EPSD Curriculum and

HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

GRADE 4

EPSD Unit 6: Force in Motion Third Marking Period

Overview: In this unit of study, students are able to use evidence to construct an explanation of the relationship between the speed of an object and the energy of that object and are expected to develop an understanding that energy can be transferred from object to object through collisions. The crosscutting concept of energy and matter is called out as an organizing concept. Students are expected to demonstrate grade-appropriate proficiency in asking questions, defining problems, and constructing explanations, and designing solutions. Students are also expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 4-PS3-1 and 4-PS3-3.

evidence to construct an explanation relating the speed of an object to the energy of that object. (4-PS3-3) Ask questions and predict outcomes about the changes in energy that occurs when objects collide.

Instructional Days: 15

Objective 1: Students will build a spool racer to experiment with potential and kinetic energy.

HMH Science Dimensions Program Resources

Unit 2: Energy

Unit Video (bumper cars); Unit Overview p. 65; Vocabulary p. 67; Making Connections p. 67H; Unit Project p. 67I; Unit Performance Task p. 136-137; Unit Review pp. 138-140

Standard for all Units: Interactive Glossary (D); Leveled Readers (D); Beginning-of-Year Test (D/P); Unit Pretest (D/P); Lesson Quizzes (D/P); Unit Test (D/P)

Note: Refer to the Curriculum Alignment Common Language (CACL) Guide to decipher acronyms.

Lesson 1: What Is Energy? pp. 68-87

D/P- CYEI (video) Heavy train moving across tracks. p. 69

ENB (prompt) Where did the energy come from to make the heavy train speed along the track? When the train stopped, where did the energy go? p. 69 P- LS Cause and Effect (Students choose one **Lesson 2:** How Is Energy Transferred? pp. 88-113

D/P- CYEI (video)
Jackhammer transferring energy. p. 89

ENB (prompt) What is the difference between the sounds in the photo (refer to eBook or p. 89)? What makes each sound loud or soft? Explain how energy transfer from loud sounds

Lesson 3: How Do Collisions Show Energy? pp. 114-135

D/P- CYEI (video) Pool table showing the cue ball hitting the group of balls. p. 115

ENB (prompts) When one ball hits a group of balls, what do you think will happen to the cue ball? What about the balls that were racked up at the

EPSD Curriculum and

HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

Objective 2: Students will work with pennies to develop questions and predict what happens when objects collide.

Objective 3: Students will work with various materials to make observations that speed is related to the amount of energy in an object.

Objective 4: Students will work with various materials to create and answer questions about what happens with energy when objects collide

Objective 5: Students will make observations that speed is related to the amount of energy in an object.

Topics: Force and Motion

Twenty-First Century Themes and Skills include: Environmental Literacy • The Four C's • Global Awareness

Essential Questions: What is the relationship between the speed of an object and its energy? In what ways does energy change when objects collide?

energy example from eBook or p. 71 and describe the effect the energy causes.) p. 71 P- AWYK HO Activity Energy Near You (Students

P- AWYK HO Activity
Energy Near You (Students find examples of energy in the classroom and group them buy the kind of energy they show) p. 71

P- ENGIT Energy from Algae (Students explain how algae farming can help make air quality better.) p. 73 D/P- Forms of Energy p. 73

D/P- DTM Calculate Energy Units p. 75

P- AWYK HO Activity Testing, Testing (Students design a way to test whether the battery still works.) p. 75

D- Batteries and Energy Output

P- AWYK HO Activity Light the Bulb p. 76-77

P- LS Forming an
Explanation (Students
describe the energy
transformation that occurs
with an everyday task such
as listening to the radio and

is different from soft sounds. p. 89 D/P- Differences in Degrees p. 91 ENB (prompt) What evidence have you gathered so far to help explain how sound energy is transferred? p. 93 D/P- LS Heat Transfer without Touch (Students complete the chart by writing the cause and effect from each example.) p. 93 P- ENGIT Thermal Imaging p. 94 P- ENB (prompt) What evidence do you (student) have that visible light is P- LS Energy Experience

evidence do you (student) have that visible light is made of all colors. p. 97 P- LS Energy Experience (Students use evidence as they recall experiences with different types of energy waves, and respond to the following questions: Which of the energy waves shown on p. 97 have you experienced? What evidence do you have of

other end of the table? p. 115

D/P- Energy and Things That Move (video)! pp. 116-117

P- AWYK HO Activity Bang a Gong (Students gather materials to experiment with what is seen in the picture on p. 118, slow-moving ball striking gong) p. 118 P- AWYK HO Activity Flour Power (Students will conduct experiment activity on p. 121 and change one thing they saw. Students will repeat experiment and record results. Students will respond to the following questions: How were the results the same, and how were they different? What does this show about the relationship between speed and energy?) pp. 120-121

P- ENB (prompts) What would happen to the flour if the balls were heavier? If the balls were lighter?

EPSD Curriculum and

HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

draw a diagram to match their description.) p. 79
P- ENB (prompt) When the bell rings signaling the end of class, what evidence would you say proves that energy has been transferred?) p. 79
D/P- LS Conduct Research to determine how electrical energy can transform and list the types of ways. p. 81

D/P- TIF (enrich) People in Science & Engineering: Mayra Artiles, Car Engineer; Dr. Marcus Lehmann, Ocean Engineer pp. 83-84 D- Vampire Appliances D- Potato Power

D/P- Lesson Check pp. 85-86

D/P- Lesson Roundup p. 87 D- Lesson Quiz

P- DI (ELL/RTI) p. 67G P-Extension p. 67G P- COLLAB p. 67H P- Making Connections p. 67H

D- Science Safety HB

each type of energy?) p. 97 P- AWYK HO Activity Design and Test a Solar Cooker pp. 99-101 P- ENB (prompt) Use information on p. 102 to explain how a loud sound is different from a soft sound. p. 102 D/P- Explore the roles of speakers in transferring sound. p. 103 P- AWYK HO Activity Make Vibrations p. 103 D/P- DTM Compare the Speed of Sound p. 106 P- AWYK HO Activity Tune In p. 107 D/P- Explore how tuning forks work. p. 107

D/P- TIF (enrich) Careers in Science & Engineering: HVAC Tech pp. 109-110 D- Keep it Cold D- The Paynes and Fast-Traveling Whale Songs

D/P- Lesson Check pp. 111-112 D/P- Lesson Roundup p. 113 P- LS Cause and Effect: Explain how weight can affect collisions. p. 120 P- AWYK HO Activity Test It! Stored Energy in a Rubber Band pp. 122-124 P- CER Students work with a partner to critique each other's claims and evidence in Step 7 of the HO Activity. p. 124 P- ENGIT Shocking (Students describe what it would feel like to ride on a bumpy path in a car that did not have springs to absorb energy.) p. 127 P- LS Recall from **Experience (Students** consider examples they have seen thus far, and identify another object that is able to absorb and store energy, and is useful.) p. 127 P- LS Cause and Effect (Students describe what happens to the other balls that are cued up when the cue ball hits them) p. 128 P- ENB (prompt) List examples of collisions that are seen every day. p. 128

	D-SEP-HB D- ScienceSarurs Reference HB
	D- YSI Simulation Crash Course

Curriculum Alignment Common Language (CACL) Guide K-5

Acronym	Word/Phrase	Description
AWYK	Apply What You Know	Hands on opportunities for students to apply learning.
CER	Claims Evidence Reasoning	Students make a claim and gather evidence along the way (during EXPLORATORY activities) to support claim.
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 Science	Differentiated Instruction (English Language Learner/Response to Intervention) Collaboration Connections to Science	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 (prompt)	Student notebook or journal used to gather evidence during EXPLORATORY learning activities to support their claims.	
ENGIT	Engineer It	Integrated subject learning.	
НВ	Handbooks		
ССС-НВ	Crosscutting Concepts	Students who need extra support in grasping concepts or to refresh student knowledge of skills.	
ELA-HB	English Language Arts		
М-НВ	Math		
SEP-HB	Science and Engineering Practices		
НО	Hands-On (Activity)	Student collaboration activities.	
LS	Language Smarts	Integrated subject learning.	
Р	Print	Program resources and features in print form.	
TIF	Take It Further (enrich)	Enrichment activities for students in print or digital.	

YSI	You Solve It (Simulation)	Open-ended simulation-based learning with multiple
		answer options.