

Ants and Other Icky Critters

Teachers' Guide

Suggested Grades: 1-6

Objectives:

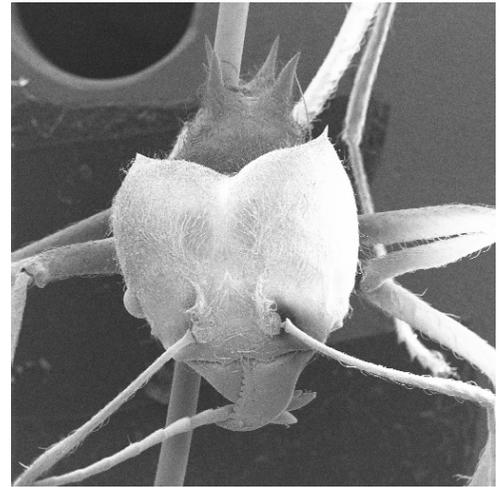
- Create and use categories to organize a set of objects, organisms or phenomena (S4-1).
- Select instruments to make observations and/or organize observations of an event, object, or organism (S4-2).
- Evaluate a simple procedure to carry out an exploration (S4-6).
- Identify and/or discuss the selection of resources and tools used for exploring scientific phenomena (S4-7).
- Evaluate observations and measurements made by other persons (S4-8).
- Demonstrate an understanding of the basic needs of living things (S4-16).
- Identify ways in which organisms react to changing environments (S4-17).
- Make inferences from observations of phenomena and/or events (S6-3).
- Recognize the advantages and/or disadvantages to the user in the operation of simple technological devices (S6-6).

Strategies:

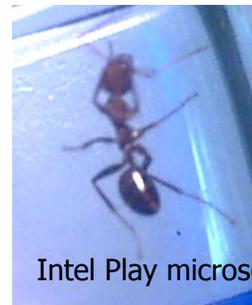
- We encourage you to collect specimens before we arrive. Follow the procedures from the Introduction to dry anything you intend to put under the SEM.
- Learn where there are live insects and spiders near your classroom so we can capture some for viewing with the light microscopes and day we arrive. We will provide small plastic containers that allow live viewing under these microscopes. (See picture at right.)

Under

- You are encouraged to explain the general procedures your students are to use on the bus. Encourage their feedback and evaluation of these procedures.
- Students will be able to take observations and measurements choosing from a variety of instruments.
- Students may gather video clips and photos of moving specimens using the Intel Play microscope. They can gather photos of SEM images also.
- Students should work in groups of 4 or 5 so they can gather a collection of observations and pictures of different specimens. They should take notes on one specimen each while the others assist, coach, and make suggestions. In this way, they will each have one picture and one set of observations to share with the group. They can later collaborate to organize their observations and conclusions as a poster or PowerPoint presentation.
- They should each sketch, photograph, and measure a different specimen. If it is alive, they should describe what it is doing and how it reacts to being put in a container under a microscope. They should ask questions about its habitat and how it was captured.
- Issues they should be considering include "What makes this specimen different from the others?", "How does this animal accomplish life functions such as breathing, eating, moving, digestion, etc.?", and "How does this animal interact with others of its kind?"



SEM Micrograph of
Leafcutter Ant



Intel Play microscopes the

Live Ant

Light Microscope
(LM)

- After being on the bus, students should work first in a large group and then in their smaller groups to develop a simple list of categories to organize their specimens. For example, an early response might be to divide them by size into small and large or by colors into red, brown, and black. A better response would probably start with the number of legs to distinguish insects from spiders, millipedes, and other animals. A further category for insects might divide those without wings from those that do. A more advanced group might divide roly pollies from spiders and ants from bees, crickets, and beetles, for example.
- They should work in their groups to organize their pictures, observations, and measurements. They should develop a theme for their poster. While they work on these, students can be assessed on their understandings of the objectives. This would be an ideal time to learn what instruments they used on the bus and why, what advantages and disadvantages various technologies have, and for students to evaluate the observations and measurements taken by their peers. You might have all the students exchange their notes with a peer within their groups and tell you something good and something that their peer could have done better.
- Groups should present their findings to the class. This "reteaching" provides additional opportunities for students to learn by sharing information with their peers.
- We suggest that you provide at least two grades for the project, one for the groups and one for the individuals.
- In follow-up, you might assess the understanding of the class and of individual students by asking questions, such as "What do animals need to do to live?", "How would a spider react to a flood?", "How does an ant react to food being placed near its colony?", "What instrument would you choose to observe a live ant?", "What instrument would you choose to investigate the mouth parts of a bee?", "What instrument would you choose to measure the length and width of a worm?"
- Two great websites on ants are <http://www.discovery.com/stories/nature/ants/sites.htm> and <http://www.myrmecology.org> .
- Another fabulous resource is the Ohio Ant Survey. A teacher workshop information packet can be obtained from TECH TREK or from Gary A. Coovert, Boonshoft Museum of Discovery, 2600 DeWeese Parkway, Dayton, OH 45414.
- This group encourages students of all ages to collect ants, recording information such as date, location, name of collector, and habitat or food plant where collected. For example:

Kettering, OHIO (Mont.)
 6 May 2000
 Carlton Bowers
 Found on dandelion leaf



LM Image of Leafcutter Ant that has been coated with gold for viewing under the SEM

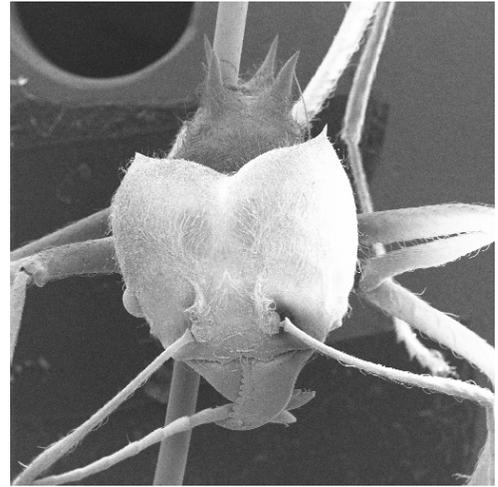
- Students can bring their specimens to the museum for assistance with identification.

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Student Guide

Objectives: You are going to work with a team to study several critters on TECH TREK Mobile Research Laboratory!

You will choose from magnifying lenses, rulers, and various microscopes to make observations and measurements. You should talk about what these animals need to do to live. You should think about how these animals are different and alike.



Leafcutter Ant under SEM



Procedures:

1. Safety first! Be patient and take your turn! Ask before touching specimens or operating equipment!
2. You will each make and record observations about one animal you find on the bus. It needs to be a different animal than the ones the rest of your group does.
3. You will choose from various technologies to observe your specimen. The possibilities include

magnifying lens ruler light microscope SEM computer database
 Intel Play microscope

Your group should use each of these at least once. Check the ones your group uses and circle the one(s) you use for your observations.

4. Measure and sketch or photograph your specimen.
5. When you are not recording information, you should help the others in your group to make their observations and measurements.
6. Bring your observations and measurements back to class for your group to work on your poster presentations.

Observations and Measurements:

Student Name _____ Date _____