EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

GRADE 8

EPSD Unit 3: Chemical Reactions (part II)
Second Marking Period

<table>
<tr><td colspan="2" rowspan="2">Overview: Students provide molecular-level accounts of states of matters and changes between states, of how chemical reactions involve regrouping of atoms to form new substances, and of how atoms rearrange during chemical reactions. Students also apply their understanding of optimization design and process in engineering to chemical reaction systems. The crosscutting concept of energy and matter provides a framework for understanding the disciplinary core ideas. Students are expected to demonstrate proficiency in developing and using models, analyzing and interpreting data, designing solutions, and obtaining, evaluating, and communicating information. Students are also expected to use these science and engineering practices to demonstrate understanding of the disciplinary core ideas.</td><td colspan="2">Science Dimensions Program Resources Module J</td></tr>
<tr><td colspan="2">Unit 4: The Chemistry of Materials
Unit Video (paint pigments); Why it Matters p. 180; Unit Starter p. 181; Vocabulary p. 181G; Unit Project p. 181I; Unit Connections p. 226; Unit Review pp. 227-230; Unit Performance Task pp. 231-232</td></tr>
<tr><td colspan="2" rowspan="2">Standards: (MS-PS1-5) Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. (MS-ETS1-3) Analyze data from tests to determine similarities and differences among several design solutions to identify the</td><td colspan="2">Standard for all Units: (D) Interactive Multilingual Glossary; (D/P) Unit Pretest; (D) Lesson Quizzes; (D/P) Unit Tests

Note: Refer to the Curriculum Alignment Common Language (CACL) Guide to decipher acronyms.</td></tr>
<tr><td>Instructional Days: 25-30</td><td>Lesson 1: Natural and Synthetic Materials pp. 182-203

D/P- WIM Questions p. 180

D/P- CYEI (digital picture) How can a plastic kayak be made from oil? p. 183

P- ENB (prompt) As students explore this lesson, they consider how oil can be made into a plastic kayak. p. 183
D/P- Materials: Physical Properties (Students think about the materials they interact with every day and describe their physical properties; students complete</td><td>Lesson 2: Engineer It: The Life Cycle of Synthetic Materials pp. 204-225

D/P- WIM Questions p. 180

D/P- CYEI (digital picture) How can the same molecules that make up the bottles later be used to make the jacket? p. 205

P- ENB (prompt) Gather evidence to explain how the material in plastic bottles can be turned into a jacket. p. 205
D/P- Synthetic Materials and Society (Students explore images online to learn more about how materials meet needs, desires and values.) p. 207</td></tr>
</table>

best characteristics of each that can be combined into a new solution to better meet the criteria for success.		the table to show whether each material has the properties listed.) p. 185 D/P- ENGIT Students consider why it is important to determine the properties of certain materials; students use examples from the table to support their answer. p. 185 D/P- Chemical Properties (Students explore images online to learn more about the chemical properties of materials.) p. 186 D/P- Materials for Different Uses (Students think about the properties of each materials in the table and identify whether each material would be good for each use.) p. 187 D/P- Relate the Properties and Uses of Materials (For each material in the table, students list at least <u>two physical properties</u>, <u>one chemical property</u>, and <u>three uses</u>.) p. 187 D/P- Natural Resources (Students explore images online to learn how natural resources are used and describe how they use two living and two nonliving natural resources every day.) pp. 188-189 D/P- Natural Resources for Different Uses (Students explore images online to learn more about the different uses of a natural resource and describe some of the chemical and physical properties and uses of each natural resource shown in the photos. p. 190	D/P- Phases of the Life Cycle (Students explore the diagram online to learn more about the phases of the life cycle.) pp. 208-210 P- ENB (prompt) How can the end of the life cycle of a plastic bottle be the beginning of the life cycle of a polyester jacket? Students record evidence in their ENB. p. 211 D/P- LS Model the Life Cycle (Students write a story about the life cycle of a plastic or paper shopping bag and draw a diagram to model the life cycle of the plastic or paper bag.) p. 211 D/P- Disposal (Students explore images online to learn more about cell phone disposal) p. 215 D/P- DTM Analyze the Economics of Recycling (Students consider the economic benefit of using recycled materials for producing new products and use their knowledge of topic to solve math problems.) p. 216 D/P- The Role of Engineering in the Life Cycle (Students discuss and record responses to the following question: What role might engineers play in the life cycle of a material? Students also discuss how they might be involved in extracting materials, making and improving materials and products, improving distribution, and sorting recyclables.) p. 217
Objectives: Students will: Use physical models or drawings, including digital forms, to represent atoms in a chemical process. Use mathematical descriptions to show that the number of atoms before and after a chemical process is the same. Undertake a design project, engaging in the design cycle, to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.			
Topics: Periodic Table Bonding Conservation of Mass Endo/Exothermic Reactions Solutions/Acids/Bases Reaction Rates Twenty-First Century Themes and Skills include: • The Four C's • Life and Career Skills • Information and Media literacy.			
Essential Questions: How do substances combine or change (react) to make new substances? What happens to the atoms when I bake a cake? How can a device be designed, constructed, tested, and modified that either releases or absorbs thermal energy by chemical processes?			

	D/P- DTM Analyze Natural Resource Use (Students write and solve equations to calculate the amount of dried lumber that is used for paper, plywood, and boards.) p. 191 D/P- Investigating Synthetic Materials (Students make a list of the parts of the bicycle in the photo and the materials that they might be made of. Students sort their list into materials that might be natural resources. Students compare and discuss their list with a partner. Student partners revise lists as they come to an agreement, record their final list and share with the class.) p. 192 P- With a group, students act out and/or model how ethylene molecules react to form polyethylene. p. 193 P- ENB (prompt) How might the substances in oil change into the substances that make up the plastic of a kayak? Students record evidence in their ENB. p. 193 D/P- HOL Activity Make a Synthetic Material (Students use a chemical reaction to make a ball out of a synthetic material.) p. 194 D/P- How Synthetic Materials are Used (Students explore images online to learn more about how synthetic materials are used.) p. 195 P- ENB (prompt) How could a chemical reaction change oil into a new material	D/P- HOL Activity Sort Synthetic Materials Using Properties (Students design a process to separate materials and watch video to see materials being sorted at a recycling plant.) pp. 219-220 D/P- ENGIT Analyze the Life Cycle of Carbon Fibers (Students consider carbon fiber as a solution to problems but learn that the high expense is a drawback of the solution. Students propose ways for engineers to improve the production or use of the product.) p. 220 P- ENB (prompt) How could plastic bottles be recycled to make plastic that could be turned into a jacket? Students record evidence in their ENB. p. 220 D/P- TIF (enrich) Careers in Engineering: Materials Engineer pp. 221-222 D- Hands-On Labs; Researching Life Cycles; Propose Your Own Path D/P- Lesson Self Check pp. 223-225 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 181G P- Extension p. 181G P- COLLAB p. 181H P- Connections to Other Disciplines p. 181H D-Science Safety HB

	with different properties? What properties of the plastic are important for a kayak? Record evidence. p. 196 D/P- ENGIT Students consider the properties of a screen and define criteria that engineers should consider when designing organic light-emitting diode materials. p. 197 D/P- LS Determine Sources and Uses of Synthetic Materials (Students identify which sources from a list would be the most reliable sources of information about synthetic vanillin; students also identify if some sources would be reliable for certain types of information, but not others.) p. 198 D/P- TIF (enrich) How Oil Is Used pp. 199-200 D- Hands-On Labs; Biomimicry; Propose Your Own Path D/P- Lesson Self Check pp. 201-203 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 181G P- Extension p. 181G P- COLLAB p. 181H P- Connections to Other Disciplines p. 181H D-Science Safety HB	D- CCC-HB D- ELA-HB D- M-HB D- SEP-HB D-ScienceSaurus Reference HB

	D- CCC-HB D- ELA-HB D- M-HB D- SEP-HB D-ScienceSaurus Reference HB D- YSI Simulation How Can You Make a Synthetic Magnet?	

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.

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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.