

BIODIVERSITY

1. Define biodiversity

2. Put the words of the definition of biodiversity in correct order

Biological / organisms / among / living / which / ecological / variety / and / variability / and / they / complexes / is / the / diversity / the / in / occur

3. Complete the text with the suitable terms.

A pond ecosystem may consist of a pond _____ (*A place where plants, animals and micro-organisms live.*), inhabited by _____ (*Members of a single species living in a habitat.*) of aquatic plants, waterside plants, micro-organisms. The organisms together make up a _____ (*A group of people, animals and and/or plants that live together in one place*) of living things.

http://www.bbc.co.uk/schools/gcsebitesize/science/ocr_gateway/environment/0_ecology_organisms1.shtml

4. Biodiversity can be divided into three hierarchical categories. What are they? Label the descriptions. Then describe each type in your own words.

- _____ **diversity** refers to the **variation of genes within species**. This covers distinct populations of the same species (such as the thousands of traditional rice **varieties** in India) or **genetic variation** within a **population** (high among Indian rhinos, and very low among cheetahs)...
- _____ **diversity** refers to the variety of species **within a region**. Such **diversity can be measured** in many ways, and scientists have not **settled on** a single best method. The number of species in a region -- its **species "richness"** -- is one often- used measure, but a more precise **measurement**, "**taxonomic diversity**", also considers the **relationship of species to each other**. For example, an island with two species of birds and one species of lizard has a greater taxonomic diversity than an island with three species of birds but no lizards...
- _____ **diversity** is harder to measure than species or genetic diversity because the "boundaries" of communities -- associations of species -- and **ecosystems** are elusive. Nevertheless, as long as a consistent **set of criteria** is used to define communities and ecosystems, their **numbers** and **distribution can be measured**..."

Adapted from: World Resources Institute, World Conservation Union, and United Nations Environment Programme, "Global Biodiversity Strategy," 1992:

5. Listen and check your answers

<https://www.youtube.com/watch?v=0-PE3ve3w2w> (Biodiversity – Bozeman Science: 2:15-2:36), Accessed April 8, 2016

6. What is a keystone species?

7. Complete the paragraph with parts A-E

Keystone species, in ecology, a species Such species help to maintain local biodiversity within a community either by controlling populations of other species or by providing critical resources for a wide range of species.

The name *keystone species*,, was derived from the practice of using a wedge-shaped stone to support the top of an arch in a bridge Just as other stones in the construction depend on the keystone for support, other species in a biological community to maintain the community's structure.

- A. that would otherwise dominate the community
- B. or other construction
- C. depend on the presence of a keystone species
- D. that has a disproportionately large effect on the communities in which it occurs
- E. coined by American zoologist Robert T. Paine in 1969

8. Listen to the recording about a sea otter and take notes.

<http://www.britannica.com/science/keystone-species> (Keystone species) Accessed April 8, 2016

sea otter – mořská vydra
kelp – čepelatka (druh chaluhy)
sea urchin – mořský ježek

shellfish – korýš
in check – under control

9. What are the major causes of biodiversity loss?

<https://www.youtube.com/watch?v=vCkDxD0DV0Q&nohtml5=False> (Loss of biodiversity) Accessed April 8, 2016

10. Biodiversity under Attack

Underline the key words in the main ideas of the passage in question. Then list as many synonyms and/or antonyms as possible.

- A. This paragraph gives an example of a tropical plant that is of great medicinal value to humans and another plant of potential value that is threatened by extinction.
- B. Economic development is necessary if the loss of the world's biodiversity is to be halted.
- C. The rapid loss of tropical species can be slowed if we address all its causes.
- D. To preserve tropical biodiversity, we also need to speed up research into the species that have not yet been studied.
- E. Tropical forests are rapidly being destroyed by humans.
- F. The wild species of the tropical forests are an underused and very valuable source of crop plants for humans.
- G. The destruction of tropical forests is causing the rapid extinction of the natural species that are native there.
- H. Conservation is a necessary component of a solution to the biodiversity crisis.
- I. The loss of species diversity is immensely significant because it also means a permanent loss of genetic resources.
- J. More than half of all the world's natural species have their home in the earth's tropical forests.

Identify the paragraphs by scanning the text. Write the correct paragraph number beside its main idea.

Scanning technique:

1. decide what information is needed
2. draw up a list of possible key words (including synonyms) which may occur in the text referring to question topic
3. scan for instances of key words
4. read carefully those sentences and/or paragraphs where the keywords occur and decide if the information is relevant
5. repeat steps 3) and 4) until all relevant information is available

Biological Diversity under Attack

1. To date, biologists have described fewer than 1 million of the earth's natural species. There is no certainty about how many species exist, although scientific estimates range from a conservative 3 million to 30 million. However, despite disagreement about the total number of species, there is general consensus among scientists that at least half of the world's species live in the rain forests of the earth's tropical regions. To appreciate the immense biodiversity in these forests, consider the following figures: There are approximately thirty-two native species of trees in the United Kingdom today. However, in each of two small plots of rain forest in Peru (roughly one-millionth the area of the United Kingdom), a U.S. researcher identified approximately three hundred tree species.
2. For some years, however, the moist forests of the earth's tropical regions have been the scene of massive destruction as humans cut down or burn the trees to provide hardwood or land for agriculture and settlement. By 1990, for example, the total deforestation in Brazil's Amazon region amounted to 41.5 million hectares, the equivalent of an area as large as Sweden. Elsewhere in the 1980s, Malaysia destroyed an estimated 2.7 million hectares of its tropical forests at an annual rate of 1.3 percent. During the same decade, Indonesia lost 10 million hectares of rain forests an area larger than Portugal or the state of Indiana. Today the tropical rain forests of Southeast Asia and South America continue to retreat at a rate in excess of ninety thousand square kilometers a year.
3. For tropical species, such massive deforestation means equally massive habitat destruction, which in turn is causing the extinction of species on a scale unprecedented in human history. A 1989 study, which assumed a conservative total of 2 million species living exclusively in the tropical rain forests, estimated that between four thousand and six thousand species a year are currently being driven to extinction. Even these conservative estimates, the study points out, represent a rate of extinction approximately ten thousand times greater than the extinction rate that existed prior to the appearance of humans on the earth. Other studies suggest that the extinction rate could rise to between seven thousand and twenty-seven thousand species a year.
4. For a number of reasons, the threatened species of the rain forests are an immense and irreplaceable resource. First, because of their genetic diversity, they are a source of genetic material that can be utilized to support or replace domesticated varieties that become susceptible to pests or disease. For example, the wild American oil palm has a natural resistance to spear rot, a disease that is destroying the domesticated African oil palm. Researchers are using genes from the American plant to develop resistance to the disease in its African cousin.

5. Second, tropical species are a potentially vast source of tree and plant species that could be domesticated for human use. Twenty-four crop species have been domesticated in the Amazon region alone, and countless numbers remain. *Caryocar villosum* is a tree that produces fruit valued highly by Amazonian peoples. The *Copaifera* tree species produce substances that can substitute for diesel fuel.
6. As a potential source of medicinal drugs, tropical species are irreplaceable. Wilson cites the example of *Catharanthus roseus*, a small plant native to Madagascar. It produces two substances, vinblastine and vincristine, which are extremely effective in the treatment of two forms of cancer. The income from these two substances exceeds \$100 million a year. None of the five other species of *Catharanthus* has been carefully studied. One of the five is close to extinction because its habitat is threatened by deforestation.
7. What can be done to preserve the biological diversity of the tropical rain forests, with its wealth of scientific information and its unrealized potential as a source of material benefits? The prospects are poor that the extinctions can be completely halted.¹⁵ However, many experts are cautiously optimistic that today's rate of extinction can be slowed if we address both the immediate and the root causes of the crisis.
8. Establishing forest reserves-areas where all economic exploitation of the forest is forbidden – will protect tropical species by preserving their habitats. Conservation measures such as these are necessary in the fight against deforestation, the immediate cause of biodiversity loss; by themselves, however, they are insufficient responses to the problem.
9. A second essential step is to address the root cause of the problem-the economic pressures that cause people to destroy the forests for short-term gain. Accomplishing this, however, will be a major challenge for the international community because it will involve tackling the complex and related problems of poverty, overpopulation, and unsustainable development.
10. At the same time, we need to accelerate the pace of scientific research into the species of the tropical rain forests. Such research is our only means of identifying areas that should be given priority in conservation decisions. It will also provide necessary information about the value of as yet unstudied species. This information will help reduce human ignorance about our dependence on the natural world and will clearly be needed if we are eventually to convince people that the biological resources of the rain forests are worth preserving.

Source: Pakenham, J. Making Connections, CUP, 1998