



## **Biodiversity Lesson 2: *The Make***

### **Student Handout**

#### **Directions**

Biodiversity is a measure of the different types of living organisms within an ecosystem. For example, an environment with very few species in the same area would have **low** biodiversity. An environment with many species in the same area would have **high** biodiversity. A healthy and balanced ecosystem should include a wide range of plants, animals, fungi, and microorganisms (*small organisms invisible to the naked eye*).

Humans play a big role in biodiversity. Oftentimes, human activity, such as logging and overfishing, kills off animals in an ecosystem and results in a loss of biodiversity. Reflect back to the Biodiversity Comic Mystery and how the removal of wolves from Yellowstone Park disrupted the biodiversity within the park ecosystem.

Your *Make* task today is to work as Field Biologists to:

1. Explore the biodiversity of your schoolyard by creating a field journal.
2. Create a Schoolyard Biodiversity Chart that shows the connections between organisms in your schoolyard ecosystem.
3. Roll the “Dice of Destiny” to encounter an environmental stressor. Predict how this environmental stressor would impact on the biodiversity within your ecosystem.
4. Create a BEFORE and AFTER poster to show the biodiversity that exists in your schoolyard currently and how an environmental stressor could impact on this biodiversity.




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### Planning Organizer

### Field Journal

Date	Time	Temperature (°F)
Type of Ecosystem (circle one):	Weather Conditions	
Forest Ecosystem Grassland Ecosystem Desert Ecosystem Tundra Ecosystem Freshwater Ecosystem Marine Ecosystem		

<b>Example Species Card</b>		
<b>Circle one:</b> Plant <b>Animal</b> Insect   Fungus   Other		
<b>Sketch/photograph:</b>  	<b>Description:</b>  Squirrel was grayish-brown in color with a white belly. Squirrel has a fluffy tail and claws for climbing the tree.	<b>Location of Species:</b>  Squirrel was observed on the side of a maple tree moving up the tree toward a nest.



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<b>Species #1</b>		
<b>Circle one: Plant Animal Insect Fungus Other</b>		
<b>Sketch/photograph:</b>	<b>Description:</b>	<b>Location of Species:</b>

<b>Species #2</b>		
<b>Circle one: Plant Animal Insect Fungus Other</b>		
<b>Sketch/photograph:</b>	<b>Description:</b>	<b>Location of Species:</b>

<b>Species #3</b>		
<b>Circle one: Plant Animal Insect Fungus Other</b>		
<b>Sketch/photograph:</b>	<b>Description:</b>	<b>Location of Species:</b>



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<b>Species #4</b>		
<b>Circle one: Plant Animal Insect Fungus Other</b>		
<b>Sketch/photograph:</b>	<b>Description:</b>	<b>Location of Species:</b>

<b>Species #5</b>		
<b>Circle one: Plant Animal Insect Fungus Other</b>		
<b>Sketch/photograph:</b>	<b>Description:</b>	<b>Location of Species:</b>





### **Schoolyard Biodiversity**

Brainstorm how organisms in your schoolyard ecosystem are connected to one another. In order to do so, you may:

- List the names of organisms and describe their connections to one another in the space below.

**OR**

- Create an annotated sketch to show how organisms within your schoolyard ecosystem could be related to one another.





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### “Dice of Destiny”

Roll the “Dice of Destiny” to encounter an environmental stressor and circle the stressor on the list below.

Roll #	Environmental Stressor
1	New predator introduced into ecosystem
2	Removal of predator from ecosystem
3	Pollutant in soil
4	Pollutant in water
5	Removal of trees for school addition
6	Paving over schoolyard to create additional parking lot

How could this environmental stressor impact on the biodiversity within your ecosystem?





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### **Biodiversity Before and After Poster: Planning Template**

Construct a full-color BEFORE and AFTER biodiversity poster of your schoolyard ecosystem to present to your peers. Be sure to include the following:

- The current biodiversity and relationships that exist among organisms in your schoolyard ecosystem.
- The biodiversity and relationships that could exist AFTER the environmental stressor impacts on your ecosystem.
- Label each organism within the poster.
- Below the BEFORE side of the poster, describe the relationships that exist among organisms illustrated in the poster.
- Label and illustrate the environmental stressor in the AFTER side of the poster.
- Below the AFTER side of the poster, describe how the environmental stressor could impact on the biodiversity and relationships among organisms in the ecosystem.

BEFORE:

AFTER:

Description:

Description:



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Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Exit Ticket: Connection to the Design

1. What are we studying when we explore the biodiversity of an ecosystem?
2. Explain how species can be connected to one another within an ecosystem.
3. Give three examples of how humans have negatively impacted on the biodiversity of ecosystems.
4. How can the removal or death of one species impact the biodiversity in an ecosystem?
5. Why is it important to maintain biodiversity on our planet?





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### **The Make Assessment**

Use the Checklist and Science & Engineering Practices Rubric to ensure you have addressed all aspects of *The Make* with quality work.

### Biodiversity *The Make* Checklist: Content Concepts and Practices

- Field Journal
  - Environmental factors (date, temperature, time, weather, ecosystem type) are recorded
  - 5 species identified within nature walk
  - Sketch completed for each species
  - Description completed for each species
  - Location completed for each species
- Schoolyard Biodiversity Charts
  - Schoolyard Biodiversity Chart includes organism connections within the ecosystem
  - Dice of Destiny environmental stressor is chosen/circled
  - Impacts of environmental stressor described
- Final BEFORE and AFTER Biodiversity Poster
  - Illustrates current biodiversity and relationships that exist among organisms in schoolyard ecosystem
  - Illustrates biodiversity and relationships that could exist AFTER the environmental stressor impacts the ecosystem
  - Labels included for all organisms in both BEFORE and AFTER parts of the poster
  - Description of relationships that exist among organisms included below the BEFORE part of the poster
  - Environmental stressor labeled and illustrated in the AFTER side of the poster
  - Description of how the environmental stressor could impact the biodiversity and relationships among organisms included below the AFTER side of the poster
  - Poster design is well-organized, neat, and in color



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### Science & Engineering Practices Assessed

	<b>Emerging (1)</b>	<b>Developing (2)</b>	<b>Proficient (3)</b>	<b>Advanced (4)</b>
<b>Developing and Using Models</b>	Drawings, diagrams, or visual models include major misconceptions or have missing parts. Explanation of the model is minimal or not present.	Drawings, diagrams, or visual models include minor misconceptions or have missing parts. Explanation of the model is minimal.	Drawings, diagrams, or visual models are complete, but contain a minor misconception. Explanation of the model is complete but lacking complexity.	Drawings, diagrams, or visual models have no misconceptions and contain all details. Explanation of the model is complete and complex.
<b>Constructing Explanations or Arguments From Evidence</b>	Constructs an explanation with no clear sources of evidence.	Uses scientific principles and/or data from at least one source to construct or evaluate an explanation, but explanation contains minor misconceptions.	Uses accurate but incomplete scientific principles and/or data from multiple sources to construct or evaluate an explanation.	Uses accurate and complete scientific principles and/or data from multiple sources to construct or evaluate an explanation.
<b>Communicating Findings/Design (Oral Presentation)</b>	Findings/design are incompletely and inaccurately communicated. Or no evidence of using appropriate eye contact, adequate volume, or clear pronunciation.	Findings/design are completely communicated with some misconceptions. Or uses minimal eye contact, inappropriate volume, or inconsistent pronunciation.	Findings/design are completely communicated but lacking depth and complexity. Or often uses eye contact and engaging and appropriate volume and pronunciation, but is inconsistent.	Findings/design are completely communicated with depth and complexity. Or mostly uses eye contact and engaging and appropriate volume and pronunciation.