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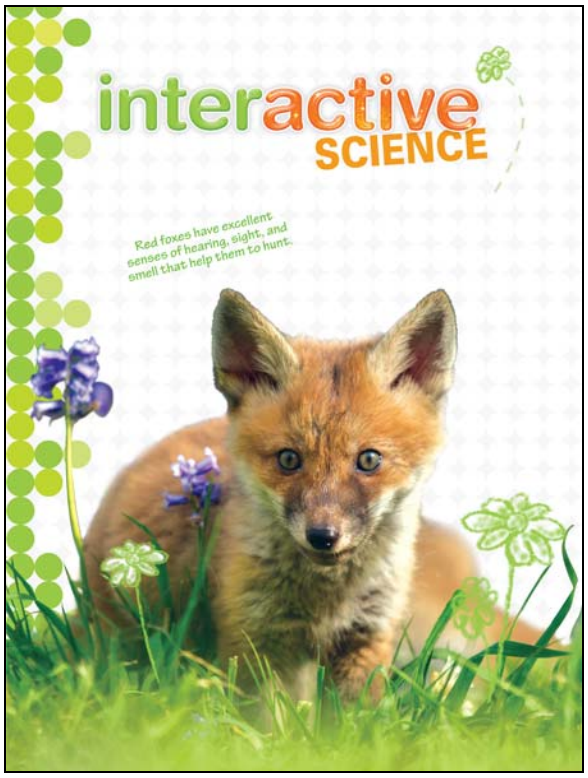

To the

Iowa Core Science Standards
Foundation Boxes and Evidence Statements
Grade 2

Pearson

Introduction

The following document demonstrates how the ***Interactive Science*, *©2016*** program aligns to the Iowa Core Science Standards for grades K-5. Correlation references are to the Student Edition and Teacher Edition. Please note that the Kindergarten Student Edition text pages are two-sided; each singular page contains a corresponding Activity Page on the reverse side.

Interactive Science is an elementary science program that makes learning personal, engaging, and relevant for today's student. The program features an innovative Write-in Student Edition that enables students to become active participants in their learning and truly connect the Big Ideas of science to their world.

The 2016 editions of ***Interactive Science*** were developed to support the Next Generation Science Standards (NGSS) for Grades K-5 in several ways. In the Student Edition, lessons provide interactive opportunities for students to acquire the Disciplinary Core Ideas that are the building blocks of the NGSS Performance Expectations at each grade level. STEM Activities, Apply It! activities, Design It! Activities, and Performance-Based Assessments enable students to research, investigate, and apply Science and Engineering Practices to real-world problems in a meaningful way. In the Teacher's Edition, the NGSS Cross-Cutting Concepts that link across grade levels and across disciplines within grade levels are noted at the chapter level, and a detailed and focused Performance Expectation Activity is provided for each NGSS standard.

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Iowa Core Science Standards Foundation Boxes Evidence Statements	Interactive Science, ©2016 Grade 2

Grade 2

2-PS1-1 Matter and Its Interactions

Students who demonstrate understanding can:

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.]

Chapter 1 Performance Expectation Activity, 61a

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.(2-PS1-1) **SE/TE:** 6-15, STEM Activity; 48-49, Investigate It!; 58-59, Apply It! 148-149, Investigate It!; 196-197, Investigate It! **TE Only:** 3, SEP: Planning and Carrying Out Investigations; 49a-49c, Activity Card Support; 59, Possible Extensions; 61a, Performance Expectation Activity; 197a-197c, Activity Card Support	**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) **SE/TE:** 16-23, Lesson 1; 24-29, Lesson 2; 36, Explore It!; 38, Cooling Matter; 41, Properties of Materials; 56, Chapter Review – Lessons 1, 2; 58-59, Apply It!; 60, Group Objects; 181, Classify **TE Only:** 2C, Reading; 2D, Social Studies; 2D, Writing; 2G-2H, Leveled Content Reader Support; 23b, Chapter 1 Test – Questions 2, 5; 29a, My Planet Diary; 43, Differentiated Instruction; 49, Teach for Understanding; 52, Differentiated Instruction; 57a, Chapter 1 Test – Question 1; 61a, Performance Expectation Activity; 61a, ELA/Literacy; 61a, Mathematics	**Patterns** • Patterns in the natural and human designed world can be observed. (2-PS1-1) **SE/TE:** 16, Explore It!; 18, At-Home Lab; 27, At-Home Lab; 36, Explore It!; 194, Record Data; 196-197, Investigate It! **TE Only:** 39a, Explore It!; 118G-118H, Leveled Content Reader Support; 197a-197c, Activity Card Support

Observable features of the student performance by the end of the grade:		
1	Identifying the phenomenon under investigation	
	a	Students identify and describe* the phenomenon under investigation, which includes the following idea: different kinds of matter have different properties, and sometimes the same kind of matter has different properties depending on temperature.
	b	Students identify and describe* the purpose of the investigation, which includes answering a question about the phenomenon under investigation by describing* and classifying different kinds of materials by their observable properties.
2	Identifying the evidence to address the purpose of the investigation	
	a	Students collaboratively develop an investigation plan and describe* the evidence that will be collected, including the properties of matter (e.g., color, texture, hardness, flexibility, whether is it a solid or a liquid) of the materials that would allow for classification, and the temperature at which those properties are observed.
	b	Students individually describe* that:
		v. The observations of the materials provide evidence about the properties of different kinds of materials.
		vi. Observable patterns in the properties of materials provide evidence to classify the different kinds of materials.
3	Planning the investigation	
	a	In the collaboratively developed investigation plan, students include:
		vi. Which materials will be described* and classified (e.g., different kinds of metals, rocks, wood, soil, powders).
		vii. Which materials will be observed at different temperatures, and how those temperatures will be determined (e.g., using ice to cool and a lamp to warm) and measured (e.g., qualitatively or quantitatively).
		viii. How the properties of the materials will be determined.
		ix. How the materials will be classified (i.e., sorted) by the pattern of the properties.
	b	Students individually describe* how the properties of materials, and the method for classifying them, are relevant to answering the question.
4	Collecting the data	
	a	According to the developed investigation plan, students collaboratively collect and record data on the properties of the materials.

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2-PS1-2 Matter and Its Interactions

Students who demonstrate understanding can:

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.*]
Chapter 1 Performance Expectation Activity, 61b

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Analyze data from tests of an object or tool to determine if it works as intended. (2-PS1-2) **SE/TE:** 12-15, STEM Activity; 49, Investigate It! **TE Only:** 49b, Investigate It!; 61b, Performance Expectation Activity	**PS1.A: Structure and Properties of Matter** • Different properties are suited to different purposes. (2-PS1-2),(2-PS1-3) **SE/TE:** 6-15, STEM Activity; 40-47, Lesson 5; 57, Chapter 1 Review – Lesson 5; 225, Choose Materials **TE Only:** 20, Professional Development Note; 22, Evaluate; 33, Professional Development Note; 42, Professional Development Note; 43, Differentiated Instruction; 47, Common Misconception; 47a, Explore It!; 47b, Lesson 5 Check – Questions 3, 4; 57b, Chapter 1 Test – Question 8; 61b, Performance Expectation Activity; 61b, ELA/Literacy; 225, 21st Century Learning	**Cause and Effect** • Simple tests can be designed to gather evidence to support or refute student ideas about causes. (2-PS1-2) **SE/TE:** 4, Try It!; 38, Lightning Lab; 58-59, Apply It!; 148-149, Investigate It!; 222, Explore It! **TE Only:** 23, Common Misconceptions; 58, Science Misconception; 149a-149d, Activity Card Support --- ***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science, on Society and the Natural World** • Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (2-PS1-2) **SE/TE:** 6-15, STEM Activity; 45, Materials in Bridges **TE only:** 20, Professional Development Note

SE = Student Edition TE = Teacher's Edition

Observable features of the student performance by the end of the grade:		
1	Organizing data	
	a	Using graphical displays (e.g., pictures, charts, grade-appropriate graphs), students use the given data from tests of different materials to organize those materials by their properties (e.g., strength, flexibility, hardness, texture, ability to absorb).
2	Identifying relationships	
	a	Students describe* relationships between materials and their properties (e.g., metal is strong, paper is absorbent, rocks are hard, sandpaper is rough).
	b	Students identify and describe* relationships between properties of materials and some potential uses purpose (e.g., hardness is good for breaking objects or supporting objects; roughness is good for keeping objects in place; flexibility is good to keep a materials from breaking, but not good for keeping materials rigidly in place).
3	Interpreting data	
	a	Students describe* which properties allow a material to be well suited for a given intended use (e.g., ability to absorb for cleaning up spills, strength for building material, hardness for breaking a nut).
	b	Students use their organized data to support or refute their ideas about which properties of materials allow the object or tool to be best suited for the given intended purpose relative to the other given objects/tools (e.g., students could support the idea that hardness allows a wooden shelf to be better suited for supporting materials placed on it than a sponge would be, based on the patterns relating property to a purpose; students could refute an idea that a thin piece of glass is better suited to be a shelf than a wooden plank would be because it is harder than the wood by using data from tests of hardness and strength to give evidence that the glass is less strong than the wood) .
	c	Students describe* how the given data from the test provided evidence of the suitability of different materials for the intended purpose.

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2-PS1-3 Matter and Its Interactions

Students who demonstrate understanding can:

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.]
Chapter 1 Performance Expectation Activity, 61c

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. • Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (2-PS1-3) **SE/TE:** 4, Try It!; 18, At-Home Lab; 27, At-Home Lab; 48-49, Investigate It! **TE Only:** 49a-49c, Activity Card Support; 61c, Performance Expectation Activity	**PS1.A: Structure and Properties of Matter** • Different properties are suited to different purposes. (2-PS1-2),(2-PS1-3) **SE/TE:** 6-15, STEM Activity; 40-47, Lesson 5; 57, Chapter 1 Review – Lesson 5; 225, Choose Materials **TE Only:** 20, Professional Development Note; 22, Evaluate; 33, Professional Development Note; 42, Professional Development Note; 43, Differentiated Instruction; 47, Common Misconception; 47a, Explore It!; 47b, Lesson 5 Check – Questions 3, 4; 57b, Chapter 1 Test – Question 8; 61b, Performance Expectation Activity; 61b, ELA/Literacy; 225, 21st Century Learning	**Energy and Matter** • Objects may break into smaller pieces and be put together into larger pieces, or change shapes. (2-PS1-3) **SE/TE:** 30-35, Lesson 3; 40-47, Lesson 5; 57, Chapter 1 Review - Lesson 3; 61, Make a Presentation **TE Only:** 2, CCC: Energy and Matter; 35a, Explore It!: 35b, Lesson 3 Check – Questions 1-4; 61c, Performance Expectation Activity; 61c, ELA/Literacy

Iowa Science Standards, Foundation Boxes and Evidence Statements	Interactive Science, ©2016 Grade 2	
	• A great variety of objects can be built up from a small set of pieces. (2-PS1-3) **SE/TE:** 32, Mold It, Fold It, Tear It, Bend It; 34, Mix and Separate Matter; 40-47, Lesson 5; 57, Chapter Review – Lesson 5; 61, Make a Presentation **TE Only:** 35a, Explore It!; 47a, Explore It!; 47b, Lesson 5 Check – Questions 3, 4; 61c, Performance Expectation Activity; 61c, ELA/Literacy	

Observable features of the student performance by the end of the grade:		
1	Articulating the explanation of phenomena	
	a	Students articulate a statement that relates the given phenomenon to a scientific idea, including that an object made of a small set of pieces can be disassembled and made into a new object.
	b	Students use evidence and reasoning to construct an evidence-based account of the phenomenon.
2	Evidence	
	a	Students describe* evidence from observations (firsthand or from media), including:
		i. The characteristics (e.g., size, shape, arrangement of parts) of the original object.
		ii. That the original object was disassembled into pieces.
		iii. That the pieces were reassembled into a new object or objects.
		iv. The characteristics (e.g., size, shape, arrangement of parts) of the new object or objects.
3	Reasoning	
	a	Students use reasoning to connect the evidence to support an explanation. Students describe* a chain of reasoning that includes:
		i. The original object was disassembled into its pieces and is reassembled into a new object or objects.
		ii. Many different objects can be built from the same set of pieces.
		iii. Compared to the original object, the new object or objects can have different characteristics, even though they were made of the same set of pieces.

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2-PS1-4 Matter and Its Interactions

Students who demonstrate understanding can:

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.] Chapter 1 Performance Expectation Activity, 61d

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Engaging in Argument from Evidence Engaging in argument from evidence in K–2 builds on prior experiences and progresses to comparing ideas and representations about the natural and designed world(s). • Construct an argument with evidence to support a claim. (2-PS1-4) **SE/TE:** 30, Explore It!; 32, Draw; 33, Write; 188-191, Lesson 4 **TE Only:** 32-33 Explain; 35a, Explore It!; 61d, Performance Expectation Activity; 61d, ELA/Literacy; 191a, Explore It!; 191b, Lesson 4 Check – Questions 1-5 ---------- ***Connections to Nature of Science*** **Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena** • Scientists search for cause and effect relationships to explain natural events. (2-PS1-4) **SE/TE:** 4, Try It!; 27, At-Home Lab; 38, Lightning Lab **TE Only:** 61d, Performance Expectation Activity; 61d, ELA/Literacy	**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) **SE/TE:** 5, Let's Read Science; 24, My Planet Diary; 33, Other Ways Matter Can Change; 38, Cooling Matter; 38, Lightning Lab; 39, Heating Matter; 50, From Sand to Glass; 56, Chapter 1 Review – Lesson 3; 60, Cool a Balloon **TE Only:** 2G-2H, Leveled Content Reader Support; 20, Professional Development Note; 39b, Chapter 1 Lesson Check – Questions 2-4; 61d, Performance Expectation Activity; 61d, ELA/Literacy	**Cause and Effect** • Events have causes that generate observable patterns. (2-PS1-4) **SE/TE:** 4, Try It!; 24, My Planet Diary; 27, At-Home Lab; 38, Lightning Lab; 148-149, Investigate It!; 196-197, Investigate It!; 206, Try It!; 222, Explore It! **TE Only:** 29a, My Planet Diary; 197a-197c, Activity Card Support; 227a, Explore It!

Observable features of the student performance by the end of the grade:		
1	Supported claims	
	a	Students make a claim to be supported about a phenomenon. In their claim, students include the idea that some changes caused by heating or cooling can be reversed and some cannot.
2	Identifying scientific evidence	
	a	Students describe* the given evidence, including:
		i. The characteristics of the material before heating or cooling.
		ii. The characteristics of the material after heating or cooling.
		iii. The characteristics of the material when the heating or cooling is reversed.
3	Evaluating and critiquing the evidence	
	a	Students evaluate the evidence to determine:
		i. The change in the material after heating (e.g., ice becomes water, an egg becomes solid, solid chocolate becomes liquid).
		ii. Whether the change in the material after heating is reversible (e.g., water becomes ice again, a cooked egg remains a solid, liquid chocolate becomes solid but can be a different shape).
		iii. The change in the material after cooling (e.g., when frozen, water becomes ice, a plant leaf dies).
		iv. Whether the change in the material after cooling is reversible (e.g., ice becomes water again, a plant leaf does not return to normal).
	b	Students describe* whether the given evidence supports the claim and whether additional evidence is needed.
4	Reasoning and synthesis	
	a	Students use reasoning to connect the evidence to the claim. Students describe* the following chain of reasoning:
		i. Some changes caused by heating or cooling can be reversed by cooling or heating (e.g., ice that is heated can melt into water, but the water can be cooled and can freeze back into ice [and vice versa]).
		ii. Some changes caused by heating or cooling cannot be reversed by cooling or heating (e.g., a raw egg that is cooked by heating cannot be turned back into a raw egg by cooling the cooked egg, cookie dough that is baked does not return to its uncooked form when cooled, charcoal that is formed by heating wood does not return to its original form when cooled.

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2-LS2-1 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

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.*]

Chapter 2 Performance Expectation Activity, 117a

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (2-LS2-1) **SE/TE:** 64, Try It!; 79, Go Green; 94, Explore It!; 104-105, Investigate It!; 116, Light and Seeds **TE Only:** 105a-105c, Activity Card Support; 117a, Performance Expectation Activity	**LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on water and light to grow. (2-LS2-1) **SE/TE:** 64, Try It!; 77, Plant Needs; 94, Explore It!; 96, Forest; 99, Wetland/Rain Forest; 101, Energy from Food; 104-105, Investigate It!; 116, Light and Seeds **TE Only:** 62G-62H, Leveled Content Reader Support; 105a-105d, Activity Card Support; 117a, Performance Expectation Activity	**Cause and Effect** • Events have causes that generate observable patterns. (2-LS2-1) **SE/TE:** 64, Try It!; 77, Plant Needs; 79, Go Green; 104-105, Investigate It!; 116, Light and Seeds **TE Only:** 62, CCC: Cause and Effect; 105c, Guided Inquiry; 117a, Performance Expectation Activity

Observable features of the student performance by the end of the grade:		
1	Identifying the phenomenon under investigation	
	a	Students identify and describe* the phenomenon and purpose of the investigation, which include answering a question about whether plants need sunlight and water to grow.
2	Identifying the evidence to address the purpose of the investigation	
	a	Students describe* the evidence to be collected, including:
		i. Plant growth with both light and water.
		ii. Plant growth without light but with water.
		iii. Plant growth without water but with light.
		iv. Plant growth without water and without light.
	b	Students describe* how the evidence will allow them to determine whether plants need light and water to grow.
3	Planning the investigation	
	a	Students collaboratively develop an investigation plan. In the investigation plan, students describe* the features to be part of the investigation, including:
		i. The plants to be used.
		ii. The source of light.
		iii. How plants will be kept with/without light in both the light/dark test and the water/no water test.
		iv. The amount of water plants will be given in both the light/dark test and the water/no water test.
		v. How plant growth will be determined (e.g., observations of plant height, number and size of leaves, thickness of the stem, number of branches).
	b	Students individually describe* how this plan allows them to answer the question.
4	Collecting the data	
	a	According to the investigation plan developed, students collaboratively collect and record data on the effects on plant growth by:
		i. Providing both light and water,
		ii. Withholding light but providing water,
		iii. Withholding water but providing light, or
		iv. Withholding both water and light.

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2-LS2-2 Ecosystems: Interactions, Energy, and Dynamics

Students who demonstrate understanding can:

2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*

Chapter 2 Performance Expectation Activity, 117b

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. • Develop a simple model based on evidence to represent a proposed object or tool. (2-LS2-2) **SE/TE:** 88, Explore It!; 100, Explore It!; 114-115, Apply It!; 208-217, STEM Activity; 232, Lightning Lab **TE Only:** 63, SEP: Developing and Using Models; 93a, Explore It!; 103a, Explore It!; 117b, Performance Expectation Activity	**LS2.A: Interdependent Relationships in Ecosystems** • Plants depend on animals for pollination or to move their seeds around. (2-LS2-2) **SE/TE:** 79, Plant Parts; 81, Seed plants; 96, Forest **TE Only:** 117b, Performance Expectation Activity **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. *(secondary to 2-LS2-2)* **SE/TE:** 66-75, STEM Activity; 79, Draw; 87, Draw; 88, Explore It!; 90, Lightning Lab; 114-115, Apply It! **TE Only:** 62C, Social Studies; 93a, Explore It!; 117b, Performance Expectation Activity	**Structure and Function** • The shape and stability of structures of natural and designed objects are related to their function(s). (2-LS2-2) **SE/TE:** 78-79, Plant Parts; 84-85, Animals with Backbones; 86-87, Animals Without Backbones; 90-91, Animal Body Parts; 114-115, Apply It!; 232-233, Animal Body Parts as Tools **TE Only:** 63, SEP: Developing and Using Models; 117b, Performance Expectation Activity

Observable features of the student performance by the end of the grade:		
1	Components of the model	
	a	Students develop a simple model that mimics the function of an animal in seed dispersal or pollination of plants. Students identify the relevant components of their model, including those components that mimic the natural structure of an animal that helps it disperse seeds (e.g., hair that snares seeds, squirrel cheek pouches that transport seeds) or that mimic the natural structure of an animal that helps it pollinate plants (e.g., bees have fuzzy bodies to which pollen sticks, hummingbirds have bills that transport pollen). The relevant components of the model include:
		i. Relevant structures of the animal.
		ii. Relevant structures of the plant.
		iii. Pollen or seeds from plants.
2	Relationships	
	a	In the model, students describe* relationships between components, including evidence that the developed model mimics how plant and animal structures interact to move pollen or disperse seeds.
		i. Students describe* the relationships between components that allow for movement of pollen or seeds.
		ii. Students describe* the relationships between the parts of the model they are developing and the parts of the animal they are mimicking.
3	Connections	
	a	Students use the model to describe*:
		i. How the structure of the model gives rise to its function.
		ii. Structure-function relationships in the natural world that allow some animals to disperse seeds or pollinate plants.

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2-LS4-1 Biological Evolution: Unity and Diversity

Students who demonstrate understanding can:

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.*]

Chapter 2 Performance Expectation Activity, 117c

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. • Make observations (firsthand or from media) to collect data which can be used to make comparisons. (2-LS4-1) **SE/TE:** 65, Let's Read Science; 66-78, STEM Activity; 94, Explore It!; 104-105, Investigate It!; 117, Make Observations; 180, Science Skills **TE Only:** xliv-xlv, Quest; 97, Professional Development Note; 117c, Performance Expectation Activity; 117c, ELA/Literacy; 117c, Mathematics	**LS4.D: Biodiversity and Humans** • 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) **SE/TE:** 76, My Planet Diary; 82, My Planet Diary; 94-99, Lesson 4; 113, Chapter Review – Lesson 4; 116, Put on a Play; 117, Write a Song **TE Only:** xliv-xlv, Quest; 62G-62H, Leveled Content Reader Support; 99a, Explore It; 99b, Lesson 4, Check – Questions 1-5; 113b, Chapter 2 Test – Questions 5, 8; 117c, Performance Expectation Activity	

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Iowa Science Standards, Foundation Boxes and Evidence Statements	Interactive Science, ©2016 Grade 2	
---------- ***Connections to Nature of Science*** **Scientific Knowledge is Based on Empirical Evidence** • Scientists look for patterns and order when making observations about the world. (2-LS4-1) **SE/TE:** 100-103, Lesson 5 **TE Only:** 103a, Explore It; 103b, Lesson 5 Check – Questions 1, 6; 117c, Performance Expectation Activity		

Observable features of the student performance by the end of the grade:		
1	Identifying the phenomenon under investigation	
	a	Students identify and describe* the phenomenon and purpose of the investigation, which includes comparisons of plant and animal diversity of life in different habitats.
2	Identifying the evidence to address the purpose of the investigation	
	a	Based on the given plan for the investigation, students describe* the following evidence to be collected:
		i. Descriptions* based on observations (firsthand or from media) of habitats, including land habitats (e.g., playground, garden, forest, parking lot) and water habitats (e.g., pond, stream, lake).
		ii. Descriptions* based on observations (firsthand or from media) of different types of living things in each habitat (e.g., trees, grasses, bushes, flowering plants, lizards, squirrels, ants, fish, clams).
		iii. Comparisons of the different types of living things that can be found in different habitats.
	b	Students describe* how these observations provide evidence for patterns of plant and animal diversity across habitats.
3	Planning the investigation	
	a	Based on the given investigation plan, students describe* how the different plants and animals in the habitats will be observed, recorded, and organized.
4	Collecting the data	
	a	Students collect, record, and organize data on different types of plants and animals in the habitats.

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2-ESS1-1 Earth's Place in the Universe

Students who demonstrate understanding can:

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.*]

Chapter 3 Performance Expectation Activity, 159a

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. • Make observations from several sources to construct an evidence-based account for natural phenomena. (2-ESS1-1) **SE/TE:** 138, Explore It!; 141, Lightning Lab; 144, Explore It!; 148-149, Investigate It!; 158, Erosion **TE Only:** 119, SEP: Constructing Explanations and Designing Solutions; 159a, Performance Expectation Activity; 159a, ELA/Literacy	**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) **SE/TE:** 138-143, Lesson 2; 146, How Fossils Form; 147, What Fossils Show; 148-149, Investigate It!; 158, Erosion **TE Only:** 118, Professional Development Note; 141, Science Notebook; 143a, Explore It!; 143b, Lesson 2 Check; 155b, Chapter 3 Test – Questions 7, 8; 159a, Performance Expectation Activity	**Stability and Change** • Things may change slowly or rapidly. (2-ESS2-1) **SE/TE:** 138-143, Lesson 2; 146, How Fossils Form; 147, What Fossils Show; 148-149, Investigate It!; 158, Erosion **TE Only:** 118, CCC: Stability and Change; 141, Science Notebook; 143a, Explore It!; 143b, Lesson 2 Check; 155b, Chapter 3 Test – Questions 7, 8; 159a, Performance Expectation Activity

Observable features of the student performance by the end of the grade:		
1	Articulating the explanation of phenomena	
	a	Students articulate a statement that relates the given phenomenon to a scientific idea, including that Earth events can occur very quickly or very slowly.
	b	Students use evidence and reasoning to construct an evidence-based account of the phenomenon.
2	Evidence	
	a	Students describe* the evidence from observations (firsthand or from media; e.g., books, videos, pictures, historical photos), including:
		i. That some Earth events occur quickly (e.g., the occurrence of flood, severe storm, volcanic eruption, earthquake, landslides, erosion of soil).
		ii. That some Earth events occur slowly.
		iii. Some results of Earth events that occur quickly.
		iv. Some results of Earth events that occur very slowly (e.g., erosion of rocks, weathering of rocks).
		v. The relative amount of time it takes for the given Earth events to occur (e.g., slowly, quickly, hours, days, years).
	b	Students make observations using at least three sources
3	Reasoning	
	a	Students use reasoning to logically connect the evidence to construct an evidence-based account. Students describe* their reasoning, including:
		i. In some cases, Earth events and the resulting changes can be directly observed; therefore those events must occur rapidly.
		ii. In other cases, the resulting changes of Earth events can be observed only after long periods of time; therefore these Earth events occur slowly, and change happens over a time period that is much longer than one can observe.

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2-ESS2-1 Earth's Systems

Students who demonstrate understanding can:

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.]

Chapter 3 Performance Expectation Activity, 159b

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. • Compare multiple solutions to a problem. (2-ESS2-1) **SE/TE:** 122-131, STEM Activity; 159, Model Earthquake Damage **TE Only:** 159b, Performance Expectation Activity; 159b, ELA/Literacy •	**ESS2.A: Earth Materials and Systems** • Wind and water can change the shape of the land. (2-ESS2-1) **SE/TE:** 133, Land and Water; 139, Changes on Earth; 140, Earthquakes and Volcanoes; 141, Weathering and Erosion; 142, Water Changes the Land; 143; Other Causes of Erosion; 148-149, Investigate It!; 154-155, Chapter Review, Lesson 2; 158, Erosion **TE Only:** 118D, Teacher Background; 118G, Leveled Content Reader Support; 118, Talk About the Picture; 140, Differentiated Instruction; 143b, Lesson 2 Check, Questions 1, 2, 4; 149a-149d, Investigate It!; 155a, Chapter 3 Test – Questions 3, 4; 155b, Chapter 3 Test – Question 8; 159a, Performance Expectation Activity	**Stability and Change** • Things may change slowly or rapidly. (2-ESS2-1) **SE/TE:** 138-143, Lesson 2; 146, How Fossils Form; 147, What Fossils Show; 148-149, Investigate It!; 158, Erosion **TE Only:** 118, CCC: Stability and Change; 141, Science Notebook; 143a, Explore It!; 143b, Lesson 2 Check; 155b, Chapter 3 Test – Questions 7, 8; 159a, Performance Expectation Activity

Iowa Science Standards, Foundation Boxes and Evidence Statements	Interactive Science, ©2016 Grade 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. *(secondary to 2-ESS2-1)* **SE/TE:** 122-131, STEM Activity **TE Only:** 159b, Performance Expectation Activity	--- ***Connections to Engineering, Technology, and Applications of Science*** **Influence of Engineering, Technology, and Science on Society and the Natural World** • Developing and using technology has impacts on the natural world. (2-ESS2-1) **SE/TE:** 122-131, STEM Activity; 139, Changes on Earth **TE Only:** 122, Background; 140 Differentiated Instruction; 141, Professional Development Note; 159b, Performance Expectation Activity; 159b, ELA/Literacy --- ***Connections to Nature of Science*** **Science Addresses Questions About the Natural and Material World** • Scientists study the natural and material world. (2-ESS2-1) **SE/TE:** 174-177, Lesson 1; 198, Shonte Wright; 202, Part 1 Review – Lessons 1, 2 **TE Only:** 160G, Leveled Content Reader Support; 160, Talk About the Picture; 177a, My Planet Diary; 177b, Lesson 1 Check – Questions 1-5

Observable features of the student performance by the end of the grade:		
1	Using scientific knowledge to generate design solutions	
	a	Students describe* the given problem, which includes the idea that wind or water can change the shape of the land by washing away soil or sand.
	b	Students describe* at least two given solutions in terms of how they slow or prevent wind or water from changing the shape of the land.
2	Describing* specific features of the design solution, including quantification where appropriate	
	a	Students describe* the specific expected or required features for the solutions that would solve the given problem, including:
		i. Slowing or preventing wind or water from washing away soil or sand.
		ii. Addressing problems created by both slow and rapid changes in the environment (such as many mild rainstorms or a severe storm and flood).
3	Evaluating potential solutions	
	a	Students evaluate each given solution against the desired features to determine and describe* whether and how well the features are met by each solution.
	b	Using their evaluation, students compare the given solutions to each other.

Iowa Science Standards, Foundation Boxes and Evidence Statements	Interactive Science, ©2016 Grade 2

2-ESS2-2 Earth's Systems

Students who demonstrate understanding can:

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.*]

Chapter 3 Performance Expectation Activity, 159c

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. • Develop a model to represent patterns in the natural world. (2-ESS2-2) **SE/TE:** 138, Explore It!; 141, Lightning Lab; 144, Explore It!; 146, At-Home Lab; 159, Model Earthquake Damage **TE Only:** 135, 21st Century Learning; 159c, Performance Expectation Activity	**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) **SE/TE:** 120, Try It!; 133, Land and Water; 159, Make a Puzzle **TE Only:** 134, At-Home Lab; 135, Elaborate; 155a, Chapter 3 Test – Questions 1, 6; 159a, ELA/Literacy; 159c, Mathematics; 176, Science, Social Studies	**Patterns** • Patterns in the natural world can be observed. (2-ESS2-2),(2-ESS2-3) **SE/TE:** 120, Try It!; 134-137; 148-149, Investigate It!; 156-157, Apply It!; 158, Erosion; 196-197, Investigate It! **TE Only:** 118D, Teacher Background; 118G-118H, Leveled Content Reader Support; 136, Explain; 149c, Guided Inquiry; 159c, Mathematics; 159d, Performance Expectation Activity; 197c, Guided Inquiry

Observable features of the student performance by the end of the grade:		
1	Components of the model	
	a	Students develop a model (i.e., a map) that identifies the relevant components, including components that represent both land and bodies of water in an area.
2	Relationships	
	a	In the model, students identify and describe* relationships between components using a representation of the specific shapes and kinds of land (e.g., playground, park, hill) and specific bodies of water (e.g., creek, ocean, lake, river) within a given area.
	b	Students use the model to describe* the patterns of water and land in a given area (e.g., an area may have many small bodies of water; an area may have many different kinds of land that come in different shapes).
3	Connections	
	a	Students describe* that because they can map the shapes and kinds of land and water in any area, maps can be used to represent many different types of areas.

Iowa Science Standards, Foundation Boxes and Evidence Statements	Interactive Science, ©2016 Grade 2

2-ESS2-3 Earth's Systems

Students who demonstrate understanding can:

2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.

Chapter 3 Performance Expectation Activity, 159d

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Obtaining, Evaluating, and Communicating Information Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information. • Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question. (2-ESS2-3) **SE/TE:** 158, Make a Poster **TE Only:** 140, Differentiated Instruction; 143, Differentiated Instruction; 159a, Performance Expectation Activity; 159a, ELA/Literacy; 159c, Performance Expectation Activity; 159c, ELA/Literacy; 159d, Performance Expectation Activity	**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) **SE/TE:** 120, Try It!; 133, Land and Water; 135, Water surrounds an island; 136, The Ocean/Lakes and Ponds; 137, Rivers and Streams/Glaciers; 154, Chapter Review – Lesson 1; 159, Make a Puzzle **TE Only:** 137b, Lesson 1 Check – Question 4; 159c, Performance Expectation Activity; 159d, Performance Expectation Activity; 159d, ELA/ Literacy	**Patterns** • Patterns in the natural world can be observed. (2-ESS2-2),(2-ESS2-3) **SE/TE:** 120, Try It!; 134-137; 148-149, Investigate It!; 156-157, Apply It!; 158, Erosion; 196-197, Investigate It! **TE Only:** 118D, Teacher Background; 118G-118H, Leveled Content Reader Support; 136, Explain; 149c, Guided Inquiry; 159c, Mathematics; 159d, Performance Expectation Activity; 197c, Guided Inquiry

Observable features of the student performance by the end of the grade:		
1	Obtaining information	
	a	Students use books and other reliable media as sources for scientific information to answer scientific questions about:
		i. Where water is found on Earth, including in oceans, rivers, lakes, and ponds.
		ii. The idea that water can be found on Earth as liquid water or solid ice (e.g., a frozen pond, liquid pond, frozen lake).
		iii. Patterns of where water is found, and what form it is in.
2	Evaluating Information	
	a	Students identify which sources of information are likely to provide scientific information (e.g., versus opinion).

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K-2-ETS1-1 Engineering Design

Students who demonstrate understanding can:

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 tool.

Grade 2: Chapter 1 Performance Expectation Activity, 61c

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Asking Questions and Defining Problems Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. • Ask questions based on observations to find more information about the natural and/or designed world(s). (K-2-ETS1-1) **Grade 2 SE/TE:** 58, Apply It!; 156, Apply It!; 174-177, Lesson 1; 190, Ask a Question **Grade 2 TE Only:** 117a, Performance Expectation Activity; 143, Differentiated Instruction; 197a, Activity Card Support	**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) **Grade 2 SE/TE:** 6-15, STEM Activity; 66-75, STEM Activity; 122-131, STEM Activity; 164-173, STEM Activity; 208-217, STEM Activity; 222-227, Lesson 2; 242-247, Design It!; 248, Design a Solution **Grade 2 TE Only:** 160G-160H, Leveled Content Reader Support; 227a, Explore It!; Lesson 2 Check-Questions 1-5	

Iowa Science Standards, Foundation Boxes and Evidence Statements		Interactive Science, ©2016 Grade 2
• Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2-ETS1-1) • **Grade 2 SE/TE:** 6-7, Find a Problem; 67, Find a Problem; 122-123, Find a Problem; 164-165, Find a Problem; 208-209, Find a Problem; 242, Find a Problem **Grade 2 TE Only:** 160G-160H, Leveled Content Reader Support	• Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) **Grade 2 SE/TE:** 6-7, Find a Problem; 66-67, Find a Problem; 122-123, Find a Problem; 164-165, Find a Problem; 208-209, Find a Problem; 242-243, Find a Problem; 248, Find a Problem **Grade 2 TE Only:** 160G-160H, Leveled Content Reader Support • Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) **Grade 2 SE/TE:** 6-7, Find a Problem; 8-9, Plan and Draw; 10-11, Choose Materials; 66-67, Find a Problem; 68-69, Plan and Draw; 70-71, Choose Materials; 122-123, Find a Problem; 124-125, Plan and Draw; 126-127, Choose Materials; 164-165, Find a Problem; 166-167, Plan and Draw; 168-169, Choose Materials; 208-209, Find a Problem; 210-211, Plan and Draw; 212-213, Choose Materials; 242, Find a Problem; 243, Plan and Draw; 244, Choose Materials; 248, Find a Problem **Grade 2 TE Only:** 160G-160H, Leveled Content Reader Support	

Observable features of the student performance by the end of the grade:		
1	Addressing phenomena of the natural or designed world	
	a	Students ask questions and make observations to gather information about a situation that people want to change. Students' questions, observations, and information gathering are focused on:
		vii. A given situation that people wish to change.
		viii. Why people want the situation to change.
		ix. The desired outcome of changing the situation.
2	Identifying the scientific nature of the question	
	a	Students' questions are based on observations and information gathered about scientific phenomena that are important to the situation.
3	Identifying the problem to be solved	
	a	Students use the information they have gathered, including the answers to their questions, observations they have made, and scientific information, to describe* the situation people want to change in terms of a simple problem that can be solved with the development of a new or improved object or tool.
4	Defining the features of the solution	
	a	With guidance, students describe* the desired features of the tool or object that would solve the problem, based on scientific information, materials available, and potential related benefits to people and other living things.

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K-2-ETS1-2 Engineering Design

Students who demonstrate understanding can:
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.
Grade 2: Chapter 2 Performance Expectation Activity, 117b

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Developing and Using Models Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. • Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2) **Grade 2 SE/TE:** 6-15, STEM Activity; 40, Explore It!; 47, Explore It!; 88, Explore It!; 144, Explore It!; 159, Model Earthquake Damage; 232, Lightning Lab **Grade 2 TE Only:** 63, SEP: Developing and Using Models; 93a, Explore It!; 135, 21st Century Learning; 147a, Explore It!	**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) **Grade 2 SE/TE:** 7, Question 3; 11, Question 9; 67, Question 2; 69, Question 6; 71, Question 9; 72, Question 10; 73, Question 12; 75, Question 15; 128, Question 12; 130, Question 15; 165, Question 2; 166, Question 3; 169, Question 9; 170, Question 10; 173, Question 17; 210, Question 3; 211, Question 6; 213, Question 9; 214, Question 10; 217, Question 15; 243, Question 3 **Grade 2 TE Only:** 160G-160H, Leveled Content Reader Support	**Structure and Function** • The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2) **Grade 2 SE/TE:** 45, Materials in Bridges; 47, Materials in Towers; 182, Explore It!; 183, Tools; 184-185, More Tools **Grade 2 TE Only:** 47a, Explore It!; 117b, Performance Expectation Activity; 187, 21st Century Learning; 187a, Explore It!; 204, CCC: Structure and Function

Observable features of the student performance by the end of the grade:		
1	Components of the model	
	a	Students develop a representation of an object and the problem it is intended to solve. In their representation, students include the following components:
		vii. The object.
		viii. The relevant shape(s) of the object.
		ix. The function of the object.
	b	Students use sketches, drawings, or physical models to convey their representations.
2	Relationships	
	a	Students identify relationships between the components in their representation, including:
		v. The shape(s) of the object and the object's function.
		vi. The object and the problem is it designed to solve.
3	Connections	
	a	Students use their representation (simple sketch, drawing, or physical model) to communicate the connections between the shape(s) of an object, and how the object could solve the problem.

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K-2-ETS1-3 Engineering Design

Students who demonstrate understanding can:

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.

Grade 2: Chapter 3 Performance Expectation Activity, 159b

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Analyzing and Interpreting Data Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. • Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3) **Grade 2 SE/TE:** 12-13, Make and Test; 72-73, Make and Test; 74, Question 13; 114-115, Apply It!; 128-129, Make and Test; 130, Record and Share; 170-171, Make and Test; 214-215, Make and Test; 235, Analyze and Conclude; 245, Make and Test **Grade 2 TE Only:** 61b, Performance Expectation Activity; 205, SEP: Analyzing and Interpreting Data	**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) **Grade 2 SE/TE:** 9, Question 6; 12-13, Make and Test; 14-15, Record and Share; 74-75, Record and Share; 131, Record and Share; 172-173, Record and Share; 216-217, Record and Share; 246-247, Record and Share **Grade 2 TE Only:** 160G-160H, Leveled Content Reader Support	

Observable features of the student performance by the end of the grade:		
1	Organizing data	
	a	With guidance, students use graphical displays (e.g., tables, pictographs, line plots) to organize given data from tests of two objects, including data about the features and relative performance of each solution.
2	Identifying relationships	
	a	Students use their organization of the data to find patterns in the data, including:
		v. How each of the objects performed, relative to:
		5. The other object.
		6. The intended performance.
		vi. How various features (e.g., shape, thickness) of the objects relate to their performance (e.g., speed, strength).
3	Interpreting data	
	a	Students use the patterns they found in object performance to describe*:
		vii. The way (e.g., physical process, qualities of the solution) each object will solve the problem.
		viii. The strengths and weaknesses of each design.
		ix. Which object is better suited to the desired function, if both solve the problem.