EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

GRADE 7

EPSD Unit 7: Interdependent Relationships in the Ecosystem (part II)
Fourth Marking Period

<table>
<tr><td rowspan="4">Overview: Students build on their understandings of the transfer of matter and energy as they study patterns of interactions among organisms within an ecosystem. They consider biotic and abiotic factors in an ecosystem and the effects these factors have on a population. They construct explanations for the interactions in ecosystems and the scientific, economic, political, and social justifications used in making decisions about maintaining biodiversity in ecosystems. The crosscutting concept of stability and change provide a framework for understanding the disciplinary core ideas.

This unit includes a two-stage engineering design process. Students first evaluate different engineering ideas that have been proposed using a systematic method, such as a tradeoff matrix, to determine which solutions are most promising. They then test different solutions and combine the best ideas into a new solution that may be better than any of the preliminary ideas. Students demonstrate grade appropriate proficiency in asking questions, designing solutions, engaging in argument from evidence, developing and using models, and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas.</td><td colspan="3">Science Dimensions Program Resources Module C</td></tr>
<tr><td colspan="3">Unit 3 Ecosystem Dynamics
Unit Video (aerial video of Great Salt Lake in Utah) Why it Matters p. 128; Unit Starter p. 129; Unit Project p. 129I; Unit Review pp. 191-194, Vocabulary p. 129G Unit Connections p. 120; Unit Performance Task pp. 195-196</td></tr>
<tr><td colspan="3">Standard for all Units: (D) Interactive Multilingual Glossary; (D/P) Unit Pretest; (D) Lesson Quizzes; (D/P) Unit Test

Note: Refer to the Curriculum Alignment Common Language (CACL) Guide to decipher acronyms.</td></tr>
<tr><td>Lesson 1: Biodiversity in Ecosystems pp. 130-147

D/P – WIM Questions p. 128

D/P- CYEI (digital pictures) What factors might have influenced how this ecosystem recovered from such a large and sudden flood? p. 131

P- ENB (prompt) Gather evidence to help explain</td><td>Lesson 2: Changes in Ecosystems pp. 148-165

D/P – WIM Questions p. 128

D/P- CYEI (digital picture) How can a swarm of millions of desert locusts affect an ecosystem? p. 149

P- ENB (prompt) Gather evidence to explain how</td><td>Lesson 3: Engineer It: Maintaining Biodiversity pp. 166-189

D/P – WIM Questions p. 128

D/P- CYEI (digital picture) How can biodiversity be maintained in the Everglades without shutting humans out of this endangered ecosystem? p. 167</td></tr>
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Standards: (MS-LS2-4) Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. (MS-LS2-5) Evaluate competing design solutions for maintaining biodiversity and ecosystem services. (MS-ETS1-1) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. (MS-ETS1-3) Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	**Instructional Days:** 30-35	what factors influence ecosystem recovery after a flood. p. 131 D/P- Describing Biodiversity (Students explore photos online to learn more about how living and nonliving components interact in ecosystems.) pp. 132-133 D/P- HOL Activity Measure Biodiversity (Using a jar of beans with six different types of dried beans, students use mathematical formulas to conduct a simulated measurement of two types of diversity of bumblebees in an area.) pp. 134-135 D/P- DTM Students determine the relative species abundance for each species in the sample area. p. 134 D/P- Evaluating Ecosystem Health: Energy Flows and	an insect swarm can affect an ecosystem. p. 149 D/P- Describing Changes in Ecosystems: Forest Floor Ecosystem (Students watch video to discover how ecosystems interact.) p. 150 P- ENB (prompt) Think about the swarm of locus, is the swarm a change to a living or a nonliving ecosystem component? Is the change gradual or sudden? p. 153 D/P- LS Analyze Rate of Environmental Change p. 154 D/P- LS Students analyze maps showing the distribution of red and gray squirrels in Great Britain and Ireland. p. 156 D/P- DTM Identify Factors That Change Populations (Students read and interpret information from	P- ENB (prompt) Gather evidence to help explain strategies for maintaining biodiversity in the Everglades. p. 167 D/P- Ecosystems Provide Natural Resources (Students complete digital activity by matching each product with the natural resource used to make it.) p. 169 D/P- DTM Compare Costs and Benefits of Shade-Grown Coffee (Using ratio and rate reasoning, students compare the costs and benefits of shade-grown coffee.) p. 172 P- ENB (prompt) Human activities have changed miles of Everglade wetlands for development. How do these changes affect ecosystem health and nearby communities?

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Objectives: Students will: Construct an argument to support or refute an explanation for the changes to populations in an ecosystem caused by disruptions to a physical or biological component of that ecosystem. Create design criteria for design solutions for maintaining biodiversity and ecosystem services. **Topics:** Renewable Resources; Environmental Issues; Biodiversity; and Twenty-First Century Themes and Skills (TFCTS) to include: The Four C's, Life and Career Skills, Information and Media literacy, Global Awareness, and Environmental Literacy **Essential Questions**: What happens to ecosystems when the environment changes? How can a single change to an ecosystem disrupt the whole system? What limits the number and variety of living things in an ecosystem?	Matter Cycles in Ecosystems (Students explore hotspots online to learn how energy and matter move through a desert ecosystem.) p. 136 D/P- Biodiversity Impacts Ecosystem Stability (Students explore hotspots on a digital graphic that models the stability of four different ecosystems during years with different amounts of rainfall.) p. 137 P- ENB (prompt) How would biodiversity levels affect the recovery of ecosystems along the Vltava River after the floodwaters rede? Students record evidence in their ENB. p. 138 D/P- DTM Assess Ecosystem Health (Students read and interpret a graph to make predictions about how an ecosystem might recover from a disturbance.) p. 138 D/P- Analyzing Human Influences on Biodiversity:	a graph to identify factors that caused changes in populations.) p. 157 D/P- HOL Activity What Factors Influence a Population Change? (Students simulate population changes in a pack of wolves and identify specific changes that affect the population of wolves.) pp. 158-159 P- ENB (prompt) What effects might the swarm of locusts have on other populations in an ecosystem? p. 159 D/P- ENGIT Forest Fire Control Policy: Students brainstorm ways to allow fire-dependent plants to carry out their life cycle while at the same time controlling fire hazards for other living things in the forest. p. 160 D/P- TIF (enrich) Ecological Succession pp. 161-162 D- Hands-On Labs; Cockroaches vs. Pandas; Propose Your Own Path	Students record evidence. p. 172 D/P- LS Evaluate Agricultural Practices (Students read text and evaluate a claim.) p. 173 D/P- Analyzing Strategies for Maintaining Biodiversity (Students explore images online to learn how humans impact the biodiversity of coral reefs.) p. 174 D/P- Two Endangered Keystone Species (Students watch videos to learn more about two endangered keystone species, otters and bluefin tuna.) p. 175 D/P- HOL Activity Model Habitat Fragmentation (Students will use sheets of paper to model undisturbed and fragmented habitats to draw conclusions about effects of habitat fragmentation.) pp. 176-177 D/P- DTM Students calculate and record the interior-to-edge ratio for

	Humans Depend on Ecosystem Services (Students watch video of humans introducing the European honeybee to the United States; these bees make honey and beeswax.) p. 139 P- ENB (prompt) Think about the image of the ecosystem before the flood. How have humans changed the area and how might this affect recovery after the flood? Students record evidence in their ENB. p. 141 D/P- LS Students write an argument about why people should work toward having positive influences on biodiversity; students support their claims with clear reasons and relevant evidence and present their argument to the class. p. 141 D/P- ENGIT Monitor and Preserve Biodiversity (Students work to improve a grid so they can most accurately count the plants inside.) p. 142	D/P- Lesson Self Check pp. 163-165 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 129G P- Extension p. 129G P- COLLAB p. 129H P- Connections to Other Disciplines p. 129H D-Science Safety HB D- CCC-Hb D- ELA-HB D-M-HB D- SEP-B D-ScienceSaurus Reference HB D- VBP The Produces of Florida Bay D- VL Changes in Ecosystem D- YSI Simulation Why Are Adelie Penguin Population Sizes Changing?	each habitat, using area and perimeter. p. 176 P- ENB (prompt) Restoration efforts in the Everglades include developing marshes that filter pesticides flowing into the everglades from farms farther north. How does this strategy directly affect wetland biodiversity and ecosystem services? Record evidence. p. 179 P- ENB (prompt) Restoring wetlands involves reclaiming existing ranches and farmland. What are the costs and benefits of this solution for humans and ecosystem services? Record evidence in ENB. p. 181 D/P- Case Study: Mountain Meadow Restoration (Students read case study and consider each of the criteria listed in the table; students rank the criteria on a scale from 1 to 4, with 4 being the most important and

	D/P- TIF (enrich) Careers in Science: Restoration Ecologist pp. 143-144 D- Hands-On Labs; You Are an Ecosystem; Propose Your Own Path D/P- Lesson Self Check pp. 145-147 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 129G P- Extension p. 129G P- COLLAB p. 129H P- Connections to Other Disciplines p. 129H D-Science Safety HB D- CCC-HB D- ELA-HB D- M-HB D- SEP-HB D-ScienceSaurus Reference HB		explain their reasoning. p. 182 D/P- Evaluate Proposed Design Solutions (Students use a decision matrix to score the proposed solutions to remove pine trees from the meadow.) p. 183 D/P- TIF (enrich) Careers in Science: Ecotourism pp. 185-186 D- Hands-On Labs; Backyard Biodiversity; Propose Your Own Path D/P- Lesson Self Check pp. 187-189 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 129G P- Extension p. 129G P- COLLAB p. 129H P- Connections to Other Disciplines p. 129H D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB

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			D- SEP-HB D-ScienceSaurus Reference HB

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Curriculum Alignment Common Language (CACL) Guide 6-8		
Acronym	**Word/Phrase**	**Description**
CER	Claims Evidence Reasoning	Students make a claim and gather evidence along the way (during EXPLORATORY activities) to support claim.
CCC-HB	Crosscutting Handbook	Students who need extra support in grasping concepts or to refresh student knowledge of skills.
CYEI	Can You Explain It	Lesson phenomenon used to ENGAGE students in learning at the beginning of the lesson.
CYSI	Can You Solve It	Lesson phenomenon used to ENGAGE students in learning at the beginning of the lesson.
D	Digital	Program resources and features in interactive digital form.
DI (ELL/RTI) **Extension** **COLLAB** **Connections to Other Disciplines**	Differentiated Instruction (English Language Learner/Response to Intervention) Collaboration Connections to Other Disciplines	A page that lists all learning activities used to differentiate learning, engage students in collaborative activities and connect learning to other subjects.
DTM	Do the Math	Integrated subject learning.
ENB	Evidence Notebook	Student notebook or journal used to gather evidence during EXPLORATORY learning activities to support their claims.
ENGIT	Engineer It	Integrated subject learning.
ELA-HB	English Language Arts Handbook	Students who need extra support in grasping concepts or to refresh student knowledge of skills.
HOL	Hands-On Lab	Activities or experiments that enable students to demonstrate scientific procedures and analysis.
LS	Language SmArts	Integrated subject learning.

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M-HB	Math Handbook	Students who need extra support in grasping concepts or to refresh student knowledge of skills.
P	Print	Program resources and features in print form.
SEP-HB	Science and Engineer Practices Handbook	Students who need extra support in grasping concepts or to refresh student knowledge of skills.
TIF	Take It Further (enrich)	Enrichment activities for students in digital or print.
VBP	Video Based Project	Real life videos related to science and/or engineering that enable students to demonstrate mastery of performance expectations.
VL	Virtual Lab	Fully interactive simulations in which students perform experiments, collect data and answer questions.
WIM	Why It Matters	Questions related to lessons within each unit that asks students to consider how science affects the world around them.
YSI	You Solve It (Simulation)	Open-ended simulation-based learning with multiple answer options.