

ACTIVITY

Calculating a Biodiversity Index

You and your team will investigate how scientists use the physical characteristics of living things to classify them. After you have completed the activity, respond to these questions in your journal.

- ▶ How do scientists calculate a biodiversity index?
- ▶ What is the value of a biodiversity index?

Gather with your team and choose a captain and a note taker for today. Before you begin your investigation, consider with your team what you already know about biodiversity. Use the questions below to structure your discussion and record your notes in your journal.

- ▶ How are living and non-living things connected?
- ▶ What is biodiversity? Why is it important to life on Earth?

The captain will appoint group members to collect the required materials while the rest of the group reviews today's procedure. Before beginning, the captain will make sure that the group has all required materials, and that everyone knows the day's procedure.

The note taker will take notes on the group's findings for your team. Remember to record your observations and explanations in your journal for your own research notes. Include drawings to illustrate your findings.



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MATERIALS

- ▶ journals
- ▶ activity sheets
- ▶ one page of the White Pages of an old phone book

NOTE: Don't forget to recycle the phone book when you're done!

PROCEDURE

1. Scientists use a biodiversity index to calculate how biodiverse a particular area is. The index lets them see biodiversity in terms of a measurable number. The number of species in an area is determined by observation. This number, divided by the total number of all the individuals in that area, is the biodiversity index. Use the pages of a phone book to see how this is done.
2. Imagine that each surname on the phone book page represents one species. Follow the directions on the activity sheet to calculate the biodiversity index for your area of the "species" found on one page of the White Pages.



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GROUP WORKSHEET 1
TEAM

GROUP MEMBERS _____

CAPTAIN _____ NOTE TAKER _____

1. Before you begin, establish your hypothesis. Imagine that each surname on your page of the White Pages represents a species of living thing, how biodiverse do you think your area will be?

2. Examine your page of the White Pages. Count the number of surnames on the page. Record that number in the space below.

▶ Number of surnames or species on the page: _____

3. Calculate the biodiversity index of your page. Consider the examples below:

▶ One page contains 300 names and they are all the same name, Morgan. Use this formula to calculate the diversity of names on the page:

$$\frac{1 \text{ surname/species (numerator)}}{300 \text{ individuals (denominator)}} = \frac{1}{300} = 0.003 \text{ (index of diversity)}$$

This is a very low index.

▶ Another page of 300 names lists 200 Morgans, 60 Morales, 32 McMahans, and 8 Mwebetes. Here the index would be:

$$\frac{4 \text{ surnames/species (numerator)}}{300 \text{ individuals (denominator)}} = \frac{4}{300} = 0.013 \text{ (index of diversity)}$$

**This is a higher index than the first example;
it represents greater diversity.**

It is also useful to look at the contribution of each species to the total number of species. Here Morgans represent 200/300, or 2/3 of the group; Morales represent 60/300 or 1/5 of the group, and so on.

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GROUP WORKSHEET 2
TEAM _____

3. Use your page of the White Pages to calculate the biodiversity index for the page, and the relative contribution of some of the names/species to the total number of species.

NAME	RELATIVE CONTRIBUTION TO THE TOTAL # OF NAMES/SPECIES

4. Apply your study to the field. How could you calculate the biodiversity index for an actual geographic area? What would you need to know and how could you acquire that data?

ACTIVITY | Calculating a Biodiversity IndexGROUP WORKSHEET 3
TEAM _____

5. Which area would have a higher biodiversity index, a rainforest or a cornfield? A cornfield or a front yard? Why?

6. Which area would be most at risk if the environment changed? Why?

GROUP DYNAMICS

Comment on the way your group worked together.

