EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

GRADE 7

EPSD Unit 5: Evidence of a Common Ancestry (part II)
Second Marking Period

<table>
<tr><td colspan="2" rowspan="2">Overview: In this unit of study, students analyze graphical displays and gather evidence from multiple sources in order to develop an understanding of how fossil records and anatomical similarities of the relationships among organisms and species describe biological evolution. Students search for patterns in the evidence to support their understanding of the fossil record and how those patterns show relationships between modern organisms and their common ancestors. The crosscutting concepts of cause and effect, patterns, and structure and function are called out as organizing concepts for these disciplinary core ideas. Students use the practices of analyzing graphical displays and gathering, reading, and communicating information. Students are also expected to use these practices to demonstrate understanding of the core ideas</td><td colspan="3">HMH Science Dimensions Program Resources Module D</td></tr>
<tr><td colspan="3">Unit 2: Evolution
Unit Video (Galapagos prickly pear cactus on the Galapagos islands); Why it Matters p. 74; Unit Starter p. 75; Vocabulary p. 75G; Unit Project p. 75I; Unit Connections p. 130; Unit Review pp. 131-134; Unit Performance Task pp. 135-136</td></tr>
<tr><td colspan="2" rowspan="2">Standards: (MS-LS4-1) Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in</td><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>Instructional Days: 20-25</td><td>Lesson 1: Genetic Change and Traits pp. 76-93

D/P- WIM Questions p. 74

D/P- CYEI (digital pictures) How can a change to just one gene cause a lobster to be blue? p.77

P- ENB (prompt) Gather evidence to help explain how a change to a gene can result in a blue lobster. p. 77</td><td>Lesson 2: Natural Selection pp. 94-113

D/P- WIM Questions p. 74

D/P- CYEI (digital picture) How has the smell of rotting flesh become an adaptation for the rafflesia flower? p. 95

P- ENB (prompt) Gather evidence to help explain how the rotting flesh smell</td><td>Lesson 3: Speciation and Extinction pp. 114-129

D/P- WIM Questions p. 74

D/P- CYEI (digital picture) Why did the number of mammal species on Earth suddenly explode over a relatively short period of time? p. 115

P- ENB (prompt) Gather evidence to help explain factors that led to the</td></tr>
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the past. (MS-LS4-2) Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. (MS-LS4-3) Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.		D/P- Genes Are Segments of DNA (Students go online to use drawing tools to complete the DNA sequence by adding complementary bases to the DNA strand) p. 79 D/P- Genes Code for Proteins (Students go online to use drawing tools to complete the DNA triplets and their corresponding amino acids.) p. 80 D/P- HOL Activity Model Protein Folding (Students use paper strips to model protein folding.) pp. 81-82 P- ENB (prompt) How might the change in the folding pattern of the paper strip proteins relate to the genetic change that causes a lobster to be blue? Record evidence. p. 82 D/P- LS Illustrate the Flow of Genetic Information (Students use the terms: protein, gene, trait, and amino acids, to make a	became an adaptation for the rafflesia flower. p. 95 D/P- DTM Calculate Allele Frequencies (Students calculate allele frequencies of a population of Mongolian gerbils and consider how they might change due to a change in their environment, such as a wildfire.) p. 97 D/P- Distribution of Traits (Students go online and explore the hotspots on the graph to learn more about the distribution of flower color for a population of wild lupine.) p. 98 P- ENB (prompt) Think of odor strength as a range of phenotypes (weak to strong) in the rafflesia population. What might the distribution of traits look like on a graph? Students record evidence in their ENB. p. 98 D/P- Modeling Natural Selection: Natural	rapid speciation of mammals on Earth. p. 115 D/P- Case Study: Speciation of Lemurs (Students explore map online do discover more about the speciation of Lemurs.) p. 117 D/P- HOL Activity Analyze Speciation of Salamanders (Students use habitat comparisons and a map to analyze the distribution of a group of closely related California salamanders; students also write an explanation about how speciation may have occurred from a single ancestral species.) pp. 118-119 P- ENB (prompt) How might the speciation of California salamanders relate to the speciation of mammals over time? Students record their evidence in their ENB. p. 119 D/P- LS Analyze Soapberry Bug Evolution (Students
Objective 1: Students will use graphs, charts, and images to identify patterns within the fossil record and determine similarities and differences in findings. **Objective 2**: Students will: Make logical and conceptual connections between evidence in the fossil record and explanations about the existence, diversity, extinction, and change in many life forms throughout the history of life on Earth. Apply the patterns in gross anatomical structures among modern organisms and between modern organisms and fossil organisms to construct explanations of evolutionary relationships.				

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Objective 3: Use diagrams or pictures to identify patterns and similarities in embryological development across multiple species. **Topics:** The Fossil Record; Anatomical Similarities; Embryological Development; and Twenty-First Century Themes and Skills (TFCTS) to include: The Four C's, Life and Career Skills, and Information, Media, and ITC Literacy. **Essential Questions**: How do we know that birds and dinosaurs are related? How do we know when an organism (fossil) was alive?	diagram or a concept map that shows the flow of genetic information that causes purple tomatoes; students also write a summary of the relationship between genes, proteins, and traits.) p. 83 D/P- DTM Calculate Mutation Rate (Students calculate the number of DNA mutations over millions of years and estimate the mutation rate for the future.) p. 85 P- ENB (prompt) What are the connections between mutation, protein structure and function, and the lobster's blue color? Students record evidence in their ENB. p. 86 D/P- ENGIT Identify Design Solution Constraints (Students read text and consider constraints for a solution to ozone depletion; students complete questions associated with the text.) p. 86	Selection (Students watch video of the horned lizard and explore online to learn more about natural selection.) p. 99 D/P- HOL Activity Model Natural Selection in a Population (Students model natural selection in a population and analyze data to draw conclusions about the environment's role in determining which traits help individuals to survive and reproduce.) pp. 100-101 P- ENB (prompt) What environmental factors might make a strong odor an advantage for the rafflesia? p. 101 D/P- ENGIT (Students identify problems that could be solved using artificial selection in plants and use their understanding of natural selection to compare and contrast artificial and natural selection.) p. 104 D/P- Case Study: Spine Number in Cacti (Students construct a distribution	use evidence from the text and graphs to explain how speciation might occur in this soapberry bug population.) p. 120 D/P- Explaining Extinction: Extinction Rates through Time (Students go online to take a closer look at the extinction rate of species throughout Earth's history.) p. 121 D/P- DTM Analyze MVP of Siberian Tigers (Students calculate the minimum viable population of tigers needed for the species to survive for more than 40 generations given current environmental conditions.) p. 123 P- ENB (prompt) Sixty-six million years ago, a mass extinction called the K-Pg extinction wiped out about 75% of all plant and animal species on Earth, including the flightless dinosaurs. How might this mass extinction have allowed for the rise of mammal species?

	P- ENB (prompt) Students identify whether the mutation that causes the blue color of the lobster is inherited and record evidence in their ENB. p. 87 D/P- Relate Traits to the Environment (Students read scenario and then sketch a mountain goat with a new, adaptive trait.) p. 88 D/P- TIF (enrich) Mutation and Phenotype pp. 89-90 D- Hands-On Labs; Mutagens; Propose Your Own Path D/P- Lesson Self Check pp. 91-93 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 75G P- Extension p. 75G P- COLLAB p. 75H P- Connections to Other Disciplines p. 75H	graph of the spine-number trait for the cactus population based on the information provided in the text.) p. 107 D/P- LS Students write an explanation of the selection pattern shown in their graph; students also explain how changes in the cacti's environment resulted in changes in the cactus population's trait. p. 107 P- ENB (prompt) Students identify how they would expect the distribution of traits for odor strength in rafflesia to change over many generations? p. 107 D/P- Analyzing Natural Selection in Medium Ground Finches (Students construct a bar graph that shows the average beak measurements before and after the drought.) p. 108 D/P- TIF (enrich) Evolution of Drug-Resistant Bacteria pp. 109-110	Students record their evidence. p. 124 D/P- ENGIT Engineer It: Identify Solutions for a Wildlife Corridor (Students read text and respond to questions in text. While reading text, students consider different solutions proposed to protect the lynx and consider how the solution impacts both the lynx and human needs.) p. 124 D/P- TIF (enrich) People in Science: Dr. Nancy Knowlton, Marine Biologist pp. 125-126 D- Hands-On Labs; Making a Microscope; Propose Your Own Path D/P- Lesson Self Check pp. 127-129 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 75G P- Extension p. 75G P- COLLAB p. 75H

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	D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB D- SEP-HB D-ScienceSaurus Reference HB D- YSI Simulation Is Antibiotic Use Related to Antibiotic Resistance in E. coli?	D- Hands-On Labs; Early Ideas about Evolution; Propose Your Own Path D/P- Lesson Self Check pp. 111-113 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 75G P- Extension p. 75G P- COLLAB p. 75H P- Connections to Other Disciplines p. 75H D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB D- SEP-HB D-ScienceSaurus Reference HB	P- Connections to Other Disciplines p. 75H D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB D- SEP-HB D-ScienceSaurus Reference HB D- VBP Expedition Evolution

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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.