

# Activity 6: This One or That One



*There are an estimated 6 to 10 million species of insects, more than any other group of animals on the earth. Insects represent over half of all known living organisms, are among the most diverse group of animals on the planet, and are found in nearly every environment. Consequently, identifying an individual specimen takes knowledge, practice, and perseverance.*

A dichotomous (two-choice) key can help you identify a particular insect by using small differences in color, size, or shape. Dichotomous keys help guide you to proper identification by choosing between two characteristics at a time. For example, if you chose a playing card from a deck of cards, someone could identify the card by asking a series of questions that have two answers. The series of questions below shows how someone could determine which card you hold. Example answers are in parentheses.

- Is the card red or black? (red)
- Is it "hearts" or "diamonds?" (hearts)
- Is it a face card? (no)
- Is it above 5? (yes)
- Is it above 8? (no)
- Is the card above 6? (yes)
- Do you have the 8 of hearts? (no)
- Your card is the 7 of hearts.

The same technique is used to identify insects. Each step through the key takes you to a smaller and smaller group of insects. This continues until no further choices are available and you get to the final name, hopefully the correct name of the unknown insect!

Insect wings and legs are often used in dichotomous keys. The essential make-up of all functional insect wings is the same: a thin membrane, supported by veins both around and within the margin. However, there are significant differences between the wings of the largest orders of insects. Insect legs generally reflect a specific behavior of the insect, whether it is for jumping, digging, swimming, hopping, grasping, or running. These can also be used to differentiate insects.

## Dichotomous Key Tool Kit

- Index cards
- Poster board or large sheet of paper
- Collect the insects listed below, take them from your collection, or find good color pictures of each. Assign each with the new (first) name. This will be your answer key.
  - Wally = Worker ant
  - Betty = Butterfly
  - Douglas = Dragonfly
  - Ernest = Earwig
  - Geraldine = Grasshopper
  - Lucy = Lady beetle
  - Priscilla = Praying mantid
  - Horace = House fly
- Construct a dichotomous key using the following wing or leg facts that will allow someone to identify the first name of each of your insects. You can try this on your own, or ask your facilitator for help.
  - Wally does not have wings.
  - Horace has only two wings (one pair). The remaining insects have four wings (two pairs).
  - Betty and Douglas both have two pairs of visible wings.
  - Betty's wings are covered with tiny scales (almost like powder) that give them their color.
  - Doug's wings are membranous (have clear veins).
  - Lucy has very hardened forewings that cover her back like a shell.
  - Priscilla, Ernest, and Geraldine all have leathery forewings.

Ernest has shortened wings that look like a parachute pack.

Geraldine has enlarged back legs for jumping.

Priscilla has front legs with spines designed for grasping.

- Place your dichotomous key on the large poster board.
- Post your key on poster board or a large piece of paper, so that it is visible all at once. Leave room for the insects or pictures to be placed on the board by the contestants.
- Ask three people (contestants) to use your key to find the mystery name of the insects.
- Reveal the correct answers only after the contestants have made their selections.

## Dig Deeper

- Diagram a dichotomous key for the red cards in a deck of playing cards.
- Diagram a dichotomous key for all the cards in a deck of playing cards.
- Compare the insect key you made to a published dichotomous key. How does your key differ from the published key? Use your journal (Level 2, page 40) to record your data, record it in the graph paper section below, or download a data page from the 4-H website at [www.4-H.org/curriculum/entomology](http://www.4-H.org/curriculum/entomology).

## Life Skills

**ENTOMOLOGY SKILL:** Ability to make and use a taxonomic key.

**SCIENCE STANDARD:** Living things have both similar and different characteristics.

**SUCCESS INDICATOR:** Creation of a key that others can use to identify specific insects.



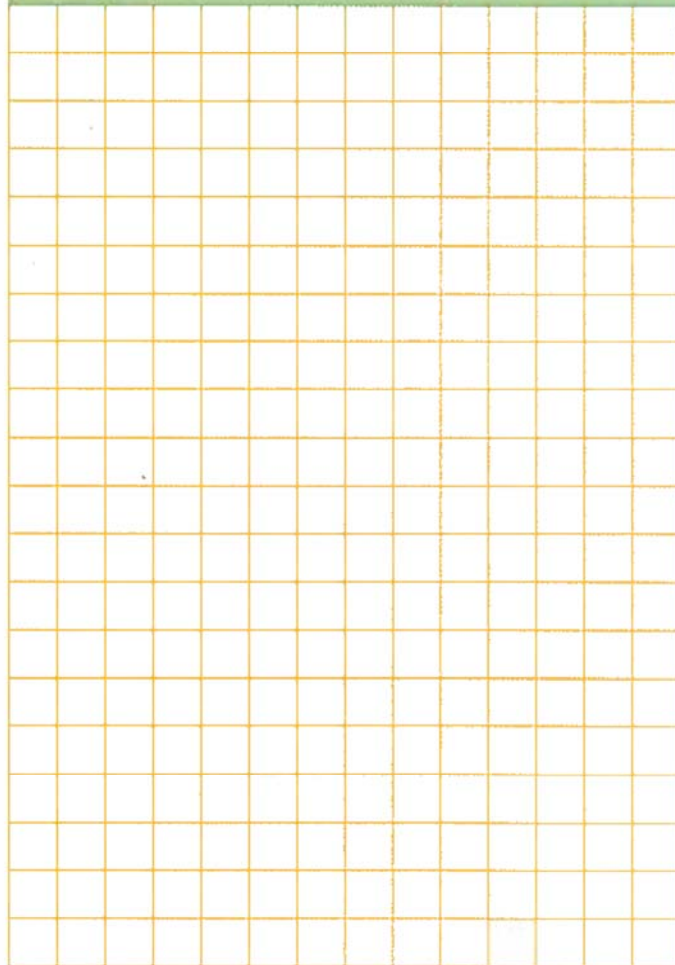
## Talk It Over

### SHARE WHAT HAPPENED:

- Was it easy to make your key?
- Were others able to identify the insects using your key?
- Can you arrive at the same answer if you ask the questions in a different order? How might your key change?

**APPLY:** Make a dichotomous key for 10 insects from the same order.

**GENERALIZE TO YOUR LIFE:** Make a dichotomous key that could help someone choose a college or discipline to study in college.



Brine flies can survive in water temperatures of 140 degrees Fahrenheit.