

## Living Things • Enrich

## How Many Species of Animals Are There?

There are more species of insects than any other type of animal on Earth. The majority of animals, including insects, live in the tropics. If you can estimate how many species of insects there are in the tropics, you can get a pretty good estimate of the number of species of animals on Earth.

Over the years, entomologists (scientists who study insects) have been discovering and naming new kinds (species) of insects, and now over a million kinds of insects are known. Dr. Terry Erwin, an entomologist at the Smithsonian Institution, studies beetles. Beetles make up a large percentage of insects and related animals. By estimating the number of species of beetles in the tropics, Dr. Erwin was able to estimate the total number of species of animals in the world. Dr. Erwin used the following information to arrive at his estimate:

- Dr. Erwin found 1,200 species of beetles living in *Luehea seemannii* trees.
- Of those 1,200 species of beetles, he estimated that 163 are found only in the *Luehea seemannii* tree, and not in other species of trees.
- There are about 50,000 species of trees in the tropics.
- Beetles make up about 40% of insects and related animals.
- Dr. Erwin estimated that there are about twice as many species of insects and related animals in tropical trees as there are on the ground of the forest.

Answer the following questions on a separate sheet of paper. Use a calculator to make the calculations.

1. If each kind of tree has 163 species of beetles that are found only on that type of tree but no others, how many kinds of beetles are there in tropical trees?
2. Using your answer from question 1, estimate how many species of insects and related animals there are in tropical trees.
3. Using your answer from question 2, estimate how many species of insects and related animals are on the forest floor in the tropics.
4. Using your answer from questions 2 and 3, estimate how many species of insects and related animals there might be in the trees and the forest floor together in the tropics.
5. Why did Dr. Erwin focus on tropical forests to estimate the total number of animal species in the world?
6. What are some likely sources of error in Dr. Erwin's estimation method?