GRADE 3

EPSD Unit 2: Force and Motion (Part II) Second Marking Period

Overview: During this unit of study, students are able to determine the effects of balanced and unbalanced forces on the motion of an object. The crosscutting concepts of patterns and cause and effect are identified as organizing concepts for these disciplinary core ideas. In the third-grade performance expectations, students are expected to demonstrate grade-appropriate proficiency by planning and carrying out investigations. Students are expected to use these practices to demonstrate understanding of the core ideas. This unit is based on 3-PS2-1 and 3-PS2-2.

Standards: (3-PS2-1) Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object. (3-PS2-2) Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.

Instructional Days: 15-20

HMH Science Dimensions Program Resources

Unit 3: Motion

Unit Video (motion of a pinball machine); Unit Overview p. 135; Vocabulary p. 137; Making Connections p. 137H; Unit Project p. 137I; Unit Performance Task pp. 176-177; Unit Review pp. 178-180

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 Motion? pp. 138-157

D/P- CYEI (video) The Bloodhound SSC car p. 139

P- ENB (prompt) What forces act on the Bloodhound SSC car to make it speed up or slow down? Are forces different at super-high speeds than at slow speeds? p. 139

P- ENB (prompt) Students use position words (i.e., north, south, east, west, next to, behind, and in front of) to describe

Lesson 2: What are Some Patterns in Motion? pp. 158-175

D/P- CYEI (videos) Types of motion at a carnival p. 159

P- ENB (prompt) Students think about the carnival games and identify the motion they can predict in each game and the motion they cannot predict in each game p. 159

D/P- Back and Forth, Up and Down (Students watch videos to discover more

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Objective 1: Students will investigate the effects of balanced and unbalanced forces on a ball.

Objective 2: Using observation skills and data analysis, students will investigate what causes objects to move and/or move farther than others.

Objective 3: Conduct an investigation collaboratively on the effect of force applied on an object to produce data to serve as the basis for evidence, by using fair tests in which variables are controlled and the number of trials is considered.

Objective 4: Students will work in small groups to design a robotic arm to lift a cup off a table.

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

Essential Questions: What must be known about a force to predict how it will change an object's motion? How does applying a force affect the way an object moves?

their position in the classroom and their position in the school; students write their explanation in their ENB. p. 140 D/P- Here or There: Shark on the Move (Students go online to complete an interactive tracking activity.) p. 141 D/P- Moving or Still (Student watch the time-lapse video of the balloon race to see a change in position.) p. 142 P- AWYK Frame of Reference Flipbook (Students make a flipbook that shows a stick person moving past a tree; students share their flipbook with a classmate.) p. 142

D/P- LS Cite Evidence to Explain (Using the Boat Race pictures on page 143, students identify which boat had the fastest motion from start to finish and which boat moved the slowest; students write and explain their responses.) p. 143 D/P- DTM Animals Off to the Races (Students watch video and note how far each animal travels at 10 seconds and at 15 seconds: students use observations to complete the chart.) pp. 144-145 D/P- LS (Students explain how two cars traveling to the same place and at the same speed could get there at different times.) pp. 146-147 D/P- Speed and Unbalanced Forces (Students watch video of a dirt bike to learn more about forces and motion) p.

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about patterns and ways to move.) pp. 160-163

P- ENB (prompt) Student think of objects that can move in more than one way and describe how they move; students write thoughts in their ENB. p. 161

P- AWYK Engineering Motion (Students think about materials they could use to make a path for a marble to roll along; students design a path to make a marble move in several different patterns and make a detailed drawing or model of their design.) p. 163

D/P- LS Students identify what happens when they roll a ball down a hill and when they roll a ball up a hill. p. 163 D/P- How Will It Move (Students watch each video and predict what will happen with the motion of each object; students also continue to explore online to learn more about predictions) pp. 164-165 D/P- LS Students think about some predictable motion in games and sports and write an example of a way that predicting motion can help them win a game. p. 165

D/P- ENGIT Engineering Art in Motion (Students watch video of a Strandbeest in motion and read text on page 166 or in their eBook to answer the question.) p. 166

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D/P- ENGIT Going Even Faster (Students read text on page 149 or in their eBook and respond to the following question: What is the Bloodhound SSC team likely to do with the information they gather from the laser survey?)

D/P- HO Activity Slow Walk, Fast Walk (Students collaborate with a team to measure and describe walking speed.) pp. 150-151

P- CER Students work with a partner to critique each other's claims in step 10 and the evidence they used to arrive at their conclusions. p. 152

D/P- TIF (enrich) People in Engineering: Mark Fuller and Megan Leftwich pp. 153-154

D- Movie Making

D- Robots Race

D/P- Lesson Check pp. 155-156 D/P- Lesson Roundup p. 157

D- Lesson Quiz

P- DI (ELL/RTI) p. 137G

P-Extension p. 137G

P-COLLAB p. 137H

P- Making Connections p. 137H

D- Science Safety HB

D- CCC-HB

D- ELA-HB

D- M- HB

D/P- Motion Inside Motion (Students watch video to discover more about patterns of motion in pendulums.) p. 167 D/P- HO Activity Tick Tock (Students collaborate to investigate variables in pendulums.) pp. 168-170 P- CER Students pair up and critique each

other's claims and evidence from the HO Activity. p. 170

D/P- TIF (enrich) Careers in Science and Engineering: Biomechanist pp. 171-172 D- Where Does Earth Go Everywhere?

D- Well-Oiled Machines

D/P- Lesson Check pp. 173-174

D/P- Lesson Roundup p. 175

D- Lesson Quiz

P- DI (ELL/RTI) p. 137G

P-Extension p. 137G

P- COLLAB p. 137H

P- Making Connections p. 137H

D- Science Safety HB

D- CCC-HB

D- ELA-HB

D- M- HB

D- SEP - HB

D- ScienceSarurs Reference HB

D- YSI Simulation Patterns of Motion

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D- SEP - HB	
D- ScienceSarurs Reference I	4

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.

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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
ELA-HB	English Language Arts	or to refresh student knowledge of skills.
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.