

### Material Needed

- Portion cup w/ lid, 2 oz or equal size
- 2 flex straws
- Clear plastic wrap
- Filter materials: cheese cloth, gauze, nylon stocking, or fine netting
- Single hole punch
- Tape
- Scissors
- Pen or pencil
- Optional: Magnifier, bug-sized “practice object” (grain of rice, paper wad)

### Grade Range

K-2 (with adult supervision)  
3-5

### Topics/Skills

Science: Observation,  
External Structures,  
Biodiversity

### Learning Standards

NGSS: [Structure & Function](#),  
[Organization, Biodiversity & Humans](#)

### Duration

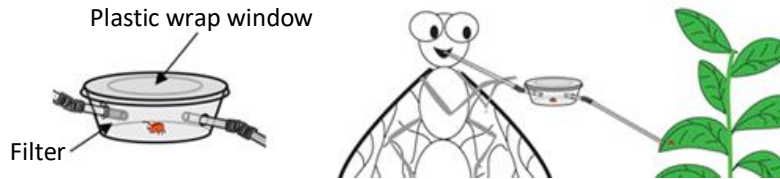
20-25 minutes

### Prep Time

10-15 minutes

## The “Bug Vac”

### A Safe, Humane Way to Collect and Observe Small Creatures



This device provides a simple way for students to learn about biodiversity by collecting and observing insects at home in the yard or other natural places.

### Activity Challenge

Create a bug vacuum to gently collect and study small creepy crawlies.

### Preparation

1. Review the materials list and gather the needed items.
2. Find a place (habitat) in which students can collect specimens.

### To Do

1. Punch 2 holes in a portion cup on opposite sides  $\frac{3}{8}$ " from the edge.
2. Insert the mouth end of a flex straw into one hole. If the straw does not fit tightly in the hole, wrap tape around the straw and reinsert again. If the hole is too small for the straw, carefully widen it with a pencil/pen.
3. Cover the mouth end of another flex straw with one or more layers of filter material (see materials list) to create a filter that will allow air to pass through but nothing else.
4. Wedge the covered end of the straw into the other hole, widening the hole as needed with pen or pencil.
5. Cut out the center of the portion cup lid so a  $\frac{3}{8}$ " outer rim remains.
6. Stretch a 4" square of clear plastic wrap over the open portion cup, put on the cut lid rim mentioned above, and snap the lid onto the cup.
7. Locate a suitable specimen to collect and study. Position the filterless straw so the end is very near the selected specimen.
8. Breathe in suddenly through the open end of the **filtered** straw. Repeat as needed until the specimen is transferred into the portion cup.
9. Observe the specimen through the clear plastic wrap “window”.
10. Remove the lid and gently release the specimen into a suitable habitat.

### Observations

Look at the external features of the specimen. Things to notice may include colors, number of appendages (legs, antennae, wings eyes), movements, etc.

### Extensions

- Put specimens in a terrarium for further study before releasing them.
- Use online resources to identify unfamiliar bugs.

### The Content behind the Activity

**Biodiversity** is a collective term referring to the variety of all plant and animal life on planet Earth. While it may not be practical for students to directly observe all forms of life living in every habitat, they can still appreciate the biodiversity that exists on our planet by observing a few readily available specimens in local habitats like their own backyard at home, city parks, or other places where familiar organisms are known to thrive.

The term “bugs” is commonly used to describe small **arthropods, invertebrate** animals (those without true backbones) having external skeletons called **exoskeletons**, segmented bodies, and paired jointed appendages. Examples of familiar arthropods include insects, spiders, and sow bugs, also known as “roly-polies”. Of the known animal species, more than 80% are arthropods!

In this activity students use a “bug vac”, which is basically a vacuum-based device used to collect small objects and creatures. This type of device is called a “pooter” by **entomologists** (scientists who study insects) and is traditionally made using a modified glass jar. Breathing in through the straw/filter creates a low-pressure area in the portion cup and the other straw. Outside air, that is at a higher pressure, moves toward the area of lower pressure, moving the selected specimen through the other straw and into the portion cup.