

SI Environmental Science - Full Discipline Demo

Ecological Succession

Final Report - Answer Guide

Institution	Science Interactive University
Session	SI Environmental Science - Full Discipline Demo
Course	SI Environmental Science - Full Discipline Demo
Instructor	Sales SI Demo

Test Your Knowledge

Match each term with the best description.

⚡ Pioneer species	Relatively stable combination of species within an ecosystem 1
⚡ Secondary succession	Temporary change in environmental conditions 2
⚡ Climax community	Initial colonizer of new habitat 3
⚡ Disturbance	Series of community changes which occur within a new habitat 4
⚡ Primary succession	Series of community changes which take place on a previously colonized habitat 5

Correct answers:

- | | | | | | |
|---|--------------------|---|----------------------|---|-----------------|
| 1 | Climax community | 2 | Disturbance | 3 | Pioneer species |
| 4 | Primary succession | 5 | Secondary succession | | |

Categorize each disturbance as natural or anthropogenic.

	Natural	Anthropogenic
☐ Windstorm	1	2
☐ Agriculture		
☐ Clearcutting		
☐ Earthquake		

Correct answers:

1 Windstorm Earthquake 2 Agriculture Clearcutting

Exploration

Climax communities are considered the final stage of ecological succession.

- ☐ True ✓
- ☐ False

Anthropogenic disturbances include ____.

- ☐ agriculture ✓
- ☐ earthquakes
- ☐ windstorms
- ☐ lava flows

Pioneer species are necessary for secondary succession to occur.

- ☐ True
- ☐ False ✓

Exercise 1

What type of ecological succession was represented in each of the image series in this exercise? Reference your responses in Data Tables 1-2 and the specific photos in each of the series in your explanation.

Primary succession was represented in series 1 as new land was created in the form of sand dunes as shown in photo 1C and as referenced in Data Table 1. Secondary succession was represented in series 2 as disturbance in the form of a fire that destroyed an existing forest ecosystem as shown in photo 2D and as referenced in Data Table 2.

Are climax communities represented in either of the image series in this exercise? Reference the specific photos and Data Tables 1-2 in your explanation.

Yes, a climax community is a relatively stable combination of species considered to be the final stage of ecological succession. Series 1 photo D and series 2 photo A are examples of mature forests as referenced in Data Table 1 and 2.

Which of the two communities represented in this exercise had the potential to undergo succession faster? Reference the importance of soil in your explanation.

Series 2 had the potential to succeed faster because it had soil remaining after the disturbance, whereas series 1 began with only sand. Soil contains both seeds and roots of living plants and nutrients that support rapid establishment and growth of plants after a disturbance compared to primary succession which requires soil to be formed before a diversity of plants can colonize an area.

Data Table 1: Ecological Succession Series 1
(SAMPLE ANSWER BELOW)

Image	Order	Explanation
A	3	Small trees begin colonizing the site
B	2	Numerous grass and herb species present
C	1	Only pioneering grass present.
D	4	Climax forest present

Data Table 2: Ecological Succession Series 2
(SAMPLE ANSWER BELOW)

Image	Order	Explanation
A	4	Climax boreal forest
B	2	Numerous species of non-woody plants have colonized the burn area
C	3	Small trees are thriving
D	1	Emergent vegetation following a forest fire

Data Table 3: Ecological Succession Initiators
(SAMPLE ANSWER BELOW)

Event Description	Primary or Secondary Succession
A volcanic eruption produces a new island in the Pacific Ocean.	Primary Succession
A typhoon levels a coastal forest.	Secondary Succession
A glacier retreats leaving a valley of exposed rock.	Primary Succession
A grassland is plowed to create a cornfield.	Secondary Succession
An introduced species destroys the trees in a community.	Secondary Succession

Exercise 2

Was there evidence of natural or anthropogenic disturbances in the natural area you visited? Reference Photo 1 and the history recorded in Panel 1 in your explanation.

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What stage of ecological succession was present in the area you visited and photographed? Reference Photo 1 and Data Table 4 in your answer.

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Panel 1: Location and History of Natural Area
(SAMPLE ANSWER BELOW)

Note to instructors: Student answers will vary with the location of the study area but should include the county and state of location, and a brief description of the history of the site (if available).

Photo 1: Natural Area

(SAMPLE ANSWER BELOW)

Note to instructors: Student photos will vary but should include a natural area devoid of buildings. The three types of dominant vegetation in the area should be visible in the photo.

Data Table 4: Plants and Animal Types of Area

(SAMPLE ANSWER BELOW)

Abundance	Plant type	Animal type
1	Student answers should match the natural area in Photo 1. Only types (not species) are required here.	
2		
3		

Competency Review

Disturbances may result from both natural events and human causes.

- ☐ True

☐ False
- ✓

A ____ is an example of a climax community.

- ☐ clearcut

☐ lava flow

☐ rain forest

☐ sand dune
- ✓

Secondary succession usually proceeds more slowly than primary succession.

- ☐ True

☐ False
- ✓

____ are examples of pioneer species.

- ☐ Hardwood trees and Barred owls

☐ Mosses and lichens

☐ Shrubs and cottontail rabbits

☐ Wildflowers and grazers
- ✓

The photo below represents the intermediate stages of ecological succession.



- ☐ True ✓
- ☐ False

_____ are initiators of primary succession.

- ☐ Clearcutting and agriculture
- ☐ Forest fires and earthquakes
- ☐ Lava flows and landslides ✓
- ☐ Windstorms and invasive species

A ____ is a location where ecological succession can be observed in the local ecosystem.

- ☒ natural area ✓
- ☐ city playground
- ☐ manicured lawn
- ☐ parking lot

The most numerous plant and animal species of an area should be noted when assessing the progression of ecological succession.

- ☒ True ✓
- ☐ False

Extension Questions

Natural events are associated with both primary and secondary succession, whereas human activities are associated with secondary succession. Provide an example of a human activity that could lead to primary ecological succession. Explain your answer. (SAMPLE ANSWER BELOW)

Any human activity that creates a habitat where no life has previously existed could lead to primary succession. Examples include open pit mining, artificial beach creation, or hillsides created by excavation tailings. The provided example should expose surfaces (habitats) that have never been colonized by plants or animals.