



WHAT IS DIVERSITY?

Use beans to simulate and compare different patterns of forest diversity



GRADES 4-6

MATERIALS

- bag(s) of 15-bean soup mix (dried beans)
- bag(s) of 3-bean or 5-bean soup mix (dried beans) or any combination of dried beans you can find
- empty film canisters or baby food jars

KEY WORDS

- diversity

STANDARDS

- SCI.6.3.3

OBJECTIVES

- Students will learn about the concept of diversity as it applies to ecosystems.
- Students will compare the diversity of a typical temperate forest with that of a tropical rain forest.

BACKGROUND INFORMATION

- Rain forests are home to a huge variety of plants and animals.
- It is estimated that these ecosystems, which cover only 6 percent of the earth's land area, are home to 50 to 90 percent of all species on earth, resulting in an incredibly diverse array of life in the rain forests.
- In a single acre of tropical rain forest, more than 200 species of trees may be present. Only a few specimens of each species are scattered throughout this acre.
- Each tree may have a specific pollinator (insect, mammal, or bird) and this creates an even more diverse environment.
- Diversity can protect the forest in the event of a natural disaster, such as disease; if one or two tree species are susceptible, only a few trees per acre may be lost.
- Diversity has a down side, too; a single species of tree may be the sole support of several insect species. When the tree is gone, there are no other members of that species nearby to assume its role.
- Temperate forests, like those found in Indiana and much of the northeastern quarter of the United States, are less diverse than tropical rain forests.

PROCEDURE

- Provide each student or team of students with two film canisters.
- One canister should be filled with the 3- or 5-bean soup mix. Label this as canister A. The other should be filled with the 15-bean mixture. Label this as canister B.
- Have students choose one of the canisters. Tell them that each type of bean in the canister represents one tree species.
- Have students dump out the beans and sort them by type. Count the number of different types of beans, and consider how many of each type of bean are present in the canister? Have the students record their results.
- Do the same with the other canister. Compare the results. Have students consider which canister would represent the rain forest? Which would represent a temperate forest? Which is more diverse?





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EXTENSIONS

- Have a discussion with the students and ask them the following questions:
 - What would happen if half of each tree species in the rain forest were destroyed?
 - Would some of the students' "forests" have only one specimen of a particular tree left? How would this affect the animals that depend on that tree?
 - Which ecosystem is more stable (less likely to be affected by change?) Why?
 - Which would have more difficulty returning to its original state once disturbed?
 - How does this exercise help explain the fragile nature of some rain forest ecosystems?

