EPSD Curriculum and

HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

GRADE 6

EPSD Unit 3: Earth's Waters Second Marking Period

Overview: This unit is broken down into two subideas: Earth's large-scale systems interactions and the roles of water in Earth's surface processes. Students make sense of how Earth's geosystems operate by modeling the flow of energy and cycling of matter within and among different systems. A systems approach is also important here, examining the feedback between systems as energy from the Sun is transferred between systems and circulates though the ocean and atmosphere. The crosscutting concepts of cause and effect, systems and system models, and energy and matter are called out as frameworks for understanding the disciplinary core ideas. In this unit, students are expected to demonstrate proficiency in developing and using models and planning and carrying out investigations as they make sense of the disciplinary core ideas. Students are also expected to use these practices to demonstrate understanding of the core ideas.

Standards: (MS-ESS2-4)
Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. (MS-ESS3-3)

Instructional Days: 25-30

HMH Science Dimensions Program Resources Module E

Unit 1: Circulation of Earth's Air and Water

Unit Video: (a man kiteboarding); Why it Matters p. 2; Unit Starter p. 3; Vocabulary p. 3G; Unit Project p.3I; Unit Connections p. 68; Unit Review pp. 69-72; Unit Performance Task pp. 73-74

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.

Lesson 1: Circulation in Earth's Atmosphere pp. 4-23

D/P – WIM Questions p. 2

D/P- CYEI (digital picture) How is it possible for dust and other particles from the Sahara to end up in the Amazon? p. 5

P- ENB (prompt)Students gather evidence to help

Lesson 2: Circulation in Earth's Oceans pp. 24-45

D/P – WIM Questions p. 2

D/P- CYEI (digital picture) Why does floating garbage tend to build up in certain places in the ocean? p. 25

P- ENB (prompt) Students gather evidence to help explain how floating garbage could build up in **Lesson 3:** The Water Cycle pp. 46-67

D/P – WIM Questions p. 2

D/P- CYEI (digital pictures) How could the water molecules in a dinosaur's drink end up in a raindrop that falls from the sky today? 47

P- ENB (prompt) Students gather evidence to show

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Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. (MS-ESS3-4) Construct an argument supported by evidence for how increases in human population and per capita consumption of natural resources impact Earth's systems. (MS-ETS1-1) Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. (MS-ETS1-2) Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. (MS-ETS1-3) Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. (MS-ETS1-4)

explain how dust and other particles can travel so far. p. 5 D/P- HOL Activity Model the Formation of Wind (Students use a physical model to explain how differences in air pressure form wind.) pp. 7-8 D/P- Convection (Students watch video to learn more about convection.) p. 9 P- ENGIT Students identify the different factors an engineer needs to consider when designing a heating/cooling system for a home in a cooler climate versus a home in a warmer climate. p. 9 D/P- The Effect of Earth's Rotation (Students work with a partner to develop and use a different physical model to show how Earth's rotation affects matter in the atmosphere.) p. 11 P- LS Students use evidence from their model to make a claim about how Earth's rotation affects matter in the atmosphere. p. 11

certain areas of the ocean. p. 25 D/P- Patterns in the Ocean (Students watch video to see flow of ocean water.) p. 26 P- ENB (prompt) Think about how ocean surface currents could affect floating garbage. Students record evidence. p. 29 D/P- Hot and Cold Water: Mixing Hot and Cold Water (Students watch video of cold water and warm water coming into contact.) p. 30 D/P- HOL Explore Density Differences in Water (Students carry out an experiment to see why sometimes water move relative to water nearby and sometimes it does not.) pp. 31-32 D/P- DTM Analyze Water **Density Data (Students** analyze data in graphs to discover relationships between variables.) p. 33 D/P- ENGIT (Students study ways in which a hot water outlet pipe can be

how water in a dinosaur's drink could end up in a raindrop today. p. 47 P- ENB (prompt) Think back to the dinosaur's drinking water. Was this water always in the liquid state? Did it remain in a liquid state after the dinosaur drank it? Record evidence. p. 49 D/P- DTM Analyze Temperatures (Students evaluate expressions at specific values and perform arithmetic operations.) p. 50 P- ENB (prompt) Through what processes might the water have changed and moved before and after the dinosaur drank it? p. 52 D/P- HOL Activity Model the Formation of Clouds and Rain (Students develop models to learn more about Earth's atmosphere and use models to study the processes of condensation and precipitation.) p. 53

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Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved. (MS-ESS2-6) Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

Objective 1: Students will: Explain how a water molecule's structure is related to its properties. Locate water sources on Earth. Explain and model how water moves through the water cycle.

Objective 2: Students will: Analyze water supply and demand. Evaluate water conservation strategies. Identify factors that affect water quality. Identify sources of water pollution and propose solutions. Model solutions for meeting the demand for fresh water.

Objective 3: Students will: Model how differences in ocean salinity and temperature affect ocean currents.

Topic 1: Properties of Water; Water Cycle; and Twenty-First Century Themes and Skills (TFCTS) to include: The Four C's, Life and Career Skills, Global Awareness and Environmental Literacy

P- ENB (prompt) How might the global winds contribute to the movement of dust from the Sahara to the Amazon? p. 14
D/P- DTM Compare the Hemispheres p. 14
P- ENB (prompt) How might the cycling of matter in Earth's atmosphere be related to the movement of dust from the Sahara to the Amazon? p. 16

D/P- TIF (enrich) Jet Streams pp. 19-20 D- Hands-On Labs; Farming for Energy; Propose Your Own Path

D/P- Lesson Self Check pp. 21-23 D- Lesson Quiz

D- Make Your Own Study Guide

P- Extension p. 3G P- COLLAB p. 3H P- Connections to Other Disciplines p. 3H

P-DI (ELL/RTI) p. 3G

positioned to optimize the design of a water heater.) p. 35 P- LS (Using the diagram and what they have read, students describe the path of a water molecule in a convection current in the ocean.) p. 37 P- ENB (prompt) How might the cycling of matter in the ocean be related to the buildup of floating garbage in certain parts of the ocean? Why might some garbage float and not sink? p. 39

D/P- TIF (enrich) Careers in Science: Physical Oceanographer pp. 41-42 D- Hands-On Lab; Upwelling in Earth's Oceans; Propose Your Own Path

D/P- Lesson Self Check pp. 43-45 D- Lesson Quiz D- Make Your Own Study Guide

D/P- Water Movement on and Below Earth's Surface (Students watch animation to discover more about the process of water flowing over Earth's surface.) p. 57 P- ENGIT (Students study ways in which dams control the movement of water in order to harvest energy.) p. 57 P- ENB (prompt) How could a water molecule be transferred and transformed through the water cycle over millions of years? p. 62 D/P- TIF (enrich) Careers in Science: Hydrologist pp. 63-64 D- Hands-On Labs; **Investigating Water** Sources; Propose Your Own Path

D/P- Lesson Self Check pp. 65-67 D- Lesson Quiz D- Make Your Own Study Guide

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		P- DI (ELL/RTI) p. 3G	P- DI (ELL/RTI) p. 3G
Topic 2: Freshwater Resources and TFCTS	D- Science Safety HB	P- Extension p. 3G	P- Extension p. 3G
	D- CCC-HB	P- COLLAB p. 3H	P- COLLAB p. 3H
Topic 3: Ocean Salinity Ocean Currents and TFCTS	D- ELA-HB	P- Connections to Other	P- Connections to Other
	D- Math-HB	Disciplines p. 3H	Disciplines p. 3H
Essential Questions: What are the processes	D- SEP-HB		
involved in the cycling of water through Earth's	D- ScienceSaurus	D- Science Safety HB	D- Science Safety HB
systems? How do people use Earth's water	Reference HB	D- CCC-HB	D- CCC-HB
supply? How do ocean currents form and affect		D- ELA-HB	D- ELA-HB
climate?	D- VL Investigating the	D- Math-HB	D- Math-HB
	Carbon Cycle	D- SEP-HB	D- SEP-HB
		D- ScienceSaurus	D- ScienceSaurus
		Reference HB	Reference HB
		D- VL Ocean Currents	D- VBP Got Water?
			D- VL How Does Water
			Move Through the Water
			Cycle?

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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.	
ССС-НВ	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)	Differentiated Instruction (English Language		
Extension	Learner/Response to Intervention)	A page that lists all learning activities used to	
COLLAB	Collaboration	differentiate learning, engage students in collaborative	
Connections	Connections to Other Disciplines	activities and connect learning to other subjects.	
to Other			
Disciplines			
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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М-НВ	Math Handbook	Students who need extra support in grasping concepts or to refresh student knowledge of skills.
Р	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.