

ORANGE PUBLIC SCHOOLS



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BIOLOGY	GRADE: H.S.	UNIT #: 2

SCOPE AND SEQUENCE UNIT 1

Lesson	Interdependent Relationships in Ecosystems	PE's and DCI's	Suggested Pacing Year (Blocks)
1	• Habitat and Niche	HS-LS2-8	1
2	• Community and Interactions	HS-LS2-8	1
3	• Population Density and Distribution	HS-LS2-1, LS2-2	2
4	• Population Growth Patterns	HS-LS2-1, LS2-2	2
5	• Ecological Succession	HS-LS2-6	1
7	• Climate	HS-LS2-6	1
8	• Biomes and Aquatic Ecosystems	HS-LS2-6	2
9	• Human Population Growth and Natural resources	HS-LS2-7	2
10	• Air and Water Quality	HS-LS2-7	3
11	• Threats to Biodiversity	HS-LS4-6	3
12	• Conservation	HS-LS2-7	3

ORANGE PUBLIC SCHOOLS		
BIOLOGY	GRADE: H.S.	UNIT #: 2

November-December				
Mon	Tue	Wed	Thu	Fri
14 Habitat and Niche	15 Habitat and Niche	16 Community and Interactions	17 Community and Interactions	18 Population Density and Distribution
21 Population Density and Distribution	22 Population Density and Distribution	23 Population Density and Distribution	24 Thanksgiving Recess	25 Thanksgiving Recess
28 Population Growth Patterns	29 Population Growth Patterns	30 Population Growth Patterns		

Mon	Tue	Wed	Thu	Fri
			1 Population Growth Patterns	2 Ecological Succession
5 Ecological Succession	6 Climate	7 Climate	8 Biomes and Aquatic Ecosystems	9 Biomes and Aquatic Ecosystems
12 Biomes and Aquatic Ecosystems	13 Biomes and Aquatic Ecosystems	14 Human Population Growth and Natural resources	15 Human Population Growth and Natural resources	16 Human Population Growth and Natural resources
19 Human Population Growth and Natural resources	20 Air and Water Quality	21 Air and Water Quality	22 Air and Water Quality	23 Air and Water Quality

ORANGE PUBLIC SCHOOLS

BIOLOGY

GRADE: H.S.

UNIT #: 2

January 2107

Mon	Tue	Wed	Thu	Fri
2	3 Air and Water Quality	4 Air and Water Quality	5	6 Threats to Biodiversity
9 Threats to Biodiversity	10 Threats to Biodiversity	11 Threats to Biodiversity	12 Threats to Biodiversity	13 Threats to Biodiversity
16 Dr. MLK Jr. Observed	17 Conservation	18 Conservation	19 Conservation	20 Conservation
23 Conservation	24 Conservation	25 PD	26 PD	27

UNIT DESCRIPTION

How and why do organisms interact with their environment and what are the effects of these interactions?

How do organisms interact with the living and nonliving environments to obtain matter and energy?

What happens to ecosystems when environments change?

How do organisms interact in groups so as to benefit individuals?

The performance expectations in LS2: **Ecosystems: Interactions, Energy, and Dynamics** help students formulate an answer to the question, “How and why do organisms interact with their environment, and what are the effects of these interactions?” The LS2 Disciplinary Core Idea includes four sub-ideas: Interdependent Relationships in Ecosystems, Cycles of Matter and Energy Transfer in Ecosystems, Ecosystem Dynamics, Functioning, and Resilience, and Social Interactions and Group Behavior. High school students can use mathematical reasoning to demonstrate understanding of fundamental concepts of carrying capacity, factors affecting biodiversity and populations, and the cycling of matter and flow of energy among organisms in an ecosystem. These mathematical models provide support of students’ conceptual understanding of systems and their ability to develop design solutions for reducing the impact of human activities on the environment and maintaining biodiversity. Crosscutting concepts of systems and system models play a central role in students’ understanding of science and engineering practices and core ideas of ecosystems.

ORANGE PUBLIC SCHOOLS

BIOLOGY

GRADE: H.S.

UNIT #: 2

# Blocks	STUDENT LEARNING OBJECTIVES	CORRESPONDING DCIs	DISCOVERY EDUCATION RESOURCES	ASSESSMENT
	a. Determine the relationship among given organisms. b. Give examples of abiotic and biotic factors and how they may impact an ecosystem. c. Define the major roles of organisms in an ecosystem: • Producer, consumer (primary and secondary), decomposer • Omnivore, herbivore, carnivore. • Characterize several biomes by comparing abiotic and biotic factors (deciduous forest, desert, grassland, savanna, taiga, tropical rainforest, and tundra).	HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.	Discovery Education Model Lessons 5E Model Engage Explore	Assessment 1: Unit Pre-Assessment Assessment 2 Constructed responses (Discovery Education) Assessment 3: Evaluate

ORANGE PUBLIC SCHOOLS

BIOLOGY

GRADE: H.S.

UNIT #: 2

# Blocks	STUDENT LEARNING OBJECTIVES	CORRESPONDING DCIs	DISCOVERY EDUCATION RESOURCES	ASSESSMENT
	a. Classify and organize organisms within the biosphere into communities and populations. b. Analyze ecosystems to determine factors that contribute to stability. c. Explain how an ecosystem returns to a state of stability after a catastrophic disaster: • Primary succession • Secondary succession. a. Predict the effect of naturally occurring environmental events on ecosystems. b. Discuss the impact of natural changes and human activity on given ecosystems. c. Propose solutions for the negative consequences of natural changes and human activity on given ecosystems (i.e., pollution by nitrates)	HS-LS2-2 Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. HS-LS2-6 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	Discovery Education Model Lessons 5E Model Explain Elaborate	Assessment 1 Constructed responses (Discovery Education) Assessment 2 Hands on Labs Assessment 3 Lab Human Impact on Ecosystems

# Blocks	STUDENT LEARNING OBJECTIVES	CORRESPONDING DCIs	DISCOVERY EDUCATION	ASSESSMENT
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ORANGE PUBLIC SCHOOLS

BIOLOGY

GRADE: H.S.

UNIT #: 2

			RESOURCES	
	a. Design and construct a graphical representation of population change due to either environmental changes or human impact. b. Assess the impact of human activities on the population as well as the carrying capacity of different species in an ecosystem.	HS-LS2-8 Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.	Activity 3: https://tools.discoveryeducation.com/assignment/viewAssignment.cfm?guidAssetId=44f8207e-370f-448e-b2a1-cc8e6c928317&&blnPopUp=1&strEditCopy=Copy&blnPlayer=1	Assessment 1: Constructed response Assessment 2: Quiz Assessment 3: Concept based Unit Assessment (DE and textbook Evaluate)

Modifications

ORANGE PUBLIC SCHOOLS

BIOLOGY

GRADE: H.S.

UNIT #: 2

(Note: Teachers identify the modifications that they will use in the unit. See NGSS Appendix D: [All Standards, All Students/Case Studies](#) for vignettes and explanations of the modifications.)

- Structure lessons around questions that are authentic, relate to students' interests, social/family background and knowledge of their community.
- Provide students with multiple choices for how they can represent their understandings (e.g. multisensory techniques-auditory/visual aids; pictures, illustrations, graphs, charts, data tables, multimedia, modeling).
- Provide opportunities for students to connect with people of similar backgrounds (e.g. conversations via digital tool such as SKYPE, experts from the community helping with a project, journal articles, and biographies).
- Provide multiple grouping opportunities for students to share their ideas and to encourage work among various backgrounds and cultures (e.g. multiple representation and multimodal experiences).
- Engage students with a variety of Science and Engineering practices to provide students with multiple entry points and multiple ways to demonstrate their understandings.
- Use project-based science learning to connect science with observable phenomena.
- Structure the learning around explaining or solving a social or community-based issue.
- Provide ELL students with multiple literacy strategies.
- Collaborate with after-school programs or clubs to extend learning opportunities.
- Restructure lesson using UDL principals (http://www.cast.org/our-work/about-udl.html# VXmoXcfD_UA).

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