

4. Catching the Ants: Teacher only!
5. Visit the bait cans. Ask students which bait was the most popular. Were their predictions correct?
6. When one can is full of ants (15-20 ants is ideal), put on the gloves and, using the forceps or tweezers, put the entire can into the zip lock bag. If you can, pick up some stray ants and place them in the bag as well. Zip the bag tightly. Bring the bag back inside and put it into a refrigerator for 10-15 minutes to slow the ants down.
7. Take the zip lock bag out of the refrigerator. Wearing your gloves, stand over the big jar and quickly open the bag, remove the can and shake ants out in the jar. Shake remaining ants into the jar. Place the nylon over the mouth of the jar and put on the rubber band.
8. Cover the jar with the piece of black paper. Tape edges together, and place out of direct sunlight. Ask students not to touch the jar while the ants get used to their new temporary home.
9. Remove the paper after a day and check for tunnels. Every day or two, remove the nylon and add a TINY piece of the bait food to the top of the sand.
10. This is a temporary ant nest and the ants will not survive without a queen. It is recommended that you set the ants free after 1-2 weeks. They should be released in the same spot in which they were found.

Observing the Ants

1. Have the ants built special chambers for food or resting?
2. Ants will remove their dead sisters from the nest. Are there any dead ants on top of the sand?
3. Do the ants keep building new tunnels? Do the tunnels ever collapse?

Vocabulary

abdomen	larva, larvae
antennae	pheromones
complete metamorphosis	pupa, pupae
egg	repletes
exoskeleton	thorax
head	

Suggested Internet Resources

Periodically, Internet Resources are updated on our Web site at www.LibraryVideo.com
www.entsoc.org — This site includes links to just about any bug-related site on the Web.
www.sasionline.org — The Sonoran Arthropod Studies Institute is a non-profit organization dedicated to arthropod research and education projects.
www.nhm.org — The Natural History Museum of Los Angeles County's web site includes pages devoted to the Insect Zoo.

Suggested Print Resources

Cole, Joanna. 1996. *The Magic School Bus Gets Ants in its Pants*. Scholastic Books, Inc. New York, NY.
 Chinery, Michael. 1991. *Ant (Life Story Scenes)*. Troll Assoc.
 Holldobler, B. and E.O. Wilson, 1994. *Journey to the Ants: A Story of Scientific Exploration*. Harvard University Press, Cambridge, MA.
 Hoyt, E., 1996. *The Earth Dwellers: Adventures in the Land of Ants*. Simon and Schuster, New York, NY.

TEACHER'S GUIDE

SARAH S. THOMPSON
Education Specialist — Insect Zoo
 Natural History Museum of Los Angeles County

ARTHUR V. EVANS, D.Sc.
Insect Zoo Director
 Natural History Museum of Los Angeles County

COMPLETE LIST OF TITLES

- ANTS
- AQUATIC INSECTS
- BEES
- BEETLES
- BUTTERFLIES & MOTHS
- CRICKETS, GRASSHOPPERS & FRIENDS
- FLIES & MOSQUITOES
- HOUSE & BACKYARD INSECTS
- LADYBUGS & FIREFLIES
- SPIDERS & SCORPIONS

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ANTS

Grades 1-6

This guide is a supplement, designed for educators to use when presenting this program in an instructional setting.

Before Viewing: Research in learning suggests that it is important for the teacher to discover what the students know — or think they know — about a topic, at the start of a new unit, so that their accurate conceptions can be validated and reinforced, and their misconceptions identified and corrected. Therefore, create an "Everything We Know About..." list. Preview key vocabulary words and have students raise questions they hope will be answered by this program. Most importantly, students should be told to pay close attention to the show, so that after viewing the program, they will be able to tell whether or not the facts/beliefs they put on their list were scientifically accurate.

After Viewing: After a brief discussion about the program, challenge your students to prove or disprove the accuracy of the facts they put on their "Everything We Know About..." list. Discuss what else they learned and any additional questions they may have. Encourage students to research the topic further with the Internet and print resources provided.



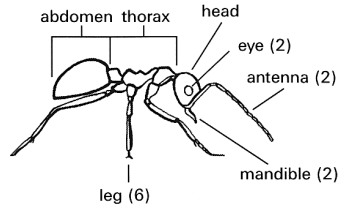
Ants are insects, complete with a hardened outer shell called an exoskeleton and three body sections. The head bears the mouth parts, eyes and antennae; the thorax contains muscles needed to move the six legs (in adults) and wings, if present; and the abdomen houses the internal organs of respiration, digestion and circulation.

All ants are social, living in highly organized colonies, which are comprised primarily of females. The individuals of each colony are divided into castes. Each caste is distinguished by its body shape and the specific tasks performed. This division of labor insures the success of the colony. Worker ants scout for food, dig new nest chambers and care for the young. Soldier ants defend the colony from intruders. The queen is the only female in the colony capable of reproducing. The winged male ants exist for only one purpose, to mate with winged queens during the nuptial flight so that they can establish new colonies. Although most ants are small, less than 1/4" long, their strength lies in their social organization, with thousands of individuals working cooperatively to function as a "superorganism."

Ants can function as a colony because they use a highly effective form of chemical communication. They emit pheromones, or chemical odors, that convey important information necessary for survival. Foraging workers will lay down a scent trail for their sisters to follow, so that they can help bring food back to the nest. You can break this trail by dragging your finger across it. The ants will be temporarily confused, but will eventually pick up the trail on the other side of the break. Pheromones also alert ants to dangerous situations, so they can mobilize to defend the colony.

Life Cycle

Ants undergo complete metamorphosis, four distinct stages in their life cycle: egg, larva, pupa, and adult. Upon hatching, the larvae are cared for by workers sometimes known as nurse ants. After several weeks the larvae form pupae, sometimes within a silken cocoon, and begin their amazing transformation into an adult ant. Adult workers and soldiers generally live for several weeks, while the queen may live up to 15 years.



The Queen

Larval queens are fed special foods that encourage the development of their reproductive organs and wings. Adult queens, along with winged males, leave the colony to participate in mating swarms or "nuptial flights." After mating, the queen begins the task of establishing a new colony. Upon landing, she loses her wings, digs a small nest and lays several eggs which will become the first generation of workers. When her daughters emerge from their pupae, they take over many of the duties of the new colony, such as caring for larvae, enlarging the nest and finding food.

Ant Diversity

The success of ants is a direct result of the fact that they are the only social predators occupying the soil and ground litter. Without competition, ants have been able to thoroughly exploit this habitat and diversify, evolving numerous strategies for survival.

For example, there are ants that protect aphids and caterpillars from their enemies in return for the sweet liquid they produce, honeydew. Migratory ants, some of which are known as army ants, move through their habitats with deadly efficiency, consuming vast quantities of insects and other small animals.

Honey pot ants, residents of the desert, have a fascinating way to get through the dry season: they overfeed ants in the colony until their abdomens are literally bursting at the seams. These living reservoirs, called "repletes," swell up to the size of marbles. They can't walk, so they just hang from the ceiling of the nest and regurgitate stored food to feed their sisters.

Leafcutter ants, found in the tropical regions of North and South America, are among the few insects that grow their own food. Foraging leafcutters snip off pieces of leaves and carry them back to the colony. Thousands of leafcutters, working in unison, can strip a tree in a matter of days. The ants carry the leaf bits back to the colony, where they are mulched and placed in a special chamber in the nest. The mulch is used to cultivate a special type of fungus, which is then eaten by the ants.

Make a Classroom Formicarium

Ants are easy to collect and observe in the classroom. With simple household materials, you can make a formicarium, or artificial ant nest. Remember, many ants can bite or sting! When collecting ants, always use gloves and forceps.

(Continued)

To Collect Ants

- 3 or 4 empty tuna fish cans, rinsed
- Featherweight forceps or tweezers
- Plastic zip lock bag gloves (ants can bite!)
- Bait food such as grass seed, wheat germ, bacon bits, honey, tuna fish

To House the Ants

- A one gallon glass jar, without lid
- A smaller glass or plastic jar (quart-sized), with lid, to fit inside the larger jar
- Sand (not beach sand, it is too salty)
- Spray bottle
- 1" square of sponge, moistened
- Piece of nylon pantyhose and a rubber band
- Piece of black paper or newspaper to fit over jar and block sunlight

Ant Collecting With Your Class

1. Search for ants in the yard outside with your class. Discuss ant anatomy (mandibles, or jaws, and stingers) and the fact that ants can sting and/or bite, so only an adult should handle the tweezers and cans of ants.
2. Divide your students into four groups and tell them that they will each test one type of food. Assign each group a type of bait (grass seed, tuna, bacon bits and honey). Have the entire class predict which food the ants will like best. Record the predictions on a piece of chart paper.
3. Give each group an empty tuna can and have them add a tiny bit of their bait to the can. Look over the chart and discuss predictions again. Record group names on the cans with a magic marker and place them in shady spots outside.
4. Check the bait cans several times during the day to note ant activity. If none of the bait has been visited by ants, move the cans to another spot.

Set Up the Formicarium

1. Place the smaller jar, with lid on, inside the larger jar. Fill in the space around the smaller jar with sand so that it is level with the lid.
2. LIGHTLY mist the top of the sand. The sand will get moldy if it is too wet. Place the moistened sponge square on the sand.
3. Cut a square of nylon hose so that it fits on the open mouth of the jar and secure tightly with the rubber band. Check to make sure no ants can escape.

(Continued)