

Diagonostic Worksheet Instructions

This diagnostic worksheet is not meant to be graded, except for the fact that the student handed it in.

I am measuring the student's knowledge of basic ecological concepts, each of which should be covered in 9th grade Living Environment.

Below are answers that would illustrate mastery of these concepts as they are detailed in LE.

1. What is a biological population?

An interbreeding group of individuals of one species.

Or

A group of individuals of the same species in the same place

*The key ideas here are **a population is a group of organisms of the same species that interbreed** and/or live in the same place. Technically the interbreeding part is correct, but the "same place" idea is often taught as a simpler alternative in 9th grade.*

2. Give your best definition of what a species is.

*A species is hard to adequately define even for professional scientists. For our purposes, we will be using the **biological species concept**:*

"species are groups of interbreeding natural populations that are reproductively isolated from other such groups."

Basically, a species is a group of animals that can have babies with each other.

Many students will likely have trouble with this one. There is a species concept lesson later in the course.

3. What is a vertebrate? Give some examples.

An animal with a backbone. Mammals, birds, amphibians, reptiles, bony fish, cartilaginous fish.

4. Name and explain a few factors might affect whether a population increases or decreases in size?

Here students will hopefully think of general examples like an increase in death, and increase in births, an influx of immigrants, but more likely they will say specific things such as disease, humans killing a lot of them, finding a new food source. Any of those are good news.

5. What is a community?

A community is the assemblage of species living in an area

More likely...

All the living things in a place.

The second one is perfectly fine.

6. Can you give an example of how two species might interact?

I am hoping that some of the students remember concepts like competition, mutualism, predation, etc. but would be happy if they follow the question and give me specific examples like a lion eating a gazelle, or a remora eating rotting food bits off a shark, or a bird nesting in a tree.

7. Describe the concepts of the independent variable and the dependant variable in an experiment.

The independent variable is the variable that is changed by the experimenter, so see what happens to the dependant variable. The dependant variable therefore is what the experimenter is interested in measuring.

8. This question is more of an essay. Please write a few paragraphs about the following concepts:

- Define the word “natural.” What does it mean to you?
- What is “Nature?” Where do you find nature? Are people a part of the natural world?
- What does it mean when something is “wild?”
- Should humans manipulate or change the environment to help themselves? Should beavers?
- Why do you think I asked you about humans altering their environment and then about beavers?

The purpose of this longer essay is to make the students think of their concept of nature and how humans and the human-modified places of the world fit into that idea. Do they consider the city “natural”? Are wild animals “supposed” to live in a city?

The human/beaver question is to direct them to think about why we often consider human behaviors, particularly modifications to their environment, “unnatural” and perhaps “bad” while other species similar behaviors (e.g., beavers building dams and changing a forest into a pond) “natural” and perhaps “good”. Is there truly a qualitative difference?

We will revisit these answers at the end of the course.

