SI Environmental Science - Full Discipline Demo

Biomes, Ecosystems, and Habitats

Final Report - Answer Guide

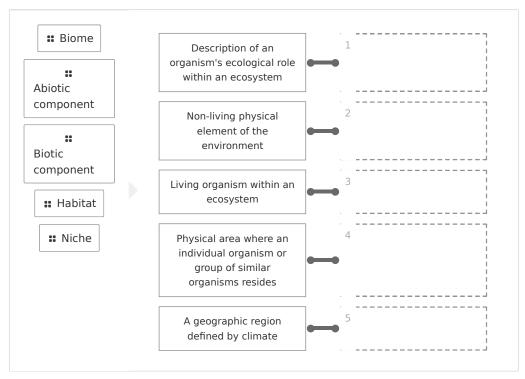
Institution Science Interactive University

SessionSI Environmental Science - Full Discipline DemoCourseSI Environmental Science - Full Discipline Demo

Instructor Sales SI Demo

Test Your Knowledge

Match each term with the best description.

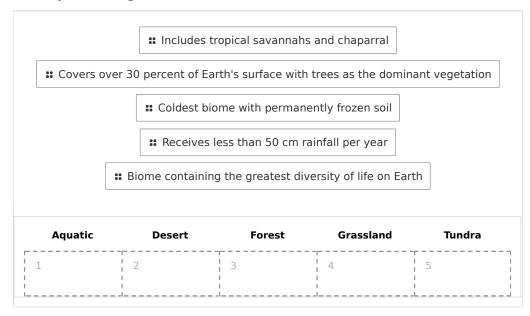


Correct answers:

- 1 Niche 2 Abiotic component 3 Biotic component 4 Habitat
- 5 Biome



Identify a defining characteristic of each biome.



Correct answers:

- 1 Biome containing the greatest diversity of life on Earth
- 2 Receives less than 50 cm rainfall per year

3

Covers over 30 percent of Earth's surface with trees as the dominant vegetation

- 4 Includes tropical savannahs and chaparral
- 5 Coldest biome with permanently frozen soil

Exploration

| T | he | biome includes rivers, estuaries, and coral reefs. |
|---|----|--|
| | | aquatic |
| | | desert |
| | | tundra |
| | | forest |



| Biotic components of an ecosystem include | |
|--|-----|
| temperature | |
| plants | |
| soil chemistry | |
| sunlight | |
| Two species may share the same niche within an ecosystem. True | |
| ○ False ✓ | |
| Exercise $f 1$ Would you consider the two environments you investigated to be different ecosystems? Explain your answer by referencing the definition of an ecosystem and your results in Data Tables 1 and 2. | ta |
| | |
| | |
| Students were required to identify two distinctly different environments and use as study areas, they should conclude that the areas were different ecosystems as evidenced by the different physical characteristics recorded in Data Table 1 and different arrays of species recorded in Data Table 3. Students should also provide a definition for ecosystem: a defined area including the interactions between all biotic and abiotic components. | |
| | |
| Which abiotic factors differed between study areas? Reference your data and photos in your same. | our |
| | |
| | |
| Students answers will vary based on study areas but should only include abiotic factors such as temperature, soil pH, sun exposure, topography, and weather differences. Students should support their answers by referencing the data tables and photo panels. | |



| as n in |
|---------------------------|
| ch the ion of |
| |
| areas ources of |
| he data an |
| a areas e abitat |
| |

Panel 1: Predicted Differences Between Locations (SAMPLE ANSWER BELOW)

Note to instructors: Students will select two differing locations to observe and count plants and animals. Predictions will differ based on locations, but students should have sound reasoning behind predictions. For example, a student should predict that a wetland site would have water dependent plants and animals compared to an exposed hillside location, or that forested locations would result in plants consisting of tall trees and ground plants adapted to low light along with



squirrels and birds of the canopy; compared to a meadow that would be occupied by grasses, flowers, butterflies, and ground dwelling animals.

Panel 2: Area 1 Location and Description

(SAMPLE ANSWER BELOW)

Students responses will vary based on the study area selected but should contain the name, county, and state of the location along with a brief description, such as natural meadow or dense forest.

Photo 1: Study Area 1 Entire Site

(SAMPLE ANSWER BELOW)

Note to instructors: The response should consist of a photograph of the study location described in Panel 2.



Photo 2: Quadrat 1 (SAMPLE ANSWER BELOW)

Note to instructors: Student responses should include a photo of their 1.0 m² quadrat from study area 1 showing the plant species it contains.

Data Table 1: Characteristics of Study Areas (SAMPLE ANSWER BELOW)

Parameter Study Area 1 Study Area 2

Date and Time Student answers will vary based on site selection

Temperature (°C)

Number of Trees within 20 m

Number of Bush and

Data Table 2: Animals and Plants Observed (SAMPLE ANSWER BELOW)

Shrub-like Plants within 20 m Percent Sun Exposure Soil pH

| (SAMILE ANSWER BELOW) | | | |
|--|-------------|-------------------|-------------|
| Study Area 1 Organism Name/Type | Number of | Study Area | Number of |
| | Individuals | 2 Organism | Individuals |
| | Counted | Name/Type | Counted |
| Ex: Squirrel | 3 | Ex: Dandelions | 75 |
| Students should report the living organisms (plants and animals) observed at this study area. The approximate number of individuals should be recorded when possible. Students should record observations for a total of 20 minutes. Student answers will vary based on the sampling site. | No sample | No sample | No sample |
| | answer | answer | answer |
| No sample answer | No sample | No sample | No sample |
| | answer | answer | answer |
| No sample answer | No sample | No sample | No sample |
| | answer | answer | answer |
| No sample answer | No sample | No sample | No sample |
| | answer | answer | answer |
| No sample answer | No sample | No sample | No sample |
| | answer | answer | answer |
| No sample answer | No sample | No sample | No sample |
| | answer | answer | answer |
| No sample answer | No sample | No sample | No sample |
| | answer | answer | answer |
| No sample answer | No sample | No sample | No sample |
| | answer | answer | answer |
| No sample answer | No sample | No sample | No sample |
| | answer | answer | answer |
| | | | |



| No sample answer | No sample answer | No sample answer | No sample answer |
|------------------|---------------------|---------------------|---------------------|
| No sample answer | No sample answer | No sample answer | No sample answer |
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| No sample answer | No sample answer | No sample answer | No sample answer |
| No sample answer | No sample answer | No sample answer | No sample answer |

Panel 3: Area 2 Location and Description (SAMPLE ANSWER BELOW)

Students responses will vary based on the study area selected but should contain the name, county, and state of the location along with a brief description, such as natural meadow or dense forest.

Photo 3: Study Area 2 Entire Site (SAMPLE ANSWER BELOW)

Note to instructors: The response should consist of a photograph of the study location described in Panel 3.



Photo 4: Quadrat 2 (SAMPLE ANSWER BELOW)

Note to instructors: Student responses should include a photo of their 1.0 $\rm m^2$ quadrat from study area 2 showing the plant species it contains.



Competency Review — are geographic regions defined by climate. Biomes Ecosystems Habitats Niches



| The eastern third of the onited States is composed of the blome. | |
|--|----------|
| ○ chaparral | |
| temperate grassland | |
| temperate broadleaf forest | ~ |
| onorthern coniferous forest | |
| A(n) includes all the biotic and abiotic components of a defined are and their interactions. | ea |
| biome | |
| ecosystem | ✓ |
| habitat | |
| niche | |
| A habitat includes all required resources for an organism. True False | ~ |
| Abiotic components determine which organisms live in an ecosystem. | |
| □ True | ~ |
| ○ False | • |
| - False | |
| should be recorded for a 1 m ² quadrat when comparing ecosystem | s. |
| Plant numbers | |
| ○ Soil pH | |
| Sun exposure | |
| All of the above | ~ |
| | |



| - | |
|---|----------|
| O True | |
| ○ False | ✓ |
| | |
| A field study site with acidic soil, cool summer temperatures, and a predominance of needle-leafed trees would be representative of the | |
| biome. | |
| biome. tropical forest | |
| | |
| tropical forest | |
| tropical forestdesert | ~ |

Two observation areas with differing abiotic components provide similar

Extension Questions

Anthropogenic biomes and ecosystems result from human settlements, agriculture, and animal husbandry practices. One example is cropland ecosystems consisting of hundreds of acres of a single plant species. Apply your knowledge of natural biomes and ecosystem sampling to predict how habitat diversity and biotic interactions in a cropland ecosystem would compare to a natural ecosystem in a nearby area. (SAMPLE ANSWER BELOW)

The cropland ecosystem should have lower habitat diversity than a natural ecosystem since all the plants are the same species. This would result in the same food and shelter resource being available to all organisms in the ecosystem. Because the resources are identical within the ecosystem, the numbers of biotic interactions in the area would also be reduced. The entire system would become a uniform habitat compared to natural ecosystems that consist of many habitats and biotic interactions between species.