

# EPSD Curriculum and HMH SCIENCE DIMENSIONS 2018 Alignment TEMPLATE

## GRADE Kindergarten

### Unit 2: Forces and Motion

#### Marking Period:

#### NGSS Overview:

The performance expectations in kindergarten help students formulate answers to questions such as: “What happens if you push or pull an object harder? Where do animals live and why do they live there? What is the weather like today and how is it different from yesterday?” Kindergarten performance expectations include PS2, PS3, LS1, ESS2, ESS3, and ETS1.

With the Disciplinary Core Ideas, students are expected to develop understanding of patterns and variations in local weather and the purpose of weather forecasting to prepare for, and respond to, severe weather. Students are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. Students are also expected to develop understanding of what plants and animals (including humans) need to survive and the relationship between their needs and where they live.

The crosscutting concepts of patterns; cause and effect; systems and system models; interdependence of science, engineering, and technology; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas. In the kindergarten performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

#### Performance Expectations:

**PS2-1:** Plan and conduct an investigation to compare the effects of different strengths or

#### HMH Science Dimensions Program Resources

#### Unit 2: Forces and Motion

**Unit Video** (a marble rolling); **Unit Overview** p. 37; **Vocabulary** p. 39; **Connecting with NGSS** 39H; **Unit Project** 39I; **Unit Performance Task** pp. 66-67; **Unit Review** pp. 68-70

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<p>different directions of pushes and pulls in the motion of an object.</p> <p><b>PS2-2:</b> Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or pull.</p>	<p><b>Standard for all Units:</b> Interactive Glossary (D); Leveled Readers (D); Beginning-of-Year Test (D/P); Unit Pretest (D/P); Lesson Quizzes (D); Unit Review (D/P); Unit Test (D/P)</p> <p><b>Note:</b> Refer to the Curriculum Alignment Common Language (CACL) Guide to decipher acronyms.</p>	
<p><b>Objectives:</b></p> <p><b>Lesson 1:</b> Plan and conduct an investigation to determine how changing the speed or direction of an object can affect its motion.</p> <p><b>Lesson 2:</b> Collect and analyze data to determine if a design solution works to change an object's speed or direction with a push or a pull.</p>	<p><b>Lesson 1:</b> Engineer It: What Is Motion? pp. 40-53</p> <p>D/P- CYEI (video) Pushes and Pulls (rap included). p. 41</p> <p>D/P- CYEI Think about pushes and pulls. How do they move things differently? p. 41</p> <p>D/P- Motion (Students view video to explore more about motion.) pp. 42-43</p> <p>D/P- AWYK (ENB) Students identify all pictures that show something being pushed. Find something that is moving. Use evidence to explain how it is moving. p. 43</p> <p>D/P- Speed (Students view video to find out more about speed.) p. 44</p> <p>D/P- AWYK HO Activity Engineer It: Make a Ramp pp. 45-46</p>	<p><b>Lesson 2:</b> Engineer It: How Can We Change the Way Things Move? pp. 54-65</p> <p>D/P- CYEI (video) Change Direction and Speed. p. 55</p> <p>D/P- CYEI Think about how a ball moves when it has been kicked. Does it go faster or slower? In what direction does it move? p. 55</p> <p>D/P- Changing Speed (Students view video to explore more about the effect of strong and weak forces.) p. 55</p> <p>D/P- AWYK Students identify pictures of someone using a force to make the ball move fast. Students take turns kicking a ball hard and then softly to a partner. Talk about how the different kicks affect the speed of the ball. p. 56</p>
<p><b>Instructional Days:</b> 12 Days for Core; 24 Days for Comprehensive</p>		
<p><b>Unit Project:</b> A Game of Motion</p> <p>How can you score points with a push? Can you think of two games you could design and build?</p>		

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<p><b>Unit Vocabulary:</b></p> <p>motion speed direction force</p>	<p>P- CER Using the AWKK HO Activity, students should cite evidence that the location of the masking tape for the test of the steeper ramp showed that the car traveled farther. p. 46</p> <p>D/P- Direction (Students view video to explore more about the directions objects move.) pp. 47-48</p> <p>P- AWYK HO Activity Students draw a line from each picture to an arrow that shows the direction. Play “Follow the Leader.” The leader will take the group in different directions. p. 48</p> <p>D/P- TIF (enrich) People in Science and Engineering: Isaac Newton; Friction pp. 49-50</p> <p>D/P- Lesson Check p. 51</p> <p>D/P- Self Check pp. 52-53</p> <p>D- Lesson Quiz</p> <p>P- DI (ELL/RTI) p. 39G</p> <p>P-Extension p. 39G</p> <p>P- COLLAB p. 39H</p> <p>P- Connecting with NGSS p. 39H</p> <p>D- Science Safety HB</p> <p>D- ELA- HB</p> <p>D- ScienceSarurs Reference HB</p>	<p>D/P- Changing Direction (Students view video to explore more about how forces can change the direction objects move.) p. 57</p> <p>P- AWYK (ENB) Students identify the pictures of someone using a force to change the direction the ball is moving. List more ways to change the direction of an object. Talk about cause and effect. Use evidence to support ideas. p. 57</p> <p>D/P- Bumping (Students view video to explore more about how the push of objects colliding can change their direction.) p. 58</p> <p>P- AWYK Students identify the objects changing direction because they are being bumped. Talk about how one marble hitting another marble affects its speed and direction. p. 58</p> <p>P- DTM Students work in small groups to compare a large and small marble. Teacher and students then discuss what happens when both marbles collide. Does size affect their speed and direction? p. 58</p> <p>D/P- HO Activity Engineer It: Pushing Objects (Students watch video of the steps for this HO Activity and work with a partner to conduct activity; pause the video after each step.) pp. 59-60</p>
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	D- YSI Simulation Rolling Maze	<p>P- CER Students make a claim and cite evidence for the HO Activity, Engineer It: Pushing Objects. Students should claim that when objects collide, their speed and direction change.) p. 60</p> <p>D/P- TIF (enrich) Careers in Science and Engineering: Roller Coaster Designer; Balloon Rocket Racers pp. 61-62</p> <p>D/P- Lesson Check p. 63 D/P- Self Check pp. 64-65 D- Lesson Quiz</p> <p>P- DI (ELL/RTI) p. 39G P-Extension p. 39G P- COLLAB p. 39H P- Connecting with NGSS p. 39H</p> <p>D- Science Safety HB D- ELA- HB D- Math- HB D- SEP- HB D- ScienceSarurs Reference HB</p>
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Curriculum Alignment Common Language (CACL) Guide K-5		
Acronym	Word/Phrase	Description
<b>AWYK</b>	Apply What You Know	Hands on opportunities for students to apply learning.
<b>CER</b>	Claims Evidence Reasoning	Students make a claim and gather evidence along the way (during EXPLORATORY activities) to support claim.
<b>CYEI</b>	Can You Explain It	Lesson phenomenon used to ENGAGE students in learning at the beginning of the lesson.
<b>CYSI</b>	Can You Solve It	Lesson phenomenon used to ENGAGE students in learning at the beginning of the lesson.
<b>D</b>	Digital	Program resources and features in interactive digital form.
<b>DI (ELL/RTI) Extension COLLAB Connections to Science</b>	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.
<b>DTM</b>	Do the Math	Integrated subject learning.
<b>ENB</b>	Evidence Notebook (prompt)	Student notebook or journal used to gather evidence during EXPLORATORY learning activities to support their claims.
<b>ENGIT</b>	Engineer It	Integrated subject learning.

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<b>HB</b> <b>CCC-HB</b> <b>ELA-HB</b> <b>M-HB</b> <b>SEP-HB</b>	Handbooks Crosscutting Concepts English Language Arts Math Science and Engineering Practices	Students who need extra support in grasping concepts or to refresh student knowledge of skills.
<b>HO</b>	Hands-On (Activity)	Student collaboration activities.
<b>LS</b>	Language Smarts	Integrated subject learning.
<b>P</b>	Print	Program resources and features in print form.
<b>TIF</b>	Take It Further (enrich)	Enrichment activities for students in print or digital.
<b>YSI</b>	You Solve It (Simulation)	Open-ended simulation-based learning with multiple answer options.