

## An Investigation into Bee Anatomy

Your name \_\_\_\_\_

Group member names \_\_\_\_\_

1) Today we're going to concentrate on the anatomy of the worker bee, of which you have a specimen. Label the castes of bees below.



II) Now in the box below, sketch a picture of your bee, as detailed as you can, from the side.

Label the three basic body segments, the **head**, the **thorax** and the **abdomen**. To where do the legs attach? To where do the wings attach? How many sets of legs and wings does the bee have?

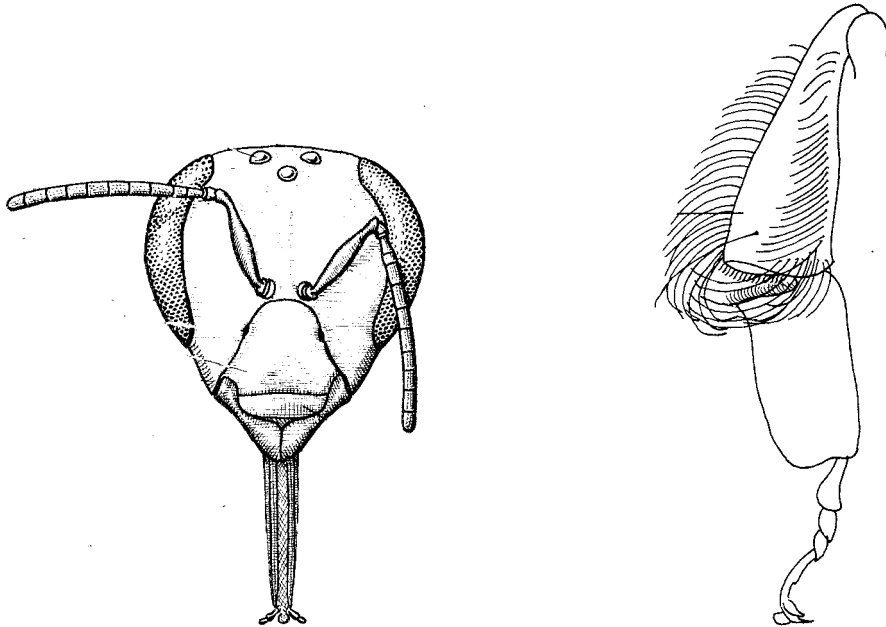
Label a **tergite** (hardened plates). How many tergites are on the bee's thorax? On the abdomen?

Sketch of your specimen



III) Using these pictures, locate the following body structures:

- a) antennae
- b) proboscis (used for lapping nectar)
- c) compound eye
- d) ocelli
- e) mandible (used for chewing)
- f) corbicula (pollen basket)

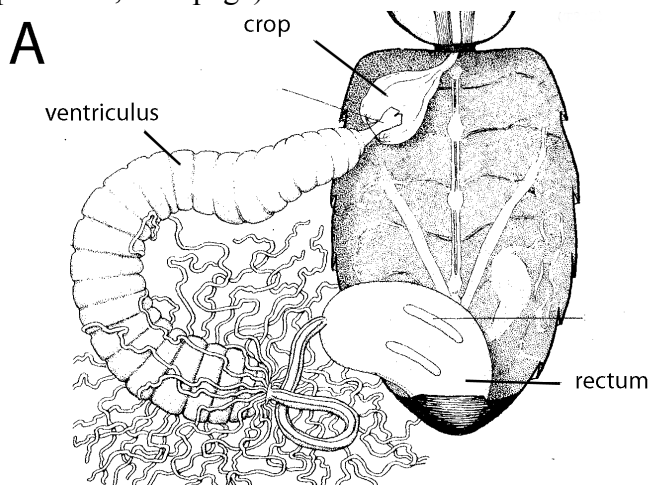


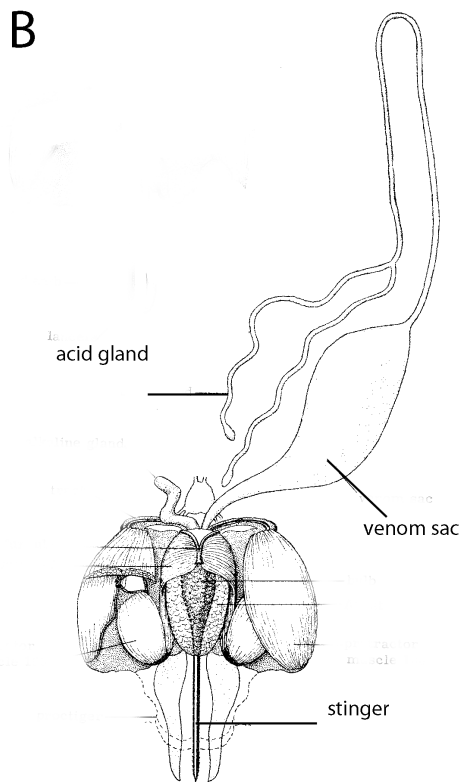
***Challenge! It's time to test your knowledge! Once you have reached this point in the activity, make sure that every group member can identify all the previously listed body parts ON THE SPECIMEN ITSELF UNDER THE MICROSCOPE. Tell your instructor when you are ready and they will ask a random member of the group to identify two different body parts under the microscope. When your group has completed the challenge, your instructor will initial here \_\_\_\_\_***

**III) While you are waiting, answer the following questions:**

- 1) What sensory organs are found on the **anterior** (forward) part of the body? What sensory organs are found on the **posterior** (back) part of the body? What are found on the **dorsal** (upper) side? What on the **ventral** (bottom)?
  
- 2) Large flight muscles are necessary to drive a bee's wings. Where on the bee's body are the flight muscles probably located? If the muscles are large, what else is there room for in that body region?

IV) Now you're going to look on the inside of the abdomen of your bee. Cut off the abdomen with the scissors. Now with the pins, slowly take off each tergite. You should come to see something like the picture A. Identify the crop, the ventriculus, and the rectum. Attached to the sting, you should be able to see the venom sac, looking like a transparent balloon, with the acid gland looking like a thin thread coming off the balloon (picture B, next page).





Now for your experiment, you are going to take some fluid from your bee, to test the response of bees towards.

You can take fluid from the ventriculus, the crop or the rectum. To get the fluid out, you can dissect the organ, put it onto a glass slide and then cut it into little pieces with a pin. The fluid can then be pipetted up and put into a small glass jar. The control fluid that you will compare to these fluids is water.

Alternatively, you can dissect out the venom sac. Pipette it into a glass jar. Then add hexane (this will break down the sac membrane), and store. What should the control fluid be when testing the venom sac?

Sting gland extract is known to be repulsive to bees foraging in the field. What do you hypothesize about the extract of the rectum or ventriculus? What about the extract of the crop (the crop is where bees store nectar on the way back to the hive)?