EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

GRADE 7

EPSD Unit 4: Selection and Adaption
Second Marking Period

Overview: Students construct explanations based on evidence to support fundamental understandings of natural selection and evolution. They will use ideas of genetic variation in a population to make sense of how organisms survive and reproduce, thus passing on the traits of the species. The crosscutting concepts of patterns and structure and function are called out as organizing concepts that students use to describe biological evolution. Students use the practices of constructing explanations, obtaining, evaluating, and communicating information, and using mathematical and computational thinking. Students are also expected to use these practices to demonstrate understanding of the core ideas.		**HMH Science Dimensions Program Resources Module B**		
		Unit 3: Reproduction, Heredity, and Growth **Unit Video** (a male bird of paradise attracts a female bird); **Why it Matters** p. 122; **Unit Starter** p. 123; **Vocabulary** p. 123I; **Unit Project** p. 123K; **Unit Connections** p. 196; **Unit Review** pp. 197-200; **Unit Performance Task** pp. 201-202		
		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.		
Standards: (MS-LS4-4) Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. (MS-LS4-5) Gather and synthesize information about the	**Instructional Days:** 15-20	**Lesson 1:** Inheritance pp. 124-139 D/P – WIM Questions p. 122 D/P- CYEI (digital picture) How did these kittens get their fur colors? p. 125 P- ENB (prompt) Gather evidence to	**Lesson 2:** Asexual and Sexual Reproduction pp. 140-155 D/P- WIM Questions p. 122 D/P- CYEI (digital picture) Why is the Cavendish banana in danger of extinction? p. 141	**Lesson 3:** Plant Reproduction and Growth pp. 156-175 D/P- WIM Questions p. 122 D/P- CYEI (digital picture) How does the structure of the sacred lotus flower relate to reproduction? p. 157	**Lesson 4:** Animal Reproduction and Growth pp. 176-195 D/P- WIM Questions p. 122 D/P- CYEI (digital picture) Why are these male zebras fighting? p. 177 P- ENB (prompt) Gather evidence to help explain why

technologies that have changed the way humans influence the inheritance of desired traits in organisms. (MS-LS4-6) Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.		help explain how kittens got their fur color. p. 125 D/P- LS Construct an Explanation of Trait Inheritance (Students explain how Mendel's data supported his hypothesis and support their answer by citing evidence from the lesson. Students also explain which trait is recessive when Mendel crossed a true-breeding plant with yellow peas with a true-breeding plant with green peas and all first -generation offspring had yellow peas.) p. 127 D/P- HOL Activity Model Genes and Traits (Students model how genetic variation can be influenced by environmental	P- ENB (prompt) Gather evidence to help explain why the Cavendish banana is facing extinction. p. 141 P- ENB (prompt) Banana plants grown for food crops are the result of asexual reproduction. Does the genetic information of each plant come from one or two parents? Students record evidence. p. 143 D/P- ENGIT Develop a Hybrid (A rose farmer needs to grow plants that produce orange flowers in the colder, fall months; students describe how the farmer might try to produce this hybrid.) p. 144	P- ENB (prompt) Gather evidence to help explain the function of the sacred lotus flower. p. 157 P- ENB (prompt) The sacred lotus flower has a large seedpod that eventually dries out and causes the flower to bend over; students identify how they think the sacred lotus flower's seeds are dispersed and record their evidence in their ENB. p. 161 D/P- LS Construct an Argument (Students use evidence to construct an argument for why producing seeds might be more advantageous than	male zebras fight with each other. p. 177 P- ENB (prompt) What type of animal is the zebra? Students also identify if they think the zebra reproduces asexually or sexually. p. 180 D/P- LS Evaluate Reproductive Strategies (Students cite evidence from the text to explain how using both types of reproduction influences the distribution of aggregating anemone populations.) p. 181 D/P- Courtship Behaviors (Students watch video to see a male manakin "moonwalk" across a branch to impress a mate) p. 182
Objective 1: Students will: Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information. Develop and use a model to describe why sexual reproduction results in offspring with genetic variation. **Objective 2:** Students will: Use models such as Punnett squares, diagrams, and simulations to describe the cause-and effect-relationship of gene transmission from parent(s) to offspring and resulting genetic variation. Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. **Objective 3:** Students will: Identify and describe possible cause-and effect relationships affecting the reproductive success of plants and animals					

using probability. Support or refute an explanation of how characteristic animal behaviors and specialized plant structures affect the probability of successful plant reproduction using oral and written arguments. Use evidence from experiments and other scientific reasoning to support oral and written explanations of how environmental and genetic factors influence the growth of organisms. **Topic 1:** Cell Division (mitosis/meiosis); DNA; Cancer; Mendel's Work; Probability and Heredity; Chromosomes; Mutation; Genetic Disorders; and Twenty-First Century Themes and Skills (TFCTS) to include: The Four C's, Life and Career Skills, and Information, Media, and ITC Literacy **Topic 2:** Probability of Successful Reproduction; Environmental Effects and TFCTS **Essential Questions**: How can changes to the genetic code increase or decrease an individual's chances of survival? How can the environment effect natural selection? Are Genetically Modified Organisms (GMO) safe to eat?	factors, using a hypothetical fish species; students use evidence to predict, over several generations, the proportions of dominant and recessive alleles in the population.) pp. 130-131 P- ENB (prompt) Students think about the different phenotypes of fish scale color in the lab and the phenotypes of fur color in the kittens at the beginning of the lesson. Students use evidence from the lab to explain why all of the kittens do not have the same fur color, even though they have the same parents.) p. 131 D/P- ENGIT (From three choices, students select the process that would	D/P- DTM Calculate the Rate of Asexual Reproduction (Students assess the growth of bacteria based on their rate of reproduction; students use data in the table to make a graph of the change in the number of bacteria over time.) p. 146 D/P- HOL Activity Model Asexual and Sexual Reproduction (Students model asexual and sexual reproduction and use predictions of genotypes ad phenotypes to determine the relationship between each type of reproduction and genetic diversity.) pp. 148-149	not producing seeds to the reproductive success of a plant species.) p. 162 D/P- Analyzing the Reproductive Success of Flowering Plants (Students watch video of the hawk moth visiting a flower and explore online to learn more about pollination in flowering plants.) pp. 163-164 D/P- HOL Activity Investigate Flower Structures (Students dissect a flower and record drawings of the structures they discover.) pp. 165-166 P- ENB (prompt) The sacred lotus flower is pollinated by bees and beetles. How do the traits of the	P- ENB (prompt) Is the fighting behavior of the zebras a courtship behavior or a parenting behavior? How might this behavior affect the reproductive success of the male zebra? Students record their evidence in the ENB. p. 183 D/P- DTM Analyze Female Mate Choice (Students analyze data in a graph to explain mate choices of female guppies.) p. 185 D/P- ENGIT Explain Trait Selection in Dog Breeds (Students read text and compare and contrast the traits that would be desirable in a dog that helps police locate explosives and a dog that

	allow the horticulturist to grow only purple-flowered plants in the shortest amount of time.) p. 132 P- ENB (prompt) Many traits, such as fur color, are determined by more than one gene. How might the influence of multiple genes affect the number of possible phenotypes for fur color? Students record evidence in their ENB. p. 134 D/P- DTM Calculate Genotype Probability (Students complete a Punnett square to find the probability of an offspring's genotype and phenotype.) p. 134	P- ENB (prompt) Students describe the genetic variation of the banana plants grown for food and identify how they think this level of variation relates to the threat of Panama disease in banana crops; students record evidence in their ENB. p. 150 D/P- LS Compare Asexual and Sexual Reproduction (Students compare asexual reproduction and sexual reproduction by completing the Venn diagram.) p. 150 D/P- TIF (enrich) Factors That Influence Reproduction pp. 151-152	sacred lotus flower help attract these pollinators? p. 166 D/P- DTM Analyze Honeybee Colony Loss (Students analyze data from a graph to explain patterns of honeybee colony losses in the United States.) p. 167 D/P- ENGIT Explore Tomato Hybrids (Students analyze solutions in growing hybrid tomatoes for possible advantages and pitfalls; students evaluate each solution to determine modifications that can be made to optimize their solution.) p. 169 D/P- TIF (enrich) Capsaicin Levels in	provides companionship for the elderly.) p. 187 D/P- HOL Activity Model the Growth of an Animal (Students work with a group of peers to design a board game that models how genetic and environmental factors affect animals.) pp. 189-190 D/P- TIF (enrich) Teaching Offspring pp. 191-192 D- Hands-On Labs; Effect of Temperature on Gender; Propose Your Own Path D/P- Lesson Self Check pp. 193-195 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 123I

	D/P- TIF (enrich) People in Science pp. 135-136 D- Hands-On Labs; Genetic Engineering; Propose Your Own Path D/P- Lesson Self Check pp. 137-139 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 123I P- Extension p. 123I P- COLLAB p. 123J P- Connections to Other Disciplines p. 123J D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB D- SEP-HB D-ScienceSaurus Reference HB	D- Hands-On Labs; Odd Reproduction; Propose Your Own Path D/P- Lesson Self Check pp. 153-155 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 123I P- Extension p. 123I P- COLLAB p. 123J P- Connections to Other Disciplines p. 123J D/P- Lesson Self Check pp. 153-155 D- Lesson Quiz D-Make Your Own Study Guide D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB D- SEP-HB	Peppers pp. 171-172 D- Hands-On Labs; Seed Vaults; Propose Your Own Path D/P- Lesson Self Check pp. 173-175 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 123I P- Extension p. 123I P- COLLAB p. 123J P- Connections to Other Disciplines p. 123J D-Science Safety HB D- CCC-Hb D- ELA-HB D-M-HB D- SEP-HB D-ScienceSaurus Reference HB D- YSI Simulation What Factors	P- Extension p. 123I P- COLLAB p. 123J P- Connections to Other Disciplines p. 123J D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB D- SEP-HB D-ScienceSaurus Reference HB D- YSI Simulation What Factors Affect Reproductive Success?

EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

		D-ScienceSaurus Reference HB	Affect Reproductive Success?	

EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

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.

EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

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.