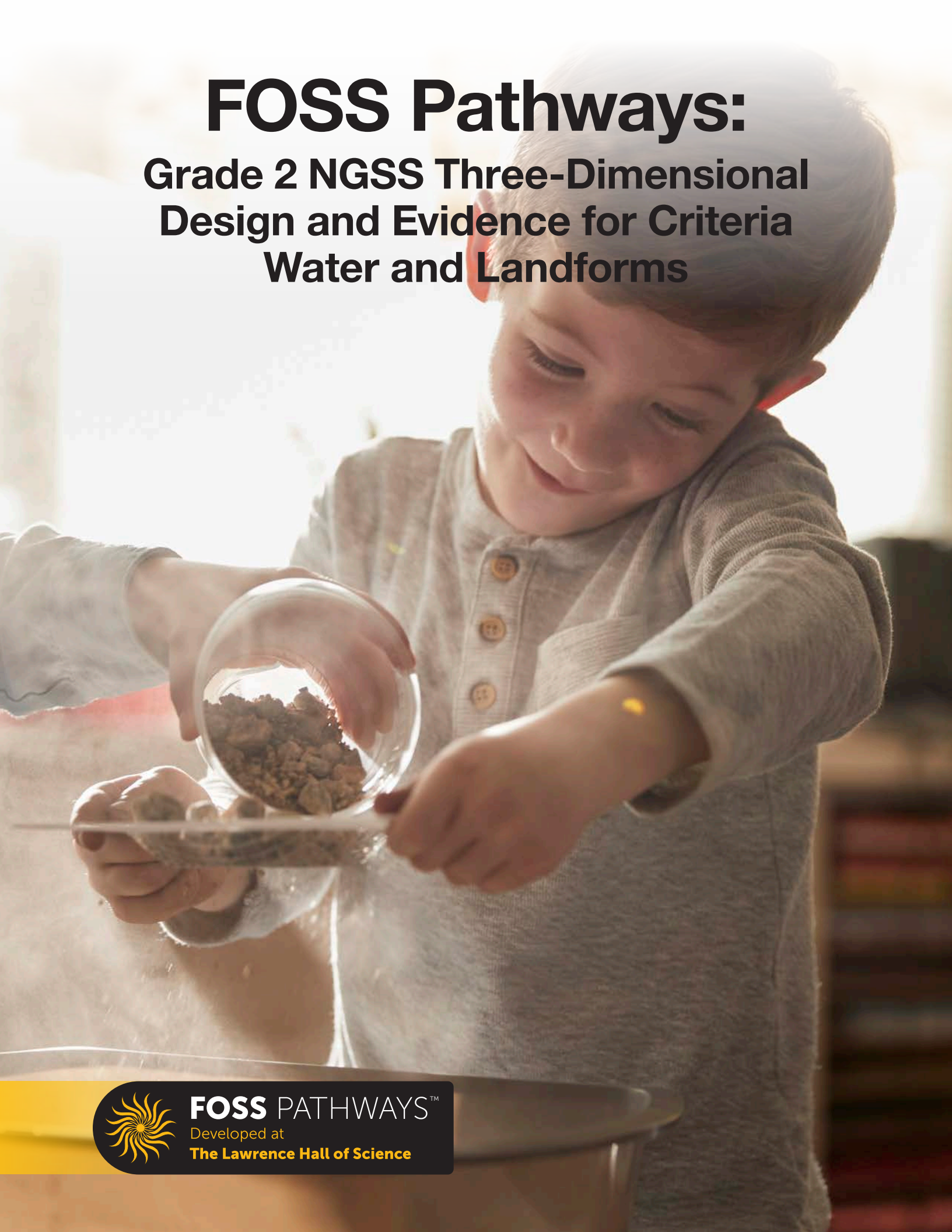


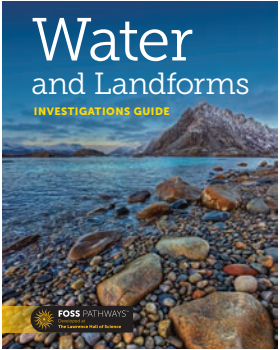
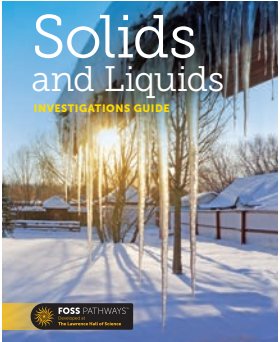
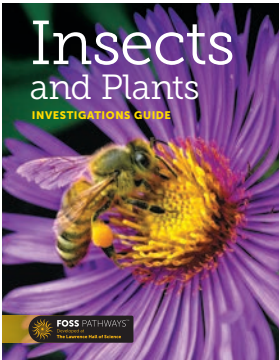
FOSS Pathways:

Grade 2 NGSS Three-Dimensional Design and Evidence for Criteria Water and Landforms



FOSS Pathways Modules Grade 2

Alignment to NGSS

FOSS Module	Module Overview/Bundled Performance Expectations	Disciplinary Core Ideas	Science and Engineering Practices	Crosscutting Concepts
<div></div> <div>Earth Science</div>	<p>The Water and Landforms Module provides experiences with Earth’s natural resources—rocks, soil, and water—and provides opportunities for students to engage in science and engineering practices. Students explore the natural world by using simple tools to observe and describe the properties of earth materials.</p> <p>NGSS PEs: Earth and Physical Sciences: 2-ESS1-1 2-ESS2-1 2-ESS2-2 2-ESS2-3 2-PS1-1 ETAS: K-2-ETS1-3</p>	<p>ESS1.C: The history of planet Earth ESS2.A: Earth materials and systems ESS2.B: Plate tectonics and large-scale system interactions ESS2.C: The roles of water in Earth’s surface processes PS1.A: Structures and properties of matter ETS1.C: Optimizing the design solution</p>	<ul style="list-style-type: none">• Asking questions• Planning and carrying out investigations• Analyzing and interpreting data• Constructing explanations• Obtaining, evaluating, and communicating information	<ul style="list-style-type: none">• Patterns• Cause and effect• Stability and change• Scale, proportion, and quantity
<div></div> <div>Physical Science</div>	<p>In the Solids and Liquids Module, students observe, describe, and compare properties of common solids and liquids through firsthand experience. They plan and carry out investigations to find out what happens when solids and water are mixed and when liquids and water are mixed. They gain firsthand experience with reversible and irreversible changes caused by heating or cooling, and then expand their data collection through a simulation. They use evidence to engage in argumentation and support claims about reversible and irreversible changes to materials due to temperature changes.</p> <p>NGSS PEs: Physical Sciences: 2-PS1-1 2-PS1-2 2-PS1-3 2-PS1-4 ETAS: K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3</p>	<p>PS1.A: Structure and properties of matter PS1.B: Chemical reactions ETS1.A: Defining and delimiting an engineering problem ETS1.B: Developing possible solutions ETS1.C: Optimizing the design solution</p>	<ul style="list-style-type: none">• Asking questions and defining problems• Developing and using models• Planning and carrying out investigations• Analyzing and interpreting data• Constructing explanations and designing solutions• Obtaining, evaluating, and communicating information• Using mathematics and computational thinking	<ul style="list-style-type: none">• Patterns• Cause and effect• Energy and matter• Structure and function• Scale, proportion, and quantity
<div></div> <div>Life Science</div>	<p>The Insects and Plants Module builds understanding of growth and development of plants by observing new organisms over time. Students see the life cycles of insects unfold in real time and compare the structures and functions exhibited by each species to reveal patterns. At the same time, they grow a flowering plant in the classroom and gain experience with pollination, seed dispersal, and the ways in which plants and insects interact in feeding relationships.</p> <p>NGSS PEs: Life Sciences: 2-LS2-1 2-LS2-2 2-LS4-1 ETAS: K-2-ETS1-2</p>	<p>LS1.A: Structure and function LS1.B: Growth and development of organisms LS2.A: Independent relationships in ecosystems LS4.D: Biodiversity and humans ETS1.B: Developing possible solutions</p>	<ul style="list-style-type: none">• Asking questions• Developing and using models• Planning and carrying out investigations• Analyzing and interpreting data• Constructing explanations and designing solutions• Obtaining, evaluating, and communicating information• Using mathematics and computational thinking	<ul style="list-style-type: none">• Patterns• Cause and effect• Structure and function• Systems and system models

NGSS 3-D Design Criteria		FOSS Pathways Evidence: Water and Landforms		
Instruction and Assessment	Anchor Phenomena 1 Rocks in a river Investigation 1, Parts 1-2	Anchor Phenomenon 1 Rocks in a river (continued) Anchor Phenomenon 2 Different materials in soil Investigation 2, Parts 1-2	Anchor Phenomenon 3 Reduce soil erosion Investigation 3, Parts 1-2	Anchor Phenomenon 4 Plan for soil erosion study Investigation 4, Parts 1-2
<p>Use Phenomena/Problems</p> <p>Materials provide relevant and authentic learning contexts through which students:</p> <ul style="list-style-type: none">engage as directly as possible with phenomena or problems to ask and answer their questions as well as questions from other sourceshave the potential to use the three dimensions to make sense of phenomena or design solutions to problems	<p>Inv. 1, Parts 1-2</p> <p>Students investigate weathering and classifying rocks through hands-on investigations.</p> <p>Introduce the anchor phenomenon (pg. 40)</p> <p>Students connect to, construct, revise, revisit and review the explanation of phenomenon (pgs. 51, 52, 60 and 69)</p> <p>Students have a sense-making discussion (pgs. 42, 45, 63 and 68)</p>	<p>Inv. 2, Parts 1-2</p> <p>Students explore the connections between rocks and sand, make different soil compositions and prepare to solve the problem of soil erosion.</p> <p>Students construct, revise, revisit and review the explanation of phenomenon (pgs. 82, 87 and 103)</p> <p>Students have a sense-making discussion (pgs. 84 and 101)</p> <p>Students finalize the anchor phenomenon response (pgs.87 and 104)</p> <p>Introduce the anchor phenomenon (pg. 96)</p>	<p>Inv. 3, Parts 1-2</p> <p>Students use what they have learned about soil to make decisions for conducting online tests and collecting data on fast and slow changes to the surface of land.</p> <p>Introduce the problem to solve (pg. 122)</p> <p>Students connect to, construct, revise, revisit and review the explanation of phenomenon and the problem to solve (pgs. 129, 134 and 141)</p> <p>Students have a sense-making discussion (pgs. 127 and 138)</p>	<p>Inv. 4, Parts 1-2</p> <p>Students are asked to help engineers plan for a soil erosion study. Students develop a model of water and land in their community.</p> <p>Introduce the problem to solve (pg. 152)</p> <p>Students connect to, construct, revise, revisit and review the explanation of phenomenon (pgs. 163, 168 and 176)</p> <p>Students have a sense-making discussion (pgs. 158 and 175)</p> <p>Students finalize the class response to the problem (pg. 176)</p>
<p>Presence of Logical Sequence</p> <p>Student learning across the three dimensions is:</p> <ul style="list-style-type: none">arranged in a logical sequencesufficient and appropriate for students to figure out the phenomena or problems	<p>Water and Landforms Module instructs on NGSS Performance Expectation: 2-PS1-1, 2-ESS1-1 (pgs. 2-5)</p> <p>Conceptual Flow of Water and Landforms Module (pgs.6-7)</p> <p>Developing the Phenomenon Storyline of rocks in a river (pg. 31) through investigating</p> <p>Part 1 - Weathering Rocks (pgs. 34-35) Part 2 - Classifying River Rocks by Size (pgs. 54-55)</p>	<p>Water and Landforms Module instructs on NGSS Performance Expectation: 2-PS1-1, 2-ESS1-1 (pgs. 2-5)</p> <p>Conceptual Flow of Water and Landforms Module (pgs. 6-7)</p> <p>Further developing the Phenomenon Storyline of rocks in a river (pg. 73) through investigating</p> <p>Part 1 - Sand and Silt (pgs. 76-77) Part 2 - Homemade Soil (pgs. 90-91)</p>	<p>Water and Landforms Module instructs on NGSS Performance Expectation: 2-ESS1-1, 2-ESS2-1 and K-2-ETS1-3 (pgs. 2-5)</p> <p>Conceptual Flow of Water and Landforms Module (pgs. 6-7)</p> <p>Developing the Phenomenon Storyline of reduce soil erosion (pg. 107) through investigating</p> <p>Part 1 - Erosion (pgs. 110-111) Part 2 - Fast and Slow Earth Events (pgs. 130-131)</p>	<p>Water and Landforms Module instructs on NGSS Performance Expectation: 2-ESS2-2 and 2-ESS2-3 (pgs. 2-5)</p> <p>Conceptual Flow of Water and Landforms Module (pgs. 6-7)</p> <p>Developing the Phenomenon Storyline of plan for soil erosion study (pg. 143) through investigating</p> <p>Part 1 - Natural Sources of Water (pgs. 146-147) Part 2 - Describing Water and Landforms (pgs. 164-165)</p>

Purple = curricular embedded supports Green = ongoing educator and student supports

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Instruction and Assessment	Anchor Phenomena 1 Rocks in a river Investigation 1, Parts 1-2	Anchor Phenomenon 1 Rocks in a river (continued) Anchor Phenomenon 2 Different materials in soil Investigation 2, Parts 1-2	Anchor Phenomenon 3 Reduce soil erosion Investigation 3, Parts 1-2	Anchor Phenomenon 4 Plan for soil erosion study Investigation 4, Parts 1-2
<p>Students are Figuring Out</p> <p>Materials position students to make sense of phenomena and design solutions to problems by:</p> <ul style="list-style-type: none"> • asking and answering questions that link learning over time • using the three dimensions to link prior knowledge and negotiate new understandings and abilities 	<p>Elements of the FOSS Instructional Design Active Investigation - Figuring Out Phenomena (pgs. 12-13)</p> <p>Materials position students to make sense of phenomena and design by eliciting metacognition on the following questions:</p> <ul style="list-style-type: none"> • What happens when rocks rub together and are then placed in water? (pg. 41) • How can rocks be separated by size? (pg. 61) 	<p>Elements of the FOSS Instructional Design Active Investigation - Figuring Out Phenomena (pgs. 12-13)</p> <p>Materials position students to make sense of phenomena and design by eliciting metacognition on the following questions:</p> <ul style="list-style-type: none"> • Is there an earth material smaller than sand? (pg. 84) • What is soil? (pg. 90) 	<p>Elements of the FOSS Instructional Design Active Investigation - Figuring Out Phenomena (pgs. 12-13)</p> <p>Materials position students to make sense of phenomena and design by eliciting metacognition on the following questions:</p> <ul style="list-style-type: none"> • How can soil erosion be reduced? (pg. 122) • Which earth events cause fast changes, and which cause slow changes? (pg. 134) 	<p>Elements of the FOSS Instructional Design Active Investigation - Figuring Out Phenomena (pgs. 12-13)</p> <p>Materials position students to make sense of phenomena and design by eliciting metacognition on the following questions:</p> <ul style="list-style-type: none"> • Where is water found in our community? (pg. 152) • How can we show bodies of water and land formations? (pg. 168)
<p>Three-dimensional Performances</p> <p>Materials include assessments designed to:</p> <ul style="list-style-type: none"> • match the targeted learning goals • elicit evidence of students' use of the three dimensions to make sense of phenomena and/or to design solutions to problems 	<p>Three-dimensional assessment of Performance Expectation PS1.A: Structure and properties of matter, ESS1.C: The history of planet Earth</p> <ul style="list-style-type: none"> • Part 1, Step 20 Assess progress: notebook entry (pg. 46) • Part 2, Step 12 Assess progress: performance assessment (pg. 63) • Part 2, Step 23 Assess progress: I-Check (pg. 70) 	<p>Three-dimensional assessment of Performance Expectation PS1.A: Structure and properties of matter, ESS1.C: The history of planet Earth</p> <ul style="list-style-type: none"> • Part 1, Step 15 Assess progress: notebook entry (pg. 85) • Part 2, Step 9 Assess progress: performance assessment (pg. 98) 	<p>Three-dimensional assessment of Performance Expectation ESS1.C: The history of the planet, ESS2.A: Earth materials and systems, ETS1.C: Optimizing the design solution</p> <ul style="list-style-type: none"> • Part 1, Step 13 Assess progress: performance assessment (pg. 126) • Part 2, Step 9 Assess progress: notebook entry (pg. 139) • Part 2, Step 12 Assess progress: I-Check (pg. 141) 	<p>Three-dimensional assessment of Performance Expectation ESS2.C: The roles of water in Earth's surface processes, ESS2.B: Plate tectonics and large-scale system interactions</p> <ul style="list-style-type: none"> • Part 1, Step 11 Assess progress: notebook entry (pg. 158) • Part 2, Step 5 Assess progress: performance assessment (pg. 174) • Part 2, Step 12 Assess progress: I-Check (pg. 177)

Recommended Scope and Sequence

FOSS Pathways

GRADE	PHYSICAL SCIENCE	EARTH SCIENCE	LIFE SCIENCE
PK	Observing Nature		
K	Materials and Forces	Trees and Weather	Animals Two by Two
1	Sound and Light	Changes in the Sky	Plants and Animals
2	Solids and Liquids	Water and Landforms	Insects and Plants
3	Motion	Water and Climate	Structures of Life
4	Energy	Soils, Rocks, and Landforms	Senses and Survival
5	Mixtures and Solutions	Earth and Sun	Living Systems

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