

Numbers, Numbers, and More Numbers

Overview

Students read a paragraph about the Earth's biological diversity and must answer a series of mathematical questions about that diversity.



Title

Numbers, Numbers, and More Numbers

Investigative Question

What are some of the many ways in which we use Earth's biodiversity?

Overview

Students read a paragraph about the Earth's biological diversity and must answer a series of mathematical questions about that diversity.

Objective

Students do elementary arithmetic to determine some of the many ways humans use biodiversity and also learn interesting facts about the Earth's biodiversity.

Materials

Per student: 1 copy of Student Pages 1 and 2.

Time

One 50-minute class period or less.

Advance Preparation

Copy needed materials for students.

Introducing the Activity

Write the numbers 1,400,000 and 53,000 on the board. Ask the class what the two numbers have in common. Allow for silly answers, but finally reveal that the first number is the number of described species (organisms that have been given a name) on the earth, while the latter is the number of described species found in Illinois.

Procedures

1. Distribute copies of Students Pages 1.
2. The information required to answer the questions on Page 1 is contained in the paragraph on Student Page 2. When students have read the dialogue and completed their answers, check them with the answers given below. The importance of this activity lies in the growing awareness of the many values of biodiversity.

Option: Distribute Student Page 1 only and have students fill out the page using their best guesses. Later, distribute another copy of Student Page 1 and Student Page 2 and have them fill out a second answer sheet. Poll the class to see how many they answered correctly without the paragraph.

Answers: 7%, 50%, 1.4 million, 250,000, 7,000, 80%, two dozen, 25%, 55,646, 3,200, 4 billion, 7 billion, 39%, 10%, 55%, 0.01%, 1

Assessing the Activity

1. Share the following paragraph with your students.

Part of the story of biodiversity, albeit a very small part, can be told in numbers. Although the diversity of life on Earth is enormous, we believe, at least superficially, that our existence hinges on a relatively few species. A vast, unknown number of species remain to be discovered, and many of these will unquestionably offer direct benefits to us. Their discovery, of course, hinges on their continued existence. The great tragedy of extinction is that it is irreversible.

Ask students to write a short paragraph on what this paragraph means to them.

2. Ask students to explain the meaning of the following statement in a short paragraph. “Wisdom dictates that we give existing organisms the benefit of the doubt.”

Extending the Activity

1. Have students make a list of all the different species of organisms they utilize in their daily lives. Don’t forget to have them include products from living organisms as well.

State Goals

6, 11, 12

Concept

Whether we like it or not, human existence depends on the Earth’s biodiversity. While we may only utilize a seemingly small percentage of the life on Earth, we are actually part of a much larger global ecosystem. In short, all things on the Earth are interconnected.

Safety and Waste Disposal

None required.

Student Page 1-Numbers, Numbers, and More Numbers

Part of the story of the importance of biodiversity can be told in numbers. Read Student Page 2-**Numbers Dialogue** and try your hand at finding the number in the left-hand column that completes the statement in the right-hand column.

	Tropical rainforests cover _____ of the Earth's surface, but contain more than _____ of the world's plants and animals.
39%	Approximately _____ organisms have been described and named by scientists.
0.01%	
55%	Of the _____ kinds of plants currently known, only _____ have been used for food by humans.
10%	
25%	As much as _____ of the world's food supply may be based on fewer than _____ species of plants and animals.
4 billion	
two dozen	For the past 25 years, _____ of all prescriptions for medicines in the United States contained chemicals extracted from plants.
250,000	
7%	In its _____ square miles, Illinois has about _____ species of plants.
7 billion	
3,200	Nearly _____ people in the world rely on plants as sources of drugs.
1.4 million	
50%	A wild grass recently discovered in Mexico, a perennial related to corn, may prove to have a value of nearly _____ dollars annually if it can be used to produce a perennial hybrid of corn.
7,000	
80%	
1	At the time of European settlement, forests occupied approximately _____ of the land that was to become Illinois; Illinois forests now account for about _____ of the state.
55,646	
	Prairie once covered about _____ of Illinois and was the ecosystem responsible for building the rich soil that covers much of Illinois. Today, prairie remnants make up less than _____ of the state.
	Agriculture as it is practiced in the Midwest consists of a series of fields in monoculture. A monoculture has _____ species of plant growing in it.

Student Page 2-Numbers Dialogue

Human existence directly depends on about 14,000 of the 1.4 million known kinds of plants and animals. Among the 250,000 species of plants, only 2.8% have been used as food by humans. In fact, less than 25 species of plants and animals provide food for 8 out of 10 people. How important are natural plants to our food supply? A wild grass found growing in Mexico, a perennial relative of corn, may be worth at least \$7 billion if it can be crossed with corn to produce a perennial hybrid (one that does not need to be replanted year after year). Plants are also important sources of drugs for humans. About 77% of the 5.2 billion people currently living rely almost entirely on plants for their drugs, and one in four prescriptions written during the past 25 years contained chemicals obtained from plants.

The biodiversity of our planet is being jeopardized largely by the destruction of habitats such as tropical rainforests. Although tropical rainforests occupy only 13,785,716 square miles of the 196,938,800 square miles of the Earth's surface, they contain more than half of all known species of plants and animals.

In Illinois we have destroyed much of our native landscape. Originally, forest occupied 21,702 of the 55,646 square miles of Illinois; today, only 5,646 square miles are forested. The situation with prairies is even more extreme. Although 30,605 square miles of Illinois was in prairie at the time of settlement, today only 0.01% of that remains. In these very small fragments of natural habitats, many of Illinois' 3,200 species of plants must live, isolated in a sea of agriculture where only a single species of plant occurs over immense areas.