

# Examination of the Body of a Grasshopper

**Grade Level: 4-8**

## Lesson Overview

Students will explore the parts of a grasshopper as they learn about what the characteristics are of an insect.

## Student Objectives

1. Identify basic characteristics of the body of a typical insect.
2. Discuss what they have observed and learned about this insect as it relates to Illinois' agriculture.

## Materials

- ✓ preserved grasshoppers (1 per student or group of 2-4 students)  
Note: An Insect mAGic kit containing all these materials may be available from your IL Agricultural Literacy Coordinator  
([http://www.agintheclassroom.org/AGLitCoord/Coordinator%20Directory\\_website.pdf](http://www.agintheclassroom.org/AGLitCoord/Coordinator%20Directory_website.pdf)).  
[Cricketts may be used as an alternative as they have a similar anatomy. Cricketts may be purchased from pet stores and then frozen to kill them.]
- ✓ 32 oz specimen jar
- ✓ strainer
- ✓ small paper plates
- ✓ tweezer
- ✓ magnifying lenses (1 per student)
- ✓ Examination of the Body of a Grasshopper Worksheet

## Vocabulary

- **abdomen** - the most posterior of the insect's three body divisions; the insect's respiration, digestion and reproduction systems are located here.
- **antennae** - moveable structures found in pairs on the head of insects used to detect smells, vibrations, or sounds.
- **compound eye** - an eye composed of many individual light-receptive parts, each with a lens.
- **head** - the uppermost or forward most body region of an insect containing the eyes, antennae and mouth.
- **simple eye/ocellus/ocelli (pl)** - a type of invertebrate eye that is used to detect light.

- **spiracle** - any of several tracheal openings in the exoskeleton of an insect or a spider.
- **thorax** - the middle body division of an insect, which bears the legs and wings.

## Background Information

The grasshopper is considered a pest because it chews on the plant leaves. They feed from the outer edges of the leaves inward. All types of field crops, vegetable crops, fruit crops, flowers and shrubs are subject to attack.

When numerous grasshoppers are on the corn, they even eat part of the stalk and ears. They attack fresh silks, reducing pollination and often causing the ears to be blank or only partly filled. A dense swarm will destroy a young cornfield in just three or four days.

Even light infestations of 6 or 7 grasshoppers per square yard in a 10-acre hay field will eat as much hay as a cow; 17 grasshoppers per square yard in a 40-acre hay field will eat a ton of hay a day.

Grasshoppers have caused more problems in the western states than in the Midwest. For a map showing those areas, please visit [https://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/grasshopper/downloads/hazard.pdf](https://www.aphis.usda.gov/plant_health/plant_pest_info/grasshopper/downloads/hazard.pdf).

## Procedure

Teacher completes (may be done in advance):

1. Place the strainer over the specimen jar. Then pour the preserved grasshoppers into the strainer.
2. Pour the preservative back into the original container.
3. Rinse the grasshoppers with water to remove the preservative.
4. Place one grasshopper on a small paper plate for each student. (Note: This activity can be done individually or working in small groups of 2-4 students.)

Students & Teacher complete:

1. Instruct students that these grasshoppers are being used for identification only. Students should not touch the grasshoppers or dismantle them. (Note: Anyone coming in contact with the preserved grasshoppers should wash their skin with soap and water.)

2. Students should locate and identify the following parts of the grasshopper and then label the diagrams on Examination of the Body of a Grasshopper Worksheet.
  - a. head
  - b. compound & simple eyes
  - c. mouth
  - d. antennae
  - e. thorax
  - f. abdomen
  - g. 2 pair of wings – inner wing & outer wing
  - h. 6 legs – pair of fore legs, middle legs, and hind legs
  - i. spiracles
  
3. Once students have completed their examination, return the grasshoppers to the container of preservative.
  
4. Discussion questions:
  - a. What are the key characteristics of an insect?  
**3 body parts (head, thorax, abdomen) and 3 pair of legs**
  
  - b. What body parts are found in an insect which are also found in other animals and human beings?  
**head, legs, thorax & abdomen may be combined in one body region, wings in some others but not the same structure, eyes, skeleton internal rather than external, organ for hearing**
  
  - c. Compare how the grasshopper takes in air (oxygen) to how a human takes in air.  
**Humans take in air through their nose located on their head. Grasshoppers take in air through their spiracles located on the abdomen.**
  
  - d. Which of the body parts are essential? Are there any which the students think are not essential?  
**For example, there are many insects that do not have wings.**
  
  - e. Only the male grasshopper makes sound. Why?  
**Possible answers might be that only the male needs to make sound. Females are safer if they do not make sound.**
  
  - f. What is the difference between compound and simple eyes? Why does the grasshopper need so many eyes?

**Compound eyes see distance plus objects. Simple eyes really see only light. The combination is highly effective for grasshoppers.**

Note: To illustrate what an insect sees, grab a handful of straws and look through them. Humans see the complete picture all at once. Insects see their world divided into several thousand parts.

- g. What conclusions could be drawn about the way the grasshopper moves by looking at the three pair of legs?  
**It can crawl, climb and jump. The unique back legs enable them to jump.**
- h. What kind of crop damage would the grasshopper do with its mouth parts?  
**For a closer view of the grasshopper's head and mouth parts, please refer to Close Up Examination of the Head & Mouth of a Grasshopper diagrams.**

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## **Extension Activities**

1. Compare the parts of a grasshopper to the parts of a honeybee located at the end of this lesson.

## **Additional Resources**

- <https://web.extension.illinois.edu/insects/> - Let's Talk About Insects.

- <http://www.uwyo.edu/entomology/grasshoppers/colorado/identification.html>  
<http://www.uwyo.edu/entomology/grasshoppers/field-guide/ghparts.html>  
These websites provide a more in depth look at the parts of a grasshopper.
- <https://extension.colostate.edu/topic-areas/insects/grasshopper-control-in-gardens-small-acreages-5-536/> Learn more about grasshopper control in Colorado where there are larger infestations.

## Standards

### ***Illinois Science Standard***

MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

### ***Illinois English Language Arts Standard***

RST 1: Cite specific textual evidence to support analysis of science and technical texts.

The **M**ultidisciplinary **A**gricultural **I**ntegrated **C**urriculum (mAGic) was created in 2004 under the leadership of the Illinois State Board of Education (ISBE) and the Facilitating Coordination in Agricultural Education Project (FCAE). Funding was made available through the FCAE grant budget from the agricultural education line item of the ISBE budget. This revision, as printed, was developed in April 2021.



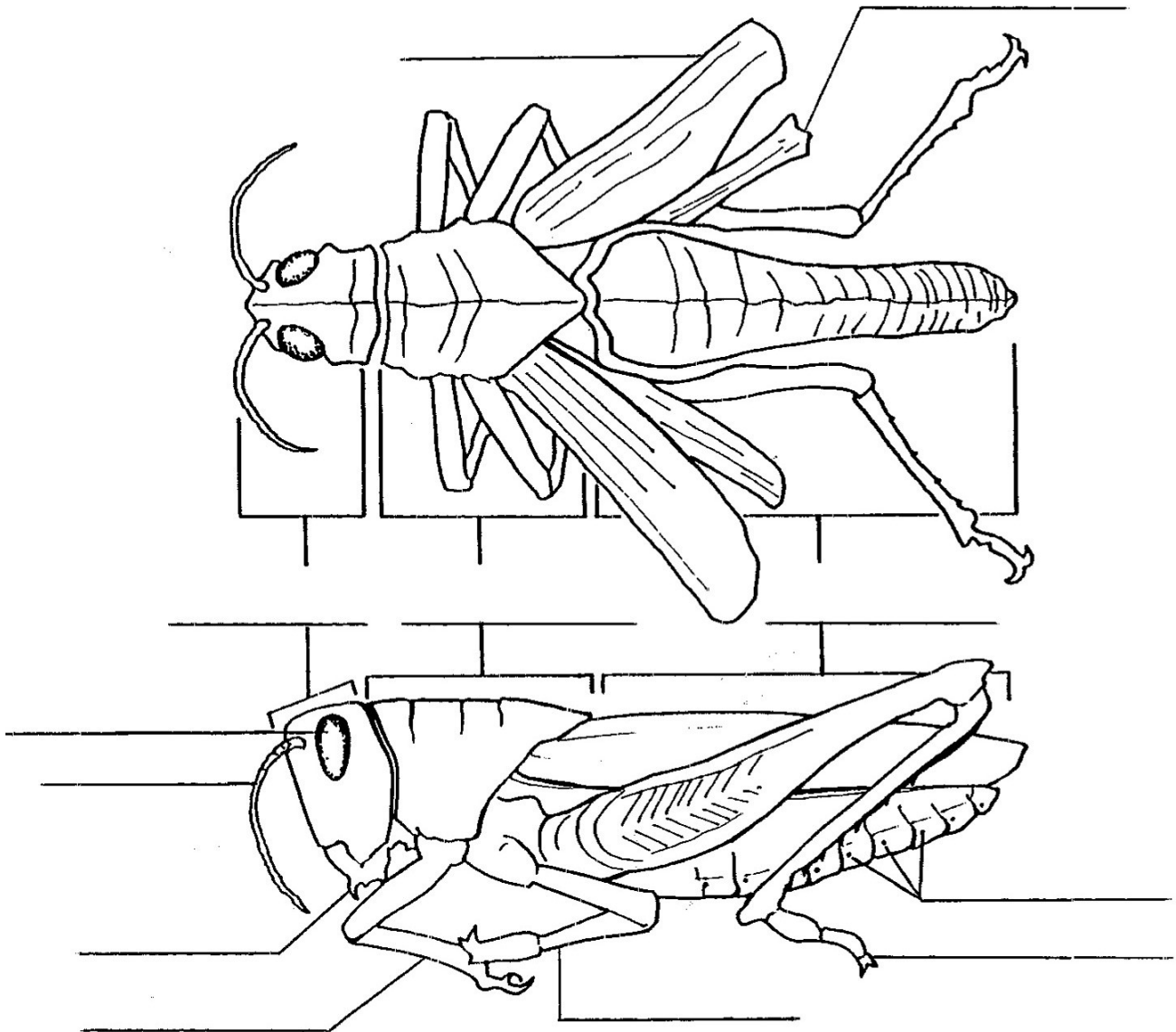
These mAGic lessons are designed to bring agriculture to life in your classroom. They address the Illinois Learning Standards in math, science, English language arts and social studies.

Insect mAGic project update writers/reviewers: Rhodora Collins – Dekalb County; Suzi Myers – Kane County; Connie Niemann – Montgomery County; Debbie Ruff – Livingston County; Jennifer Waters – Sangamon County; and Dawn Weinberg – Hancock County.

Name \_\_\_\_\_

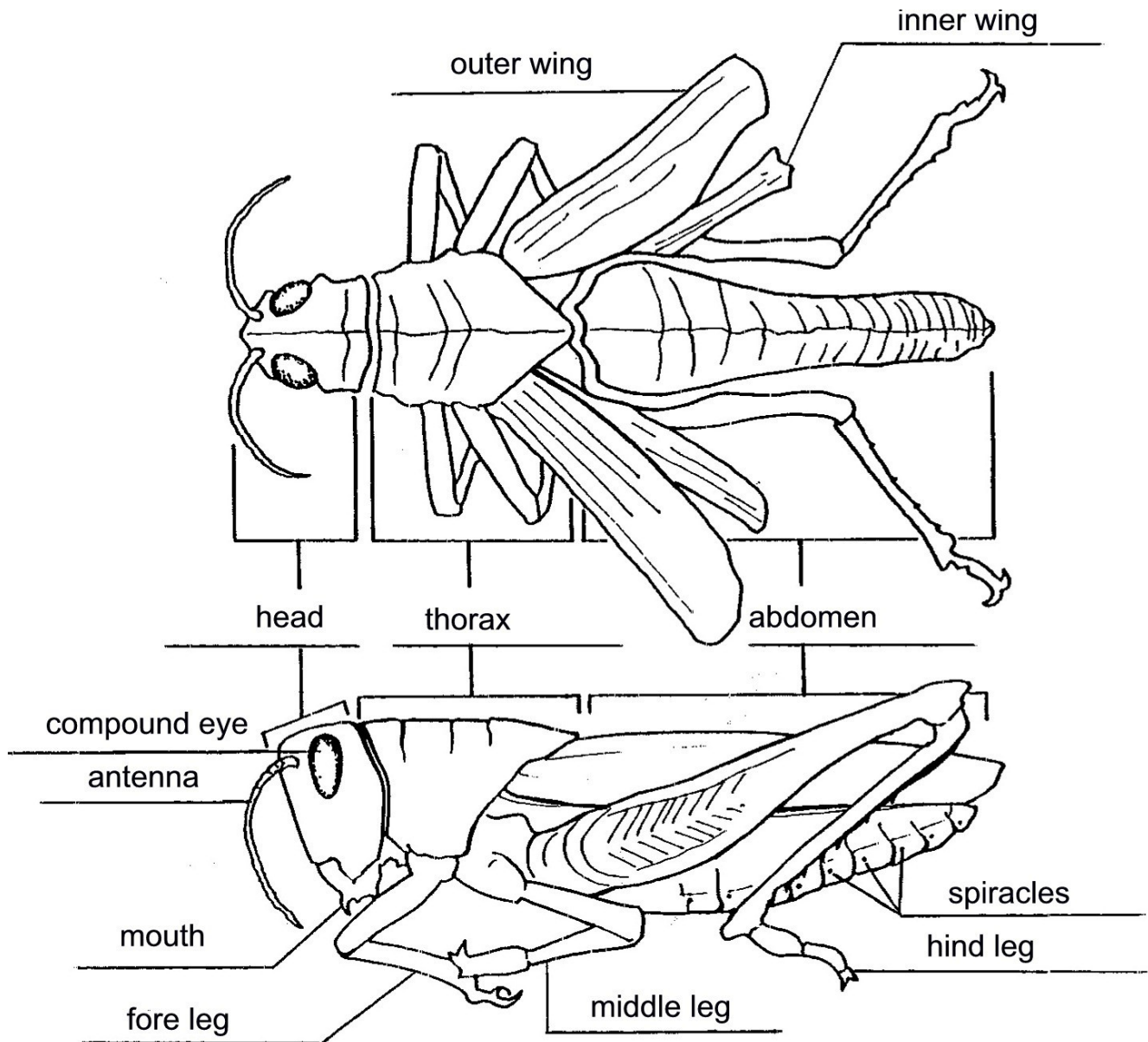
### Examination of the Body of a Grasshopper Worksheet

Label the following parts: head, compound eye, mouth, antenna, thorax, abdomen, inner wing, outer wing, fore leg, middle leg, hind leg, spiracles.

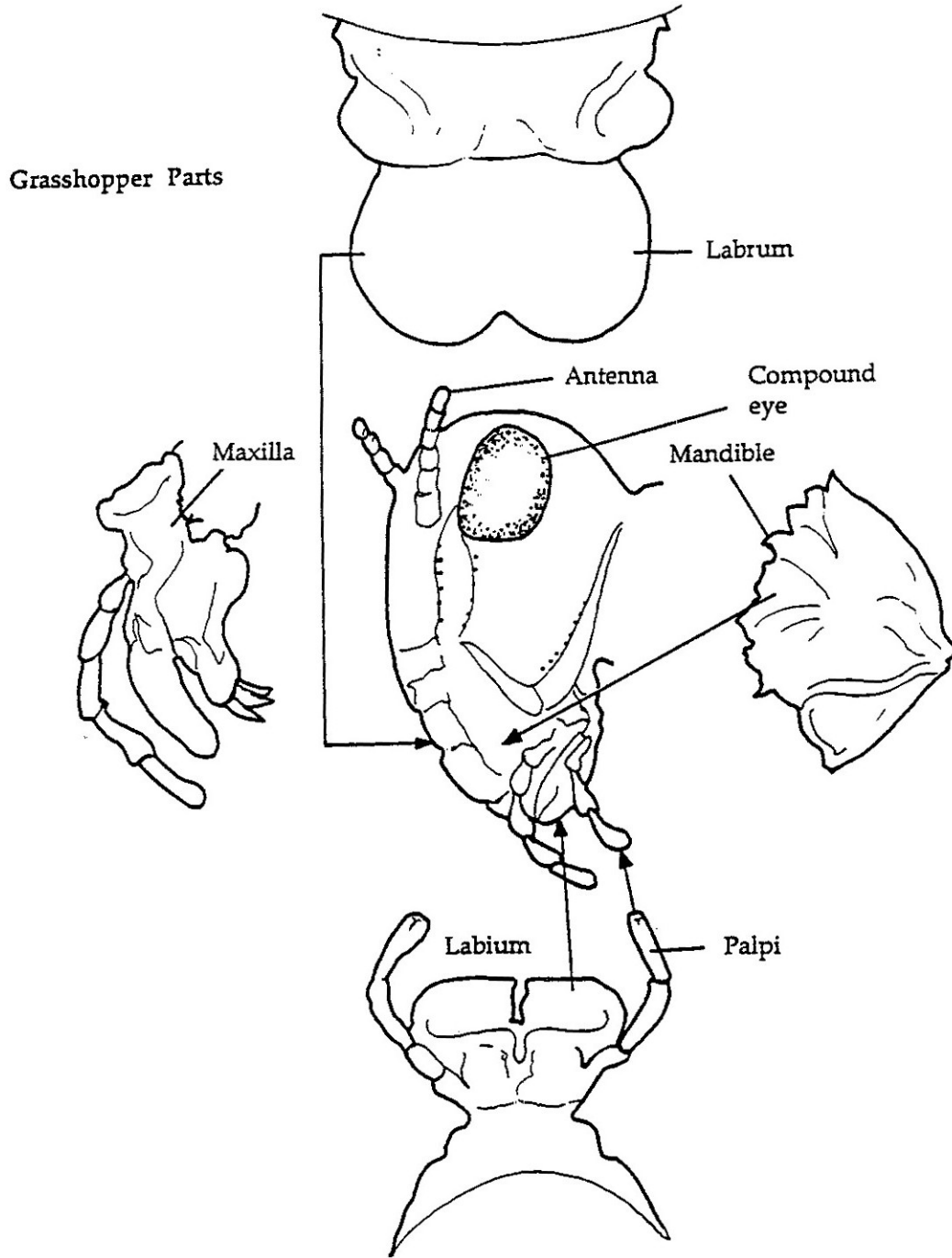


## Examination of the Body of a Grasshopper ANSWER KEY

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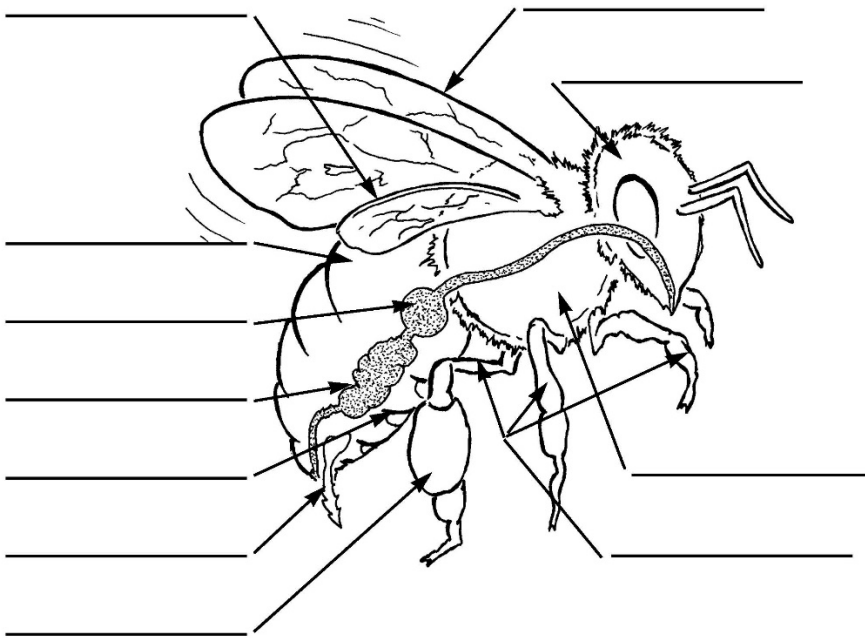
# Close Up Examination of the Head & Mouth of a Grasshopper





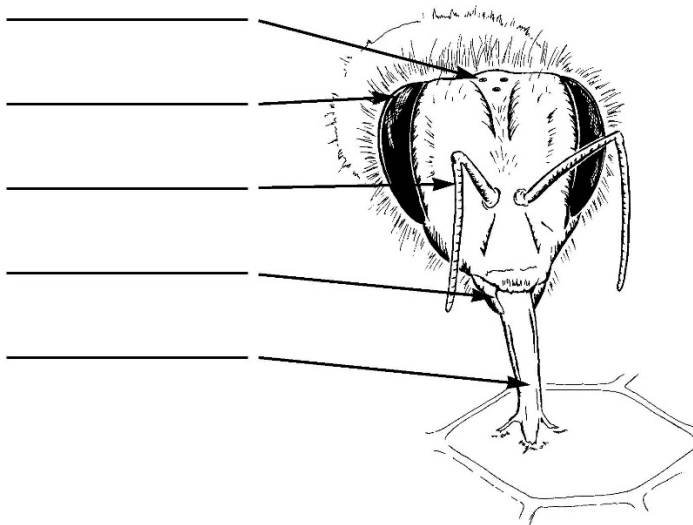
# Honey Bees - Biology

## Worksheet #1: The Honey Bee Body



### Label the following:

- Abdomen
- Fore wing
- Head
- Hind wing
- Honey sac
- Legs
- Midgut or ventriculus
- Pollen basket
- Stinger
- Thorax
- Wax gland



### Label the following:

- Antenna
- Compound eye
- Mandible
- Ocellus
- Proboscis or tongue

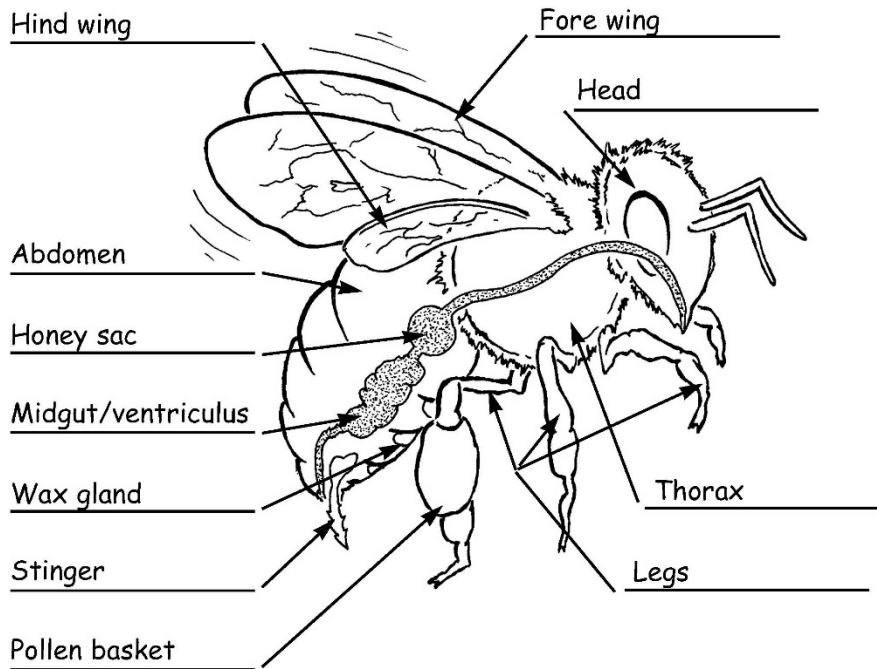
This worksheet from the Honey Files teacher's guide is used with permission from the National Honey Board <https://honey.com/>.

# Answer Key

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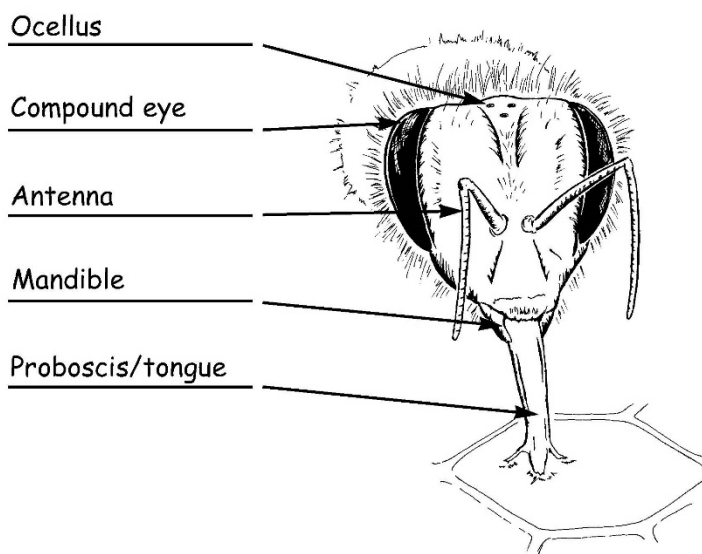
## Answer Keys

### Worksheet #1



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