EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

GRADE 8

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

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.		**Science Dimensions Program Resources Module J**		
		Unit 3: Chemical Processes and Equations **Unit Video** (a crystal of progesterone, an important hormone in the body); **Why it Matters** p. 114; **Unit Starter** p. 115; **Vocabulary** p. 115G; **Unit Project** p. 115I; **Unit Connections** p. 172; **Unit Review** pp. 173-176; **Unit Performance Task** pp. 177-178		
		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.		
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	**Instructional Days:** 25-30	**Lesson 1:** Chemical Reactions pp. 116-131 D/P- WIM Questions p. 114 D/P- CYEI (video) What happens when sulfuric acid is added to powdered sugar? p. 117 P- ENB (prompt) Gather evidence to help explain what is happening when the sulfuric acid is added to the sugar. p. 117	**Lesson 2:** Chemical Equations pp. 132-151 D/P- WIM Questions p. 114 D/P- CYEI (video) How does this chemical equation explain what happens when cooper is reacts with silver nitrate? p. 133 P- ENB (prompt) Gather evidence to help account for the matter that is	**Lesson 3:** Engineer It: Thermal Energy and Chemical Processes pp. 152-171 D/P- WIM Questions p. 114 D/P- CYEI (video) How can a device warm food without using fire or electricity? p. 153 P- ENB (prompt) Gather evidence to help explain how a device could warm

best characteristics of each that can be combined into a new solution to better meet the criteria for success.		P- ENB (prompt) Students identify how properties of matter might help them explain what happened when sulfuric acid was mixed with powdered sugar. Students record evidence in their ENB. p. 117 D/P- DTM Compare Properties of Matter (Students use mass and volume data to calculate the densities of two different substances and to compare their properties.) p. 120 D/P- Comparing Physical Changes and Chemical Reactions (Students watch videos to observe examples of physical changes and chemical reactions; students also explore online to learn more about physical changes and chemical reactions.) pp. 121-123 P- ENGIT Collaborate (Students brainstorm a list of criteria for building a pipe system to deliver water and then use their	rearranged in a chemical reaction. p. 113 D/P- Chemical Formulas (Students explore images online to learn about sodium hydroxide, which has the chemical formula NaOH.) p. 134 D/P- Chemical Formulas (Students explore images online to see how the chemical formula H2SO4 describes a molecule of sulfuric acid.) p. 135 D/P- Analyzing Chemical Equations (Students make their own drawing to model reactants rearranging and forming new products.) p. 137 D/P- Chemical Equations (Students explore images online to examine the parts of a chemical equation and show chemical equations that represents a model of a chemical reaction.) pp. 138-139 D/P- LS Students match each description of a chemical reaction with	food without using fire or electricity. p. 153 D/P- Types of Energy Transfer (Students explore images online to see how energy flows as heat.) p. 155 D/P- Model Energy Movement (Students use drawing tools to show how thermal energy would flow through a system with ice cubes.) p. 156 P- ENB (prompt) How would the energy flow in a device that warms food without using a flame or electricity? Students record evidence in their ENB. p. 156 D/P- Analyzing Energy in Chemical Processes (Students watch video to see how the temperature of a hand warmer changes; students also identify which type of energy is likely changed into thermal energy.) p. 157 D/P- Chemical Processes and Thermal Energy (Students watch videos to
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?				

	understanding of physical and chemical properties to identify their criteria.) p. 123 D/P- Signs of a Possible Chemical Reaction (Students explore images online to learn about signs that a chemical reaction may have taken place.) p. 124 P- ENB (prompt) Students identify how knowing the indicators of a chemical reaction might help them explain what happened when the sulfuric acid was mixed with powdered sugar. Students also identify how this relates to the rearrangement of atoms that occur in a chemical reaction; students record evidence in their ENB. p. 124 D/P- HOL Activity Observe Substances Before and After a Change (Students observe substances before and after they are mixed to determine whether a physical change or	the equation that models it. p. 140 D/P- HOL Activity Observe a Chemical Reaction (Students plan, carry out, and observe a chemical reaction and examine an equation that models what happens in the reaction.) p. 141 P- ENB (prompt) How does a chemical equation help to keep track of what happens in a chemical reaction? Record evidence. p. 142 D/P- ENGIT (Students brainstorm how an engineer might prevent light from speeding up the change from hydrogen peroxide to oxygen and water when designing the container.) p. 142 D/P- The Conservation of Matter: Model a Balanced Chemical Equation (Students examine each molecule represented in the chemical reaction and then show the numbers of each type of atom	see how different chemical processes affect the thermal energy of a system and then match the chemical processes shown in the video to the change in thermal energy that occurs during the process.) p. 158 P- ENB (prompt) How might the rates of energy transformation affect how the flameless heater is able to warm objects? Students record evidence. p. 158 D/P- DTM Analyze Thermal Energy (Students analyze data from a table to identify the amount of energy released in several reactions.) p. 159 D/P- Factors That Affect Reaction Rates (Students explore the images online to see how different factors affect reaction rates.) p. 160 D/P- LS Analyze a Chemical Process (Students make a sketch that shows how thermal and chemical energy interact in the

	chemical change occurs.) p. 125 D/P- LS Students create a labeled diagram using their own pictures and words to show and explain the processes that are going on as a candle burns. p. 126 D/P- TIF (enrich) Chemistry and Engineering: Airbags pp. 127-128 D- Hands-On Labs; Chemical Reactions Are Essential for Life; Propose Your Own Path D/P- Lesson Self Check pp. 129-131 D- Lesson Quiz D-Make Your Own Study Guide P- DI (ELL/RTI) p. 115G P- Extension p. 115G P- COLLAB p. 115H P- Connections to Other Disciplines p. 115H D-Science Safety HB D- CCC-HB D- ELA-HB D- M-HB	there are in the reactants and the products; students compare the numbers when they are finished.) p. 145 P- ENB (prompt) How do balanced chemical equations help to account for everything that happens in a chemical reaction? Students record evidence in their ENB. p. 145 D/P- DTM Students compare the number of atoms of each element on both sides of several chemical equations in order to determine whether or not the equation is balanced. p. 146 D/P- TIF (enrich) Balancing a Chemical Equation pp. 147-148 D- Hands-On Labs; Chemistry in the Kitchen; Propose Your Own Path D/P- Lesson Self Check pp. 149-151 D- Lesson Quiz	system made up of water and ammonium chloride; students also describe the flow of energy shown in their sketch of the water and ammonium chloride system.) p. 161 D/P- HOL Activity Choose A Chemical Process (Students work in pairs to test several different chemical processes to design a chemical cold pack.) pp. 163-164 D/P- Design a Container (Students work together to design a possible container for their cold pack.) p. 165 D/P- TIF (enrich) People in Science: Fritz Haber and Carl Bosch, Chemists pp. 167-168 D- Hands-On Labs; Researching Chemical Processes; Propose Your Own Path D/P- Lesson Self Check pp. 169-171 D- Lesson Quiz D-Make Your Own Study Guide

	D- SEP-HB D-ScienceSaurus Reference HB D- VL Change of Pace D- VL What Factors Affect the Rate of a Chemical Reaction?	D-Make Your Own Study Guide P- DI (ELL/RTI) p. 115G P- Extension p. 115G P- COLLAB p. 115H P- Connections to Other Disciplines p. 115H D-Science Safety HB D- CCC-HB D- ELA-HB D- M-HB D- SEP-HB D-ScienceSaurus Reference HB	P- DI (ELL/RTI) p. 115G P- Extension p. 115G P- COLLAB p. 115H P- Connections to Other Disciplines p. 115H D-Science Safety HB D- CCC-HB D- ELA-HB D- M-HB D- SEP-HB D-ScienceSaurus Reference HB D- YSI Simulation How Can You Design a Heat Pack?

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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.