

## Measurement: Caliper Activity

### ***Scientific Background***

One way to learn about organisms with wings is to measure the lengths of their wings. Wing length can give clues about an organism as well as provide information about the general population of that type of creature. *Calipers* are a tool used to measure the distance between two points. This instrument can be used to measure wing length.

By measuring the fore wing lengths of a group of Monarch butterflies, we can find out if there is a difference in fore wing length between males and females. We could compare the fore wing lengths of Monarch butterflies living in one location to a different group living in another location. By collecting and comparing data about the fore wing length of each butterfly in a group, students can make hypotheses about all the organisms in the group. These hypotheses can be tested through further investigation and data collection.

The caliper activity can be found by navigating to the Monarch Butterfly screen, then clicking the caliper icon at the bottom of the screen.

### ***Vocabulary***

- caliper
- fore wing
- female
- male

*Vocabulary definitions can be found in the **Backyard Bugs** Glossary.*

### ***Thinking Question***

Why would there be a difference in fore wing lengths between Monarch butterflies that live in the same location?

### ***Exploratory and Extension Activities***

**Additional Exploratory and Extension activities are available in the *Backyard Bugs* Teacher's Guide.**

### **Writing About a Bug**

Using the information students obtained from their *Backyard Bugs* research, have each student write a short paragraph that includes a topic sentence (unifying idea) and supporting details.

Write descriptions in the form of sentences of the life cycle of a bug. These should not be in sequence. Have students cut out the sentences, put them in sequence, and paste them in correct sequence on another piece of paper.

Name: \_\_\_\_\_

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Find the fore wing length of each Monarch butterfly. Record the data in the table.						
	Female 1 (F <sub>1</sub> )	Female 2 (F <sub>2</sub> )	Female 3 (F <sub>3</sub> )	Male 1 (M <sub>1</sub> )	Male 2 (M <sub>2</sub> )	Male 3 (M <sub>3</sub> )
Fore Wing Length (in Milli-meters)	mm	mm	mm	mm	mm	mm

**What is the average fore wing length of the Monarch butterflies?  
Explain how you found the answer.**

**Based on their fore wing lengths,  
what can you conclude about these six Monarch butterflies?**

Name: \_\_\_\_\_

## Answer Key

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Find the fore wing length of each Monarch butterfly. Record the data in the table.						
	Female 1 (F <sub>1</sub> )	Female 2 (F <sub>2</sub> )	Female 3 (F <sub>3</sub> )	Male 1 (M <sub>1</sub> )	Male 2 (M <sub>2</sub> )	Male 3 (M <sub>3</sub> )
Fore Wing Length (in Milli- meters)	47.97 mm	49.72 mm	49.54 mm	50.87 mm	47.89 mm	47.11 mm

**What is the average fore wing length of the Monarch butterflies?  
Explain how you found the answer.**

*To find the average fore wing length of the Monarch butterflies, add the fore wing lengths of each of the six butterflies. Then divide by 6.*

$$47.97 + 49.72 + 49.54 + 50.87 + 47.89 + 47.11 = 293.1$$

$$293.1 \div 6 = 48.85$$

*The average fore wing length of the six Monarch butterflies is 48.85 millimeters.*

**Based on their fore wing lengths,  
what can you conclude about these six Monarch butterflies?**

*Student answers will vary. There may be a difference in fore wing length between males and females. There may have been a difference in the amount of food available to the Monarch butterflies when they were larvae, and this is a factor in their fore wing lengths as adults.*