

**Grade level:** 1-3

**Academic Standards**:

**Time:** 30 minutes

**Logistics**: Divide the class into small groups.

**Materials**:

-Crickets

-Data sheets (below)

-Food choices: lettuce, carrots, orange, nuts

-Graph paper and colored pencils

**Background:** The goal of this lesson is for students to understand the steps of the scientific method and practice scientific reasoning. They will do this by developing a prediction about cricket food preferences, creating and conduct an experiment to test their prediction, and graphing and interpreting their data.

**Preparation:** Get crickets from a pet store (or can order online) and divide them into enough small containers for each group to have one. Prepare the food choices for the crickets (pieces of lettuce, carrot chunks, orange slices, and nuts).

**DO - Activity**:

**1.)** *Setting the stage* Give each group a container of crickets. Give them a few minutes to observe the crickets. Help them distinguish adult versus juvenile crickets as well as males versus females. Juveniles are smaller and do not have fully developed wings like adults do. Adult males have two long tails, while adult females have what looks like an extra third tail in the middle. This is actually something they use to lay their eggs (on ovipositor)! Tell the students that their goal today is to figure out what their new cricket friends like to eat!

**2.)** *Making predictions* Show the kids the four food choices you have available (lettuce, carrot, orange, nut). Have the kids in each group together make a prediction as to which of the foods crickets will eat and which they won’t eat. The next step is to design an experiment to test the prediction. Ask the kids how they would do that. Guide them towards a choice test – they place different food choices in the cage and see whether one or more crickets chooses to feed on it during the 5 minute experiment. If a cricket touches one of the food choices, the research group should put a tally mark next to that food on their data sheet in the ‘touches food’ column. If a cricket really eats one of the food choices (you can see this if you are watching closely), the research group should put a tally mark next to that food in the ‘eats food’ column on their data sheet. For each cricket cage, assign kids different jobs (e.g. note taker, carrot and lettuce observer, nut and orange observer). *Before* you begin feeding the crickets, ask them what will happen if their prediction is correct AND what will happen if their prediction is not correct.

**3.)** *Collect data* Have each group put the food choices in the container and begin the experiment. Students should observe the crickets for at least 5 minutes and make check marks for each food the crickets choose to eat. At the end of the time period remove the food. Remind the students that this is not a game with winners and losers – this is real science and the important thing is to count accurately, not to get the most crickets.

**REFLECT**

Have each group count up their tallies for numbers of crickets touching and eating the foods. Discuss how scientists put data like these into graphs. Take out the graph paper and invite each child to draw a rectangle (bar graph) for how many times a cricket ate the food they were watching. Plot how many crickets were on each food type at the end of five minutes.

*Discuss the results:* Are there any conclusions we can draw about what kinds of foods crickets prefer? Do all crickets appear to like everything? Do all the crickets eat the same things?

**APPLY**

Some of the crickets are male and some are female (or you can divide by adult and juveniles –whichever is most obvious). Repeat the experiment but this time have one child observe the male crickets and other child observe the female crickets. After the experiment concludes, create a new graph using yellow stickers for the male and purple stickers for the female. What can they conclude from the results?

**Supplementary information**:

**Cricket facts:** Crickets belong to the order Orthoptera along with grasshoppers and katydids and belong to their own family, Gryllidae. While most orthopterans are plant eaters, these crickets are omnivores (as you will not doubt figure out observationally!). Crickets are known for their song, produced exclusively by the male using a file and scraper structure on his forewings. You can recognize the adult male by this structure which appears as crinkles in his wings. Males sing to attract females and to defend territory. Interestingly, crickets have ears in their legs. Adult females have a distinct dark ovipositor that they stick into damp sand when they are ready to lay eggs. Juveniles are smaller and have short wing buds.

**Data Sheets:**

|  |  |  |
| --- | --- | --- |
| Food | Number of crickets touching food | Number of crickets eating food |
| lettuce |  |  |
| orange |  |  |
| nut |  |  |
| carrot |  |  |

|  |  |  |
| --- | --- | --- |
| Food | Number of crickets touching food | Number of crickets eating food |
| lettuce |  |  |
| orange |  |  |
| nut |  |  |
| carrot |  |  |