A large, vibrant green leaf with detailed vein structure is the central focus. Three black ants are positioned on the leaf: one on the left side, one near the top center, and one in the upper right corner. The background is plain white.

Ants: Cooperative Colonies

Activities for children and
adults that build upon PlayTrail
experiences outdoors



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Getting children comfortable in the outdoors may be one of the greatest gifts we can offer the next generation. Given what we know about the physical and psychological consequences of a sedentary, electronic media-dominated lifestyle, it also might be one of greatest health tips we can offer. A childhood rich in outdoor experiences provides an inexpensive antidote for a number of medical problems, including depression, attention deficit disorder, and obesity.

But there is more. Letting young children freely explore their world outdoors can instill a lifelong connection to the environment. It can also help cultivate an ethic of caring for the environment.

The role of adults in this process focuses less on teaching and more on coaching. While most children want to explore their world, some may be hesitant or even fearful. Parents and other caregivers need to be there to offer encouragement and guidance without stifling the important work called play.

Tips for adults

We offer the following tips to help make the most of your PlayTrail explorations.

1. Find activities in these booklets that are appropriate for your child's age and interests, as well as environments that are readily accessible to you.
2. Share the booklet with your child in advance.
3. Let your child initiate the exploration, but be ready to offer suggestions in the event encouragement is needed. Consider the booklet's investigations to be jumping-off points that pique curiosity.
4. Avoid the tendency to teach. Share the information you glean from these booklets as "incidental" points of interest.
5. Model positive behaviors and respectful attitudes toward nature.
6. Respect your child's fears. Never force a child to touch something they do not want to touch. Courage and interest come about through positive, graduated experiences.
7. Foster play and accept the fact that dirty hands, mud-caked shoes, and wet clothes often come with it.
8. Avoid the tendency to "helicopter." Too often we over-protect and stifle explorations inadvertently.

On the trail

Ants are hard-working animals. Most live cooperatively in an organized community called a colony. Each member of the colony has one task, such as finding food or feeding larvae. Because each ant focuses on one specialized job, the colony stands a strong chance of surviving and thriving.

Most of the colony's work is done by female workers. Their primary job is to gather food. They also are responsible for digging tunnels, hallways, and underground chambers. (Did you climb on the Playtrails ant hill? Do you remember winding through the "underground" tunnels?)

Scout ants do the initial searching for food. Once they find it, they leave a trail marked with chemical signals other ants can detect. Soon scores of worker ants will be on that trail, hauling food supplies back to the colony.



Ant safari

Pack some bread crumbs and look for an ant trail in your yard or a nearby park. When you find one, try to follow it from one end to the other. Your challenge is to find both their food source and the colony.

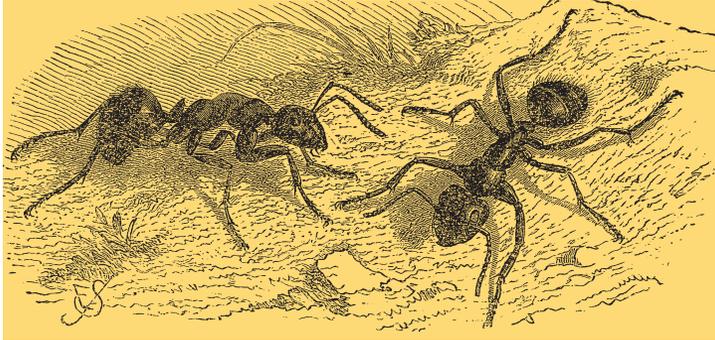
Lay a stick or stone directly on the trail and watch what the ants do. Do they create a detour trail that eventually links back to the old trail? Do they create a new trail? Now place some bread crumbs a few inches away from the trail and watch what the ants do. Do they succeed in finding your food?



Trail Tricks

Pack a small amount of salt and sugar in separate containers. Several feet before your bread crumb station, place ½ teaspoon of salt six inches to the left of the trail and ½ teaspoon of sugar six inches to the right of the trail. Which food do they visit: the sugar or the salt? Do they start bringing it back to the colony? How do they carry each particle of food?

Worker ants grip food in their powerful set of jaws. Sometimes the food particles are very large and sometimes very heavy (like 20 times an ant's body weight). Holding a large seed in their mouth is like you holding a basketball in yours!



Ant talk

Most ants have poor eyesight, but powerful senses of smell and touch. Antennae attached to their head receive signals through scents and vibrations. Chemical signals, or pheromones, communicate many different things. They mark food trails, signal alarms, and perform identify checks. If an ant meets another ant and it has the same smell, it knows it is a member of the same colony. If an ant is crushed, it will send an alarm signal, calling other ants to attack by biting, stinging or spraying formic acid.

Antennae are also sensitive to touch. Ants will send signals by touching and stroking each other's bodies with their forelegs and antennae. Some ants are even head bangers! They bang their antennae against a hard surface to send warning signals as vibrations other colony members will feel.

Talking heads

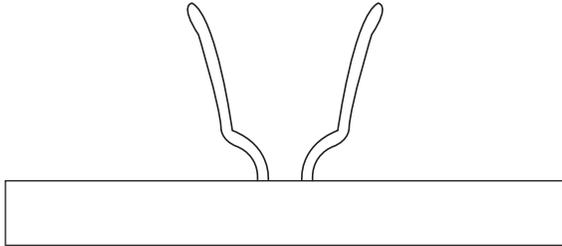
Back on the ant trail, watch for communication behavior among ants. Do you see ants touching each other with their antennae when they meet? Are they smelling each other or the food they are carrying?

A headband fit for an ant

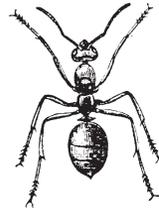
Materials: Red or brown construction paper cut into a strip 1" x 24" for the headband; tape; and either two pipe cleaners and beads or red or brown construction paper cut into antennae based on the template below.

Procedures: Using the template as a guide, cut out the construction paper to make two antennae or give your child the pipe cleaners and beads and let them build their own. Attach a bead to the end of each pipe cleaner, or, if you have several small beads, stack them onto the pipe cleaners to make segmented antennae. Bend each pipe cleaner in half to create anatomically correct "elbowed antennae." Attach the pipe cleaners to the headband with tape and then tape the headband so it rests snugly on your child's forehead.

If you have more than one child wearing an antennae headband, have them "talk" to each other like ants!

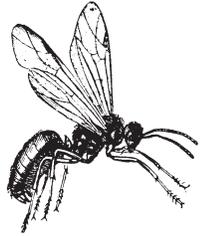


One colony. Many jobs



Ants have different roles in the colony. Sterile wingless females are workers or soldiers. Fertile winged males are drones and fertile winged females are queens. The job of a drone is to eat and mate; the job of the queen is to reproduce. The job of a worker is more complicated. A young worker first cares for the queen and the young. Later, it moves onto digging tunnels and chambers, and eventually to foraging and defending the nest. Some workers become soldiers. Their slightly larger size (and stronger mandibles) gives them an advantage in fighting.

It is not likely you will see either the queen or her drones, unless they are flying. After the "nuptial flight," a queen sheds its wings, leaving stubs in their place. Queens are much larger than workers.



Workers and soldiers

While in a nearby park, search for an ant colony under a log or a rock. (If you roll a log or lift a rock, always make sure the object moves toward you to ensure the space beneath it opens away from you.) If you happen to discover an ant colony, study its members from a distance. Can you see any winged drones, wingless workers, or tiny white eggs and larvae? Watch for “soldier” behavior among the workers. If an alarm signal is given, do soldiers rush to the scene?

When you are done looking, be sure to place the log or rock in its original position.



Safety tip: Ants can sting and bite, so it is best to avoid touching them.

Citizen Science

Biologists conduct large research studies to catalog how many different kinds of animals exist regionally or even nationally. Sometimes they just focus on one particular species. Often they ask for help because the scope of their research is so large. “Citizen science” invites individuals to record their observations about a certain kind of animal on a website. By doing this, ordinary people contribute important information to a central database that is analyzed by trained biologists.

There are several ant-based “citizen science” projects your family can become involved in. The best way to find out about active ones in your area is to look them up on the Internet or check them out at www.thedailygreen.com. These projects often are conducted by natural history museums, nature centers, and national parks.

Conservation message: Some ant species are endangered. Others are problematic. For example, non-native Argentine ants and red fire ants pose serious problems in the United States. They are a nuisance around homes, a costly pest to agriculture, and an ecological threat to native ant species. In addition, red fire ants can inflict a painful sting.

More titles in the Playtrails series:

Bees: fantastic farmers

Birds: engineers by instinct

Butterflies: the magic of metamorphosis

Forest filtration: nature's air filter

Habitats: there's no place like home

Leaves: hidden colors

Pond Life: a busy ecosystem

Spiders: silk spinners

The Forest Floor: a living layer



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