Second Grade Foss Pacing Guide 2017-2018

Quarter 1	Quarter 2	Quarter 3	Quarter 4
Unit 1 Pebbles, Sand, & Silt **Aug 21 - Oct 20** (approx. 42 days) Investigation 1: First Rocks Investigation 2: River Rocks Investigation 3: Using Rocks Investigation 4: Soil and Water			
	Unit 2: Solids & Liquids **Oct 23 - January 26** (approx. 51 days) Investigation 1: Solids Investigation 2: Liquids Investigation 3: Bits and Pieces Investigation 4: Solids, Liquids, and Water		
		**Unit 3: Insects and plants** **January 29 - May 18** (approx. 75 days) Investigation 2: Brassica Seeds Investigation 3: Milkweed Bugs Investigation 4: Silkworms Investigation 5: Butterflies	

Unit 1 Title: Pebbles, Sand, and Silt
Quarter: 1

Approximate Teaching Dates	(42 Teaching Days) August 21, 2017 through October 20, 2017
Domains	Earth Science (ES); Physical Science (PS); Engineering, Technology, & Applications of Science (ETS)
Performance Expectations	**Students who demonstrate understanding can:** **Earth Science** • **2-ESS1-1.** Use information from several sources to provide evidence that Earth events can occur quickly or slowly. [Clarification Statement: Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.] [Assessment Boundary: Assessment does not include quantitative measurements of timescales.] • **2-ESS2-1.** Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.* [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.] • **2-ESS2-2.** Develop a model to represent the shapes and kinds of land and bodies of water in an area. [Assessment Boundary: Assessment does not include quantitative scaling in models.] • **2-ESS2-3.** Obtain information to identify where water is found on Earth and that it can be solid or liquid. **Physical Science** • **2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.] • **2-PS1-3.** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.] **Engineering, Technology, and Applications of Science** • **K-2-ETS1-1**. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or too. • **K-2-ETS1-2**. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. • **K-2-ETS1-3**. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Science and Engineering Practices	• Asking Questions (for science) and Defining Problems (for engineering) • Developing and Using Models **(I-Check 4)** • Planning and Carrying Out Investigations **(Inv 1. Pt 3; Inv 2, Pt 1; Inv 3, Pt 3; Inv 4, Pt 1; I-Check 1; I-Check 2; I-Check 3; I-Check 4)** • Analyzing and Interpreting Data • Constructing Explanations (for science) and Designing Solutions (for engineering) **(Inv 1. Pt 3; Inv 2, Pt 1; Inv 3, Pt 3; Inv 4, Pt 1)** • Engaging in Argument from Evidence **(Inv 1. Pt 3; Inv 4, Pt 1)** • Obtaining, Evaluating, and Communicating Information
Disciplinary Core Ideas	**Earth Science** • **ESS1.C: The History of Planet Earth** Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe. (2-ESS1-1) **(I-Check 1; I-Check 2)** • **ESS2.A: Earth Materials and Systems** Wind and water can change the shape of the land. (2- ESS2-1) **(I-Check 4)** • **ESS2.B: Plate Tectonics and Large-Scale System Interactions** Maps show where things are located. One can map the shapes and kinds of land and water in any area. (2-ESS2- 2) **(I-Check 4)** • **ESS2.C: The Roles of Water in Earth's Surface Processes** Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. (2-ESS2-3) **(I-Check 4)** **Physical Science** • **PS1.A: Structure and Properties of Matter (I-Check 1; I-Check 2; I-Check 4)** ○ Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) ○ Different properties are suited to different purposes. (2- PS1-2),(2-PS1-3) ○ A great variety of objects can be built up from a small set of pieces. (2-PS1-3) **Engineering, Technology, and Applications of Science** • **ETS1.A: Defining and Delimiting Engineering Problems** ○ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2- ETS1-1) ○ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) ○ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) • **ETS1.B: Developing Possible Solutions** ○ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2) • **ETS1.C: Optimizing the Design Solution (I-Check 3)** ○ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

Cross Cutting Concepts	**Patterns (I-Check 1; I-Check 4)** ● Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. **Cause and Effect (I-Check 1; I-Check 2; I-Check 3)** ● Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering **Scale Proportion & Quantity (Inv 3, Pt 3; I-Check 2)** ● Relative scales allow objects and events to be compared and described. **Energy and Matter in Systems (I-Check 2; I-Check 4)** ● Objects may break into smaller pieces, be put together into larger pieces, or change shapes. **Structure and Function** ● The way an object is shaped or structured determines many of its properties and functions **Stability & Change of Systems (I-Check 2; I-Check 3; I-Check 4)** ● For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand
Required Investigations	**Investigation 1: First Rocks** **Investigation 2: River Rocks** **Investigation 3: Using Rocks** **Investigation 4: Soil and Water**
Required Summative Assessments	**Science and Engineering Practices** • Inv 1, Part 3: performance assessment • Inv 2, Part 1: performance assessment • Inv 3, Part 3: performance assessment • Inv 4, Part 1: performance assessment **Performance Expectations (conceptual understanding)** • Investigation 1 I-Check • Investigation 2 I-Check • Investigation 3 I-Check • Investigation 4 I-Check

Unit 2 Title: Solids and Liquids
Quarters: 2 and 3

Approximate Teaching Dates	(51 Teaching Days) October 23- January 26
Domains	Physical Science (PS) & Engineering, Technology & Applications of Science (ETS)
Performance Expectations	**Students who demonstrate understanding can:** **Physical Science** • **2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. [Clarification Statement: Observations could include color, texture, hardness, and flexibility. Patterns could include the similar properties that different materials share.] • **2-PS1-2.** Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* [Clarification Statement: Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.] [Assessment Boundary: Assessment of quantitative measurements is limited to length.] • **2-PS1-3.** Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object. [Clarification Statement: Examples of pieces could include blocks, building bricks, or other assorted small objects.] • **2-PS1-4**. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot. [Clarification Statement: Examples of reversible changes could include materials such as water and butter at different temperatures. Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.] **Engineering, Technology & Applications of Science** • **K-2-ETS1-1**. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or too. • **K-2-ETS1-2**. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. • **K-2-ETS1-3**. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
Science and Engineering Practices	• Asking Questions (for science) and Defining Problems (for engineering) • Developing and Using Models • Planning and Carrying Out Investigations **(Inv 1, Pt 3; Inv 2, Pt 1; Inv 3, Pt 2; Inv 4 Pt 3; I-Check 1; I-Check 2; I-Check 3; I-Check 4)** • Analyzing and Interpreting Data • Using Mathematics and Computational Thinking • Constructing Explanations (for science) and Designing Solutions (for engineering) **(Inv 1, Pt 3; Inv 1 Pt 4; Inv 3 Pt 2; Inv 3 Pt 3; Inv 4 Pt 3)** • Engaging in Argument from Evidence **(Inv 4 Pt 3; I-Check 4)** • Obtaining, Evaluating, and Communicating Information **(Inv 2, Pt 1; Inv 4 Pt 3)**

Disciplinary Core Ideas	**Physical Science 1 (PS1)** ● **PS1.A: Structure and Properties of Matter** ○ Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. (2-PS1-1) ○ Different properties are suited to different purposes. (2- PS1-2),(2-PS1-3) ○ A great variety of objects can be built up from a small set of pieces. (2-PS1-3) **(I-Check 1, I-Check 2, I-Check 3, I-Check 4)** ● **PS1.B: Chemical Reactions** ○ Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not. (2-PS1-4) **(I-Check 4)** **Engineering, Technology, and Applications of Science (ETS)** ● **ETS1.A: Defining and Delimiting Engineering Problems** ○ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2- ETS1-1) ○ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) ○ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) **(I-Check 3)** ● **ETS1.B: Developing Possible Solutions** ○ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2) ● **ETS1.C: Optimizing the Design Solution** ○ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)

Cross Cutting Concepts	**Patterns (Inv 1, Pt 3)** ● Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. **Cause and Effect** ● Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering **Scale Proportion & Quantity** ● Relative scales allow objects and events to be compared and described. **System and System Models** ● A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems. **Energy and Matter in Systems (I-Check 2; I-Check 3; I-Check 4)** ● Objects may break into smaller pieces, be put together into larger pieces, or change shapes. **Structure and Function (Inv 1 Pt 4; I-Check 1)** ● The way an object is shaped or structured determines many of its properties and functions **Stability & Change of Systems (I-Check 2, I-Check 3; I-Check 4)** ● For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand
Required Investigations	Investigation 1: Solids Investigation 2: Liquids Investigation 3: Bits and Pieces Investigation 4: Solids, Liquids, and Water
Required Summative Assessment(s)	**Science and Engineering Practices** • Inv 1, Part 3: performance assessment • Inv 1, Part 4: performance assessment • Inv 2, Part 1: performance assessment • Inv 3, Part 2: performance assessment • Inv 3, Part 3: performance assessment • Inv 4, Part 3: performance assessment **Performance Expectations (conceptual understanding)** • Investigation 1 I-Check • Investigation 2 I-Check • Investigation 3 I-Check • Investigation 4 I-Check

Unit 3 Title: Insects and Plants Quarters: 3 and 4	
Teaching Dates	(70 days) January 29 to May 18
Domains	Life Science; Engineering, Technology, and Applications of Science
Performance Expectations	**Students who demonstrate understanding can:** **Life Science** **2-LS2-1.** Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.] **2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*** **2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.** [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.] **Engineering, Technology, and Applications of Science** • **K-2-ETS1-1**. Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or too. • **K-2-ETS1-2**. Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. • **K-2-ETS1-3**. Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
Science and Engineering Practices	Asking Questions (for science) and Defining Problems (for engineering) **(Inv 1, Pt 2; Inv 2, Pt 2)** Developing and Using Models **(I-Check 1; I-Check 2; I-Check 5)** Planning and Carrying Out Investigations **(Inv 1, Pt 2; I-Check 2; I-Check 3; I-Check 5)** Using Mathematics and Computational Thinking Analyzing and Interpreting Data **(Inv 2, Pt 2; I-Check 3)** Constructing Explanations (for science) and Designing Solutions (for engineering) **(Inv 1, Pt 2;Inv 2, Pt 2; Inv 4, Pt 4, Inv 5, Pt 1; I-Check 2)** Engaging in Argument from Evidence **(Inv 1, Pt 2; Inv 2, Pt 2; Inv 4, Pt 4; I-Check 2)** Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas	**Life Science** ● **LS1.A: Structure and Function** Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1) **(I-Check 1)** ● **LS1.B: Growth and Development of Organisms** Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1) **(I-Check 1; I-Check 3; I-Check 4; I-Check 5)** ● **LS1.C: Organization for Matter and Energy Flow in Organisms** Plants acquire their material for growth chiefly from air and water. (5-LS1-1) **(I-Check 1; I-Check 2; I-Check 3)** ● **LS2.A: Interdependent Relationships in Ecosystems (I-Check 2; I-Check 5)** ○ Plants depend on water and light to grow. (2-LS2-1) ○ Plants depend on animals for pollination or to move their seeds around. (2-LS2-2) ● **LS4.D: Biodiversity and Humans (I-Check 1; I-Check 2; I-Check 3; I-Check 4; I-Check 5)** ○ There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1) **Engineering, Technology, and Applications of Science** ● **ETS1.A: Defining and Delimiting Engineering Problems** ○ A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2- ETS1-1) ○ Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) ○ Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) ● **ETS1.B: Developing Possible Solutions** ○ Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2) ● **ETS1.C: Optimizing the Design Solution** ○ Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)
Cross Cutting Concepts	**Patterns (Inv 5, Pt 1; I-Check 3; I-Check 4; I-Check 5)** ● Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence. **Cause and Effect** ● Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering **Structure and Function (I-Check 1; I-Check 2; I-Check 3; I-Check 4; I-Check 5)** ● The way an object is shaped or structured determines many of its properties and functions **Stability & Change of Systems** ● For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand
Required	Investigation 1: Mealworms

Investigations	Investigation 2: Brassica Seeds Investigation 3: Milkweed Bugs Investigation 4: Silkworms Investigation 5: Butterflies
Required Summative Assessments	**Science and Engineering Practices** • Inv 1, Part 2: performance assessment • Inv 2, Part 2: performance assessment • Inv 4, Part 4: performance assessment • Inv 5, Part 1: performance assessment **Performance Expectations (conceptual understanding)** • Investigation 1 I-Check • Investigation 2 I-Check • Investigation 3 I-Check • Investigation 4 I-Check