



Bosque Leaf Hunt Relay

This activity was adapted from the activity “Leaf Hunt Relay” from Project Learning Tree and the Insect Variation developed by Bob Cain, Forest Entomologist for New Mexico State University Extension Service.

Description: Students participate in relay teams to identify leaves of bosque plants. For each race, the student team mimics a bosque arthropod and learns about the relationships between these animals and plants.

Objective: Students will:

- learn characteristics of arthropods;
- be able to identify some bosque plants by their leaves; and
- learn about plant/insect relationships in the bosque.

Materials: eight boxes or large paper grocery bags (fit over team members’ heads)
two or four “bug eyes”—compound eyes—or poke several holes in the base of two paper cups, a set for each team

Background: Plants and insects are highly dependent on each other. Many plants rely on insects for pollination in order to make seeds and reproduce. Likewise, many insects rely on plants for food from leaves, pollen, seeds, roots, etc. This activity helps emphasize the importance of this dependence between the plant and insect world. It is also a “fun” environment to present some basic information about insects and build some appreciation for the insect world. Here are some general concepts on arthropods. Specific information on arthropods in this activity can be found in the *Procedures* section or Appendix E.

All insects have six legs.

Insects are the largest group of animals. One million species have been named, which is probably only one percent of the estimated number of insects.

20. Bosque Leaf Hunt Relay

Grades: K–6

Time: 30–45 minutes

Subjects: science

Terms: *pollination, arthropods, compound eyes*





Most insects have wings.

There are insects that humans consider good and bad:

- some of the negative things insects do are: spread disease, kill crops, cause discomfort, destroy homes (termites), kill trees; and
- some of the positive things insects do are: pollinate flowers, kill other insects, provide food for birds, fish, etc., provide honey.

Spiders, isopods (pillbugs), centipedes, and millipedes are not insects. Spiders have eight legs. Pillbugs have 14 legs. Centipedes and millipedes have many legs.

Procedure:

1. Collect leaves from plants in the bosque as a classroom project or on your own. Avoid stripping live leaves if at all possible; use leaves which have fallen beneath the tree, shrub or herb. For future use, you may want to press the leaves, mount them, and laminate or cover with contact paper. Here are the plants that are suggested for this activity, but other plants can be substituted depending on what is available (or you may use plant cards from the “Who Grows Where?” activity):

saltgrass	Russian olive	cattail
coyote willow	saltcedar	cottonwood (2)
sunflower	New Mexico olive	yerba mansa
false indigo bush	prickly pear	
2. Review the names of each plant and leaf identification characteristics with students.
3. Divide the class into at least two relay teams. Ideally, each team should have at least ten members. Team members should line up single file, with teams side-by-side.
4. Separate the leaves into piles so there is a pile of each kind of leaf for each team. Set the piles approximately 75-100 feet (22.5–30 meters) from each team.
5. Explain to the students that each team will supply a particular “arthropod” to find a particular plant. Arthropods are animals that have jointed legs and exoskeletons (skeletons on the outside). Arthropods include insects, spiders, crustaceans, centipedes and millipedes. Each team will need to determine how many legs the assigned arthropod has, and how many students they need to make a team with that many legs. For each round, have a short discussion about the animal, have students form teams, and tell them which plant they are looking for. The team that stays together, moves in the described manner, and selects the right plant first wins that round.



Arthropods

Harvester Ant

Description: Six legs requires three students. Two eyes means that the back two students must keep their heads down; three body segments requires that the back students keep their hands on the hips of the student in front of them.

Background information: Harvester ants live in large colonies in burrows that can be nine feet deep or deeper. The entrance is usually on the south side of their mounds. They mostly eat small seeds but eat an occasional insect for protein.

Situation: The harvester ant is looking for seeds from a saltgrass plant.

Robber Fly

Description: Six legs requires three students. Two eyes means that the back two students must keep their heads down; three body segments requires that the back students keep their hands on the hips of the student in front of them. Compound eyes means that the front student must look through a “bug-eye” or paper cup with several holes punched in the bottom. One pair of wings requires that the first student flaps his/her elbows while holding the bug-eyes.

Background information: Flies are a large group of insects with only one pair of useful wings. The robber fly is a fairly large fly that captures other insects as it flies. Its young develop in decaying vegetation.

Situation: This fly is waiting for food on a cattail.



Cicada

Description: Six legs requires three students. Two eyes means that the back two students must keep their heads down; three body segments requires that the back students keep their hands on the hips of the student in front of them. Compound eyes means the front student must look through a “bug-eye” or paper cup with several holes punched in the bottom.

Background information: The winged adult cicada is a robust insect often heard buzzing in the bosque. The larvae live and grow underground for several years. In their final nymph stage, they climb up trees and emerge as adults.

Situation: A cicada nymph is climbing up a saltcedar trunk.

Tarantula

Description: Eight legs requires four students. Eight eyes; the male is near-sighted, so the students must wear a box or bag over their heads so it is hard for them to see; back students keep their hands on the hips of the student in front of them.

Background information: Tarantulas are not aggressive and have only a mild poison. Males live eight to ten years in burrows. When the male is sexually mature, it goes looking for a mate. The male is very near-sighted and can see only about two feet. The females generally never leave their burrows.

Situation: The male tarantula is looking for a female with a burrow under the New Mexico olive.

Field Cricket

Description: Six legs requires three students. Two eyes means that the back two students must keep their heads down; three body segments requires that the back students keep their hands on the hips of the student in front of them. All of the team must jump.

Background information: Crickets eat dead leaves and, before the arrival of isopods to the bosque, may have been the major consumer of cottonwood leaves.

Situation: A cricket is looking for cottonwood leaves to eat.



Eight-eyed Jumping Spider

Description: Eight legs requires four students. Eight eyes; have students line up side-by-side, with arms linked across shoulders; students must jump to move forward.

Background information: The eight-eyed jumping spider is an aggressive predator and doesn't make webs.

Situation: The spider is hungry and looking for food on a false indigo bush.

Pinacate Beetle or Desert Stink Beetle

Description: Six legs requires three students. Two eyes means that the back two students must keep their heads down; three body segments requires that the back students keep their hands on the hips of the student in front of them. Compound eyes means that the front student must look through a "bug-eye" or paper cup with several holes punched in the bottom.

Background information: The pinacate beetle is a large black beetle that lives under stones and logs. When agitated, it will stand on its head and release a foul-smelling vapor.

Situation: The beetle is looking for food under a prickly pear.

Pillbug or Isopod

Description: Fourteen legs requires seven students. Two eyes means that the back six students must keep their heads down; the back students keep their hands on the hips of the student in front of them.

Background information: Pillbugs were introduced to this continent over 500 years ago with dirt that was used to stabilize sailing vessels but removed to make room for cargo space on return trips. Today these little animals are the major consumers of dead plant material in the bosque.

Situation: A pillbug is looking for dead coyote willow leaves to eat.

Black Widow Spider

Description: Eight legs requires four students. Eight eyes.

Background information: The bite of a black widow spider is poisonous to humans, but usually will not kill a person. Most black widow bites occur in outhouses. Black widows catch their prey in webs.

Situation: The female black widow is spinning a cobweb in a Russian olive tree.



Fall Webworm

Description: Has three pairs of true legs and five pairs of prolegs (leg-like appendages); requires eight students. The fall webworm moves like an inch-worm; students have hands on hips of team member in front of them. The first student moves forward as far as possible without the back team member moving. Then the first student stops, while the remainder of the team moves as close to the first person as possible. Once the back person stops, the first person can go again and the process is repeated.

Background information: The fall webworm is a late-season caterpillar that feeds on foliage from July through September. Because they do not emerge until July, their presence does not usually impact the tree's long-term health. They live gregariously in large webs where they stay all the time to eat, sleep and even poop!

Situation: A fall webworm is returning to his tent on the limb of a cottonwood.

Millipede

Description: Has many legs; all team members participate. A millipede has two pairs of legs per body segment; the back students keep their hands on the hips of the student in front of them. All students must shuffle their feet to move.

Background information: Millipedes are round, and eat plants. They do not bite or sting people.

Situation: The millipede is eating decomposing sunflower leaves.

Centipede

Description: Has many legs; all team members participate. Since the centipede is flat with one pair of legs per body segment, students will bend over at the waist, the back students holding onto the waist of the student in front of them. The legs are extended to the sides of the centipede, so students run with their legs spread wide apart.

Background information: Centipedes are predators that eat small insects and other arthropods. They paralyze their prey with poison in their jaws. This poison is also venomous to people and can cause a painful bite. Centipedes are flat because they spend a lot of time crawling underneath rocks and logs.

Situation: The centipede is looking for insects beneath the yerba mansa plant.