, and abdomen. The head contains the antennae, compound eyes, and mouth parts. The legs (three pairs) and wings (if the insect has wings) can be found on the thorax. The digestive tract and waste systems are found primarily in the abdomen. Insects have six legs and an exoskeleton and are classified as invertebrates (without a backbone). Insects exhibit a wide variety of mouth parts adapted to their special ways of feeding.

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INSECT FACT CARDS

Wasp Facts	Legs	Wings	Sting	Mouthparts	Hunter/Gatherer or Parasite
<p>Smooth body</p> <p>Lives in Colony</p> <p>Queen Builds new colony each year.</p> <p>Build Paper Nests</p> <p>Queen eats wood pulp to make paper</p> <p>Wasps have compound eyes.</p>	<p>Yes - 6</p> <p>Wasps have 3 sets of 2 legs.</p>	<p>Yes 2 sets.</p>	<p>Yes</p> <p>Wasps can sting many times without dying.</p>		<p>Hunter</p> <p>Wasps hunt spiders and other insects to feed their larva</p>

Bee Facts	Legs	Wings	Sting	Mouthparts	Hunter/Gatherer or Parasite
<p>Hairy body to collect pollen.</p> <p>Bees spread pollen from flowering plants to fertilize them.</p> <p>Bees are colony insects.</p> <p>Bees have a queen which lays eggs to keep the colony alive.</p> <p>Bees build wax/honey-comb nests.</p> <p>Worker bees are all female.</p> <p>Bees have compound eyes.</p>	<p>Yes - 6</p> <p>Bees have 3 sets of 2 legs.</p> <p>Bees are covered with hair to collect pollen to spread to other flowers.</p>	<p>Yes 2 sets.</p>	<p>Yes</p> <p>Most bees can sting only once before dying.</p>		<p>Hunter</p> <p>Gathers nectar from flowering plants.</p>

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INSECT FACT CARDS

Flea Facts	Legs	Wings	Sting	Mouthparts	Hunter/Gatherer or Parasite
<p>Adult fleas are between 1-3 mm long and brownish in color.</p> <p>Fleas have hairy bodies designed to cling to their hosts.</p> <p>Some fleas have been known to jump up to 6 feet.</p> <p>Fleas have compound eyes.</p>	<p>Yes - 6</p> <p>Fleas have 3 sets of 2 legs.</p> <p>The hind set of legs on fleas is designed for jumping. They jump from host to host to feed and reproduce.</p>	No	No	Mouthparts adapted for piercing skin and sucking the blood of their host.	<p>Parasite</p> <p>Fleas drink the blood of their host.</p>

Butterfly Facts	Legs	Wings	Sting	Mouthparts	Hunter/Gatherer or Parasite
<p>Butterflies vary in size and come in many different color patterns.</p> <p>Antennae are used for the sense of smell and for balance.</p> <p>Butterflies have compound eyes.</p>	<p>Yes - 6</p> <p>Butterflies have 3 sets of 2 legs.</p> <p>Their taste sensors are located in the feet, and by standing on their food, they can taste it!</p>	<p>Yes</p> <p>All butterflies have four wings: a forewing and a hindwing on each side of its body.</p>	No	<p>Proboscis - Long straw-like tube used to drink nectar from flowering plants and trees.</p>	<p>Gathers nectar from flowering plants using proboscis.</p>

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INSECT FACT CARDS

Ant Facts	Legs	Wings	Sting	Mouthparts	Hunter/Gatherer or Parasite
<p>Ants have smooth bodies.</p> <p>Ants build nests (colonies) underground, in dead trees, or anywhere that seems safe. Queen ants lay eggs to keep the colony alive.</p> <p>All workers are female.</p> <p>Ants have compound eyes.</p>	<p>Yes - 6</p> <p>Ants have 3 sets of 2 legs.</p>	<p>Only Queens and males have wings.</p> <p>After mating the males ants die and the queens fly away to begin a new colony.</p> <p>When reaching a new site to nest, queens break off wings and never fly again.</p>	<p>No</p>	<p>Ants have mandibles and use their mandibles in many ways.</p> <p>In some respects they use them as their hands to build, fight, cut, and hold.</p>	<p>Hunter/-Gatherer</p> <p>Ants will find and eat dead prey and some will also hunt and kill their prey. Others eat plants.</p>

Fly Facts	Legs	Wings	Sting	Mouthparts	Hunter/Gatherer or Parasite
<p>Flies spread disease.</p> <p>Flies lay their eggs on, or in, rotting flesh or feces.</p> <p>Flies have compound eyes.</p>	<p>Yes - 6</p> <p>Flies have 3 sets of 2 legs.</p>	<p>Yes- 2 sets, 1 set of fully developed wings, the second set (hind set) is small and used to maintain balance in flight.</p>	<p>No</p>	<p>Adult mouth parts are sponging, lapping, or piercing designs.</p>	<p>Gatherer</p> <p>Adult flies feed on sugary food of any kind, including nectar and rotting fruit.</p>

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TEACHER HANDOUT

Insects

All insects are invertebrates (they have no backbone).

All insects have 3 main body parts (head, thorax, and abdomen).

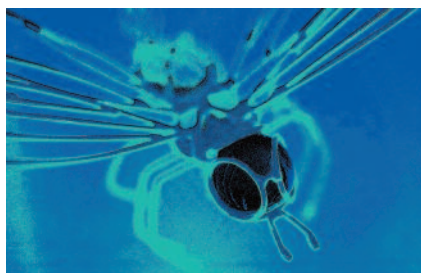
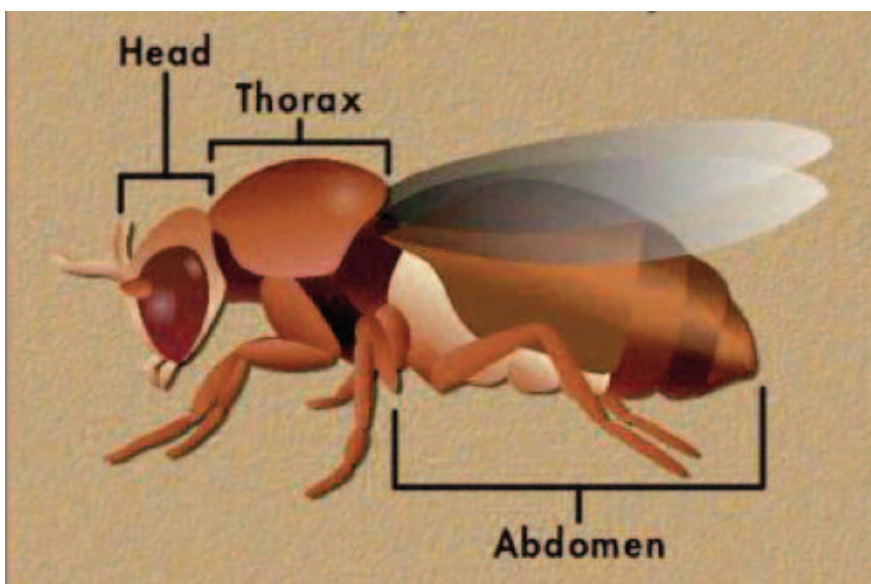
All insects have 6 legs (3 sets of 2 legs)

All insects have compound eyes (many faceted eyes that allow the insect to see almost everywhere at once).

All insects have adapted to their environment through the development of unique features, stingers, wings, mouth parts, etc.

Key Vocabulary:

Invertebrates
Head
Thorax
Abdomen
Compound Eyes
Antennae
Legs
Wings



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TEACHER HANDOUT

Insects

	Wasp	Bee	Flea	Ant	Butterfly	Fly
Mouth Parts						
Stinger						
Wings						
Unique Feature						