

Unit 12

Biodiversity

Description

By combining mathematical models and field experiments, scientists hope to learn how ecosystems function and how environmental changes might affect biodiversity. In one study, a more diverse system was better able to withstand stress such as drought than a less diverse system. With current extinction rates rivaling those of previous episodes of mass extinction, such knowledge may help in efforts to minimize the problems associated with a loss of biodiversity.

Menu of Unit Activities

Note: All activities, handouts, solutions, and tips can be found in the Appendix of this guide.

Activity 1: Before and After (15 minutes + 30 minutes of video)

Six discussion questions that outline biodiversity issues covered in the video.

Activity 2: Quantifying Biodiversity (45 minutes)

Explanation and exercises in generating and comparing biodiversity indices. Indices are made for a representative community that undergoes habitat fragmentation.

Activity 3: Extinction Risk (25 minutes)

A discussion on factors that increase the risk of extinction. Two examples of species with various factors are provided for context and comparison.

Activity 4: Concept Maps (20 minutes)

Four lists of concepts for making concept maps, with discussion questions.

Activity 5: Wrap-Up Discussion (15 minutes)

Questions that explore ethical issues in preserving biodiversity and practical issues in teaching the concepts of the field.

Before the Session

Facilitator: Copy and assemble the following activity materials. (See the Activities section in the Appendix of this guide for master copies of transparencies and handouts, plus Tips and Suggested Answers.)

Activity 1: Before and After requires:

- One copy of the list of Biodiversity Questions per person (master copy provided)

Activity 2: Quantifying Biodiversity requires:

- One copy of the Worksheet for Quantifying Biodiversity with Diversity Indices plus Discussion Questions per person (master copy provided)
- Approximately 125 small, colored objects to represent individuals in an ecosystem. For every two people, have five small items (e.g., strips of paper, toothpicks, matchsticks, colored candies, etc.) in each of five different colors (five red, five green, five white, etc.), for a total of 25 per two people.
- Tips and Suggested Answers

Activity 3: Extinction Risk requires:

- One copy of the Pairs of Species To Compare for Extinction Susceptibility plus Discussion Questions per person (master copy provided)
- One copy of the Biodiversity online text chapter per two people (available online at <http://www.learner.org/channel/courses/biology>)
- Tips and Suggested Answers

Activity 4: Concept Maps requires:

- One copy of the list of Suggested Concepts To Map per person (master copy provided)
- One copy of the Biodiversity online text chapter per two people (available online at <http://www.learner.org/channel/courses/biology>)

Activity 5: Wrap-Up Discussion requires:

- One copy of the Discussion Questions per person (master copy provided)

Facilitator: Make sure that the room has these supplies:

- pens or pencils and paper
- overhead projector and markers
- VCR and TV
- black/white board with chalk or markers

Session Activities and Video

Activity 1a: Before and After—Pre-Video Discussion (10 minutes)

- Read the Setup.
- Arrange into pairs.
- Have each person take a copy of the Biodiversity Questions to discuss.
- Discuss the list of questions.

Video (30 minutes)

- Watch the Biodiversity video.

Activity 1b: Before and After—Post-Video Discussion (5 minutes)

- Go over the biodiversity issues as a group and see if anyone would change or amend their answers, and if everyone's questions were answered.

Activity 2: Quantifying Biodiversity (45 minutes)

- Read the Setup.
- Arrange into pairs and have each pair take a Worksheet.
- After reading the background, do Exercise 1 in pairs.
- If necessary, the facilitator can check answers with the Tips and Suggested Answers section.
- While the pairs are finishing Exercise 1, the facilitator can distribute the objects that represent individuals of different species.
- As a group, build the ecosystem for Exercise 2 by having each pair contribute their objects.
- Do Exercise 2.
- Discuss the questions as a group.

Session Activities and Video, cont'd.

Activity 3: Extinction Risk (25 minutes)

- Read the Setup.
- Arrange into teams with three or four people per team.
- Have each person take a handout of the Pairs of Species To Compare for Extinction Susceptibility plus Discussion Questions.
- Pass out a copy of the Biodiversity online text to each team.
- Do Activity 3, consulting the text and the Tips and Suggested Answers.

Activity 4: Concept Maps (20 minutes)

- Read the Setup.
- Have each person take a copy of the Suggested Concepts To Map and draw a concept map that includes all of them.
- The facilitator should encourage the addition of concepts or new lists of concepts to map.
- Have copies of the online text available for reference.
- When everyone is finished, arrange groups of three or four to compare concept maps and discuss the questions associated with each.

Activity 5: Wrap-Up Discussion (15 minutes)

- Read the Setup.
- Have each person take a copy of the Discussion Questions.
- Discuss the questions as a group.

Summary (5 minutes)

- If time permits, as a group or in pairs, define the major ideas or “take home” lessons of this unit and its applications.