EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

GRADE 7

EPSD Unit 6: Matter and Energy in Organisms and Ecosystems
Third Marking Period

<table>
<tr><td colspan="2" rowspan="2">Overview: Students analyze and interpret data, develop models, construct arguments, and demonstrate a deeper understanding of the cycling of matter, the flow of energy, and resources in ecosystems. They are able to 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 populations. They also understand that the limits of resources influence the growth of organisms and populations, which may result in competition for those limited resources. The crosscutting concepts of matter and energy, systems and system models, patterns, and cause and effect provide a framework for understanding the disciplinary core ideas. Students demonstrate grade-appropriate proficiency in analyzing and interpreting data, developing models, and constructing arguments. 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 C</td></tr>
<tr><td colspan="3">Unit 1: Mater and Energy and Living Systems
Unit Video (giant panda eating); Why it Matters p. 2; Unit Starter p. 3; Unit Project p. 3I; Unit Review pp. 59-62; Vocabulary p. 3G; Unit Connections p. 58; Unit Performance Task pp. 63-64</td></tr>
<tr><td colspan="2" rowspan="2">Standards: (MS-LS2-1) Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.</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: 40-45</td><td>Lesson 1: Matter and Energy in Organisms pp. 4-23

D/P – WIM Questions p. 2

D/P- CYEI (video) What happened to the matter and energy that were in these fruits when they were first picked? p. 5

P- ENB (prompt) Gather evidence to explain what happened to the matter</td><td>Lesson 2: Photosynthesis and Cellular Respiration pp. 24-41

D/P – WIM Questions p. 2

D/P- CYEI (digital picture) How can these microscopic organisms be so important for life on Earth? p. 25

P- ENB (prompt) Gather evidence to explain why phytoplankton are so</td><td>Lesson 3: Matter and Energy in Ecosystems pp. 42-57

D/P – WIM Questions p. 2

D/P- CYEI (video) How could the reintroduction of wolves to Yellowstone have led to an increase in the beaver population? p. 43

P- ENB (prompt) Gather evidence to explain how the return of wolves caused</td></tr>
</table>

(MS-LS2-2) Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. (MS-LS2-3) Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.		and energy in the decomposed fruits. p. 5 D/P- Atoms Are the Building Blocks of Matter: Elements of the Human Body, by Mass (Students explore chart online to learn about the elements that make up the human body.) p. 7 D/P- Atoms Bond to Form Molecules (Students use drawing tools to differentiate hydrogen, carbon, oxygen atoms.) p. 8 D/P- DTM Analyze Size and Scale of Matter (Students examine models to reinforce the organization of matter and calculate the percent of a whole, gathering information from the text.) p. 9 D/P- Energy in Organisms: Energy Sources of Plants and Animals (Students explore photo to find out how energy flows through organisms.) pp. 9-10	important for life on Earth. p. 25 D/P- Analyze the Chemistry of Cells (Students go online to view the video of the chemical reaction in the flower.) p. 26 D/P- Chemical Reactions: Explore a Chemical Reaction (Students explore hotspots online to learn more about the chemical reaction between the flower and the chemical solution.) pp. 26-27 D/P- Chemical Equations (Students build a chemical equation that shows the reaction between water and carbon dioxide.) p. 27 D/P- Carbon-Based Molecules: Molecular Structure of Foods (Students go online to take a closer look at foods that have food molecules	Yellowstone's beaver population to increase. p. 43 P- ENB (prompt) How do you think the beavers, elk, deer, and wolves are related in a food web? p. 46 D/P- HOL Activity Model Energy Flow in an Ecosystem p. 47 P- ENB (prompt) What happens to producer populations in Yellowstone when elk and deer populations become smaller? How might these changes explain the increase in the beaver population? p. 48 P- ENB (prompt) How might the wolves help increase the plant growth that stabilizes the rivers the beavers rely on to live? p. 50 D/P- ENGIT Analyze a Solution: Students consider the benefits of artificial trees exchanging carbon
Objective 1: Students will: Use cause-and-effect relationships to predict the effect of resource availability on organisms and populations in natural systems. Make predictions about the impact within and across ecosystems of competitive, predatory, or mutually beneficial relationships as abiotic (e.g., floods, habitat loss) or biotic (e.g., predation) components change. **Objective 2:** Students will develop a model to describe the cycling of matter and energy among living and nonliving parts of an ecosystem.				
Topics: Biotic and Abiotic Factors; Populations and Communities; Relationships in Ecosystems; Food Webs; Biomes; Succession; 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.				

EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

Essential Questions: How and why do organisms interact with their environment and what are the effects of these interactions? How do changes in the availability of matter and energy effect populations in an ecosystem? How do relationships among organisms, in an ecosystem, effect populations? How can you explain the stability of an ecosystem by tracing the flow of matter and energy?	D/P- Organisms Need Sources of Matter and Energy (Students go online to record their intake of food and classify it as either plant or animal matter; students also use photos and text to cite the sources of three organisms' matter and energy.) pp. 11-12 P- ENB (prompt) Which group of organisms is breaking down the matter and using the energy in the decaying fruit from the beginning of the lesson? Students record evidence in their ENB. p. 13 D/P- HOL Activity Investigate Decomposition (Students observe plant matter to construct an explanation of how soil conditions affect the rate of decomposition.) pp. 14-15 D/P- ENGIT Explore Bioremediation Students consider the limitations of bioremediation and its feasibility for cleaning up	that provide energy.) pp. 27-28 D/P- Model a Chemical Reaction (Students go online to differentiate between molecules that are the reactants and molecules that are the products.) p. 28 P- ENB (prompt) Students identify areas on the map where phytoplankton might be the main producers and identify how much primary productivity is found in areas where phytoplankton are abundant.) p. 29 D/P- HOL Activity Investigate the Effect of Sunlight on Elodea (Students observe an aquatic plant, Elodea, to determine the relationship between sunlight and carbon dioxide uptake by the plant.) pp. 30-31 D/P- Photosynthesis: Cytoplasmic Streaming (Students view video of chloroplast streaming and	dioxide and oxygen in urban areas. p. 51 P- CER Students make a claim, and support it with evidence, as to why water, carbon and nitrogen all have cycles. p. 51 D/P- LS Diagram the Cycling of Matter p. 52 D/P- TIF (enrich) People in Science: Charles Elton, Ecologist pp. 53-54 D- Hands-On Labs; Biomagnification; Propose Your Own Path D/P- Lesson Self Check pp. 55-57 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 3G P- Extension p. 3G P- COLLAB p. 3H P- Connections to Other Disciplines p. 3H D-Science Safety HB D- CCC-HB D- ELA-HB

	oil spills on a large scale. p. 16 D/P- Relating Cycling of Matter to Transfer of Energy: Energy and Matter Are Conserved (Students go online to show the sequence of how matter and energy are used in the life of a tree.) p. 17 P- ENB (prompt) Could any of the matter and energy in the decaying fruits have disappeared? Record evidence. p. 17 D/P- LS Cite Evidence for Conservation of Matter and Energy (Students use examples of the life of a tree to write a short explanatory text that explains how matter and energy were not created or destroyed over the course of the tree's life; students describe the flow of matter and energy in their explanation.) p. 18 D/P- TIF (enrich) Chemotrophs pp. 19-20	explore online to learn about how photosynthesis takes place in chloroplast.) p. 32 D/P- ENGIT Explore Use of Algae as Biofuel (Students read text and explain why algal biofuels have advantages over nonrenewable fossil fuels. Students may also research other forms of renewable biofuels such as, ethanol, sugarcane, or sunflowers.) p. 33 D/P- Cellular Respiration (Students explore hotspots online to learn more about cellular respiration.) p. 34 D/P- DTM Compare Reactants and Products (Students analyze the reactants and products of cellular respiration to observe and understand that the number of atoms of each type is the same before and after the reaction.) p. 35 D/P- LS Relate Photosynthesis and	D-M-HB D- SEP-HB D-ScienceSaurus Reference HB D- YSI Simulation How Does a Tabletop Biosphere Work?

	D- Hands-On Labs; Cosmic Dust; Propose Your Own Path D/P- Lesson Self Check pp. 21-23 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 3G P- Extension p. 3G P- COLLAB p. 3H P- Connections to Other Disciplines p. 3H D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB D- SEP-HB D-ScienceSaurus Reference HB	Cellular Respiration (Students complete the diagram that shows the relationship between reactants and products of photosynthesis and cellular respiration; students also write an explanation to describe the relationship between the starting reactants and the products of photosynthesis and cellular respiration.) p. 36 P- ENB (prompt) How do organisms use the products of photosynthesis from phytoplankton? Students record answers in their ENB. p. 36 D/P- TIF (enrich) Fermentation pp. 37-38 D- Hands-On Labs; Primary Productivity; Propose Your Own Path D/P- Lesson Self Check pp. 39-41 D- Lesson Quiz D-Make Your Own Study Guide	

		P- DI (ELL/RTI) p. 3G P- Extension p. 3G P- COLLAB p. 3H P- Connections to Other Disciplines p. 3H D-Science Safety HB D- CCC-HB D- ELA-HB D-M-HB D- SEP-HB D-ScienceSaurus Reference HB D- VBP Photosynthesis D- VL Observing Photosynthesis D- VL What Affects Photosynthesis Rate?	

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.