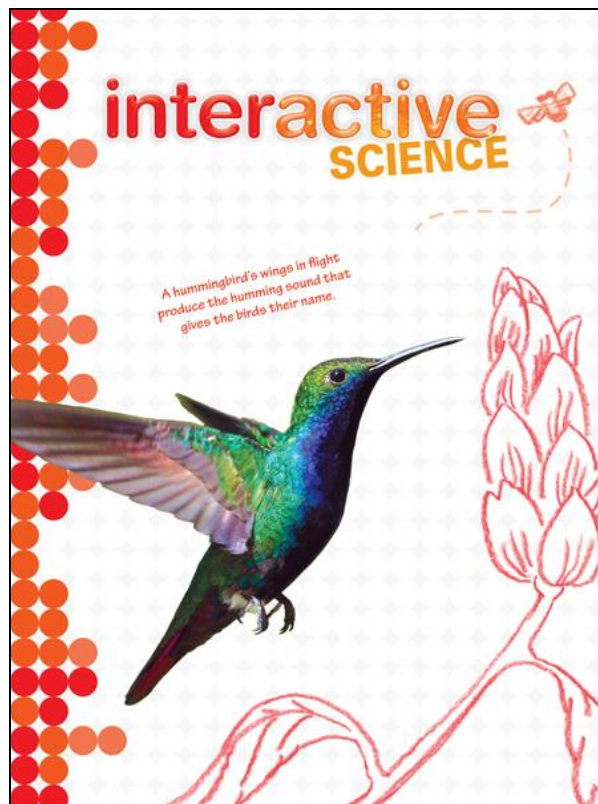


A Correlation of
Interactive Science
Grade 4, ©2016



To the
**Louisiana Student Standards for
Science**

A Correlation of *Interactive Science, Grade 4, ©2016*, to the Louisiana Student Standards for Science

Introduction

The following document indicates how closely *Interactive Science, ©2016, Grades K-5*, supports Louisiana Student Standards for Science, 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* support the Next Generation Science Standards (NGSS) 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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Louisiana Student Standards for Science	Interactive Science, Grade 4 ©2016
4-PS3-1 ENERGY	
Performance Expectation	
Use evidence to construct an explanation relating the speed of an object to the energy of that object.	TE Only: 111a, Performance Expectation Activity
Clarification Statement	
Relating the speed of an object to the energy of the object does not require calculation of the object's speed.	
Science & Engineering Practices	
6. Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems	
<ul style="list-style-type: none"> Use evidence (e.g., measurements, observations, patterns) to construct or support an explanation or design a solution to a problem. 	SE/TE: 36, Science in Your Backyard; 48, Try It!; 62, Explore It!; 64, At-Home Lab; 68-69, Investigate It TE Only: 46D, The Force of Seatbelts and Airbags; 67a, Explore It!; 79, SEP: Construction Explanations and Designing Solutions; 111a, Performance Expectation Activity
Disciplinary Core Ideas	
DEFINITIONS OF ENERGY	
The faster a given object is moving, the more energy it possesses. (UE.PS3A.a)	SE/TE: 10-11, Forms of Energy; 30, A Conduction Example; 31, Convection/Radiation; 62, Explore It! 63, Speed; 64, At-Home Lab; 75, Chapter Review, Lesson 2; Benchmark Practice-Question 3; 77, Go Green! TE Only: 1G-1H, Leveled Content Reader Support; 8, Professional Development Note; 30, Professional Development Note; 67a, Explore It! 111a, Performance Expectation Activity; 111a, ELA/Literacy

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Crosscutting Concepts	
ENERGY AND MATTER	
<p>Energy can be transferred in various ways and between objects.</p>	<p>SE/TE: 16, My Planet Diary; 17, Sound Energy; 18, How Sounds Travels; 24, Light Waves We See; 27, Absorption; 28-34, Lesson 4; 34-35, Investigate It!; 36, Science in Your Backyard; 42-43, Chapter Review – Lessons 2 and 4; 44, Benchmark Practice – Question 5; 59, Lightning Lab; 80, Try It!; 81, Let’s Read Science; 82-85, STEM Activity; 86-91, Lesson 1; 92-95, Lesson 2; 103, Chapter Review, Lesson 2; 104, Benchmark Practice – Question 5; 111, Design a Device</p> <p>TE Only: 11, CCC: Energy and Matter; 33a, Explore It!; 33b, Lesson 1 Check – Questions 1-6; 35a-35d, Activity Card Support; 43a-43b, Chapter 1 Test – Questions 7-10; 46, CCC: Energy and Matter; 78, CCC: Energy and Matter; 95a, Explore It!; 95b, Lesson 2 Check – Questions 1-6; 97b, Investigate It!; 103a, Chapter 3 Test – Questions 1, 3, 5; 103b, Chapter 3 Test – Questions 9, 10; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111d, Performance Expectation Activity</p>

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Louisiana Student Standards for Science	Interactive Science, Grade 4 ©2016
4-PS3-2 ENERGY	
Performance Expectation	
Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	TE Only: Chapters 1 and 3 Performance Expectation Activity, 111b
Clarification Statement	
When energy is transferred it may change forms such as when light from the sun warms a window pane.	
Science & Engineering Practices	
3. Planning and carrying out Investigations: Planning and carrying out investigations to answer questions (science) or test solutions (engineering) to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.	
<ul style="list-style-type: none"> Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. 	SE/TE: 2, Try It!; 28, Explore It!; 34-35, Investigate It!; 68-69, Investigate It!; 80, Try It!; 106-109, Apply It!; 110, Height and Potential Energy; 194, Explore It! TE Only: 1, SEP: Planning and Carrying Out Investigations; 33a, Explore It!; 67a, Explore It!; 78C, Electrical Charges and Interactions; 111a, Performance Expectation Activity; 111c, Performance Expectation Activity; 199a, Explore It!
Disciplinary Core Ideas	
DEFINITIONS OF ENERGY	
Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (UE.PS3A.b)	SE/TE: 14-15, Energy and Motion/Forms of Potential Energy; 16, My Planet Diary; 17, Sound Energy; 18, How Sounds Travels; 24, Light Waves We See; 26-27, Light and Matter; 36, Science in Your Backyard; 80, Try It!; 88, How Electric Charges Flow; 90-91, Circuits; 92-95, Lesson 2; 102, Chapter Review – Lesson 1; 103, Chapter Review – Lesson 2; 104, Benchmark Practice – Question 3 TE Only: 1G-1H, Leveled Content Reader Support; 91b, Lesson 1 Check – Questions 1, 6; 95a, Explore It!; 95b, Lesson 2 Check – Questions 1-6; 103a, Chapter 3 Test – Questions 3, 4; 103b, Chapter 3 Test – Questions 9, 10; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111e, Performance Expectation Activity

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CONSERVATION OF ENERGY AND ENERGY TRANSFER	
Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. (UE.PS3B.a)	SE/TE: 2, Try It!; 9, Energy; 10-11, Forms of Energy; 12-13, Where is the Energy?; 14, Energy and Motion; 17, Sound Energy, 24, Light Waves We See; 29, Conduction; 30, At-Home Lab; 31, Convection/Radiation; 44, Benchmark Practice – Question 1; 58, Forces Affect Objects; 59, Force and Motion; 59, Lightning Lab; 82-85, STEM Activity; 110, Height and Potential Energy TE Only: 1C-1D, Teacher Background; 1G-1H, Leveled Content Reader Support; 15b, Lesson 1 Check – Question 5; 43a, Chapter 1 Test – Question 1; 43b, Chapter 1 Test – Question 7; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111c, Performance Expectation Activity; 111c, ELA/Literacy
Light also transfers energy from place to place. (UE.PS3B.b)	SE/TE: 11, Light Energy; 22-27, Lesson 3; 93, Energy Changing Form; 94, Light from Electricity; 103, Chapter Review – Do the Math TE Only: 1C, Teacher Background; 1G-1H, Leveled Content Reader Support; 27b, Lesson 3 Check – Question 5; 95b, Lesson 2 Check – Question 1; 111b, Performance Expectation Activity; 111b, Mathematics
Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. (UE.PS3B.c)	SE/TE: 10, Electrical Energy; 88-89, How Electric Charges Flow; 90-91, Circuits; 92-95, Lesson 2; 98, Science Careers; 102, Chapter Review – Lesson 1; 103, Chapter Review – Lesson 2; 104, Benchmark Practice – Question 5 TE Only: 1G-1H, Leveled Content Reader Support; 78D, Transformer Basics; 91b, Lesson 1 Check – Questions 2, 4, 6; 95a, Explore It!; 95b, Lesson 2 Check – Questions 1-6; 103b, Chapter 3 Test – Question 10; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111e, Performance Expectation Activity

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Crosscutting Concepts	
ENERGY AND MATTER	
<p>Energy can be transferred in various ways and between objects.</p>	<p>SE/TE: 16, My Planet Diary; 17, Sound Energy; 18, How Sounds Travels; 24, Light Waves We See; 27, Absorption; 28-34, Lesson 4; 34-35, Investigate It!; 36, Science in Your Backyard; 42-43, Chapter Review – Lessons 2 and 4; 44, Benchmark Practice – Question 5; 59, Lightning Lab; 80, Try It!; 81, Let’s Read Science; 82-85, STEM Activity; 86-91, Lesson 1; 92-95, Lesson 2; 103, Chapter Review, Lesson 2; 104, Benchmark Practice – Question 5; 111, Design a Device</p> <p>TE Only: 11, CCC: Energy and Matter; 33a, Explore It!; 33b, Lesson 1 Check – Questions 1-6; 35a-35d, Activity Card Support; 43a-43b, Chapter 1 Test – Questions 7-10; 46, CCC: Energy and Matter; 78, CCC: Energy and Matter; 95a, Explore It!; 95b, Lesson 2 Check – Questions 1-6; 97b, Investigate It!; 103a, Chapter 3 Test – Questions 1, 3, 5; 103b, Chapter 3 Test – Questions 9, 10; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111d, Performance Expectation Activity</p>

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Louisiana Student Standards for Science	Interactive Science, Grade 4 ©2016
4-PS3-3 ENERGY	
Performance Expectation	
Ask questions and predict outcomes about the changes in energy that occur when objects collide.	TE Only: Chapters 1 and 2 Performance Expectation Activity, 111c
Clarification Statement	
Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact. Quantitative measurements of energy are not included.	
Science & Engineering Practices	
1. Asking questions and defining problems: Asking questions (science) and defining problems (engineering) in 3-5 builds on K-2 experiences and progresses to specifying qualitative relationships.	
<ul style="list-style-type: none"> Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. 	SE/TE: 59, Lightning Lab; 110, Height and Potential Energy; 305, Questions; 307, Got It?; 314, Explore it!; 316-317, A Bouncing-Ball Experiment; 328, Go Further TE Only: 47, SEP: Asking Questions and Defining Problems; 111c, Performance Expectation Activity; 328, 21 st Century Learning
Disciplinary Core Ideas	
DEFINITIONS OF ENERGY	
Energy can be moved from place to place by moving objects or through sound, light, or electric currents. (UE.PS3A.b)	SE/TE: 14-15, Energy and Motion/Forms of Potential Energy; 16, My Planet Diary; 17, Sound Energy; 18, How Sound Travels; 26-27, Light and Matter; 36, Science in Your Backyard; 80, Try It!; 88, How Electric Charges Flow; 90-91, Circuits; 92-95, Lesson 2; 102, Chapter Review – Lesson 1; 103, Chapter Review – Lesson 2; 104, Benchmark Practice – Question 3 TE Only: 1G-1H, Leveled Content Reader Support; 91b, Lesson 1 Check – Questions 1, 6; 95a, Explore It!; 95b, Lesson 2 Check – Questions 1-6; 103a, Chapter 3 Test – Questions 3, 4; 103b, Chapter 3 Test – Questions 9, 10; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111e, Performance Expectation Activity

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CONSERVATION OF ENERGY AND ENERGY TRANSFER	
<p>Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced. (UE.PS3B.a)</p>	<p>SE/TE: 2, Try It!; 9, Energy; 10-11, Forms of Energy; 12-13, Where is the Energy?; 14, Energy and Motion; 17, Sound Energy, 24, Light Waves We See; 29, Conduction; 30, At-Home Lab; 31, Convection/Radiation; 44, Benchmark Practice – Question 1; 58, Forces Affect Objects; 59, Force and Motion; 59, Lightning Lab; 82-85, STEM Activity; 110, Height and Potential Energy TE Only: 1C-1D, Teacher Background; 1G-1H, Leveled Content Reader Support; 15b, Lesson 1 Check – Question 5; 43a, Chapter 1 Test – Question 1; 43b, Chapter 1 Test – Question 7; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111c, Performance Expectation Activity; 111c, ELA/Literacy</p>
RELATIONSHIP BETWEEN ENERGY AND FORCES	
<p>When objects collide, the contact forces transfer energy so as to change the objects' motions. (UE.PS3C.a)</p>	<p>SE/TE: 17, Sound Energy; 58, Forces Affect Objects; 59, Force and Motion; 59, Lightning Lab; 110, Height and Potential Energy TE Only: 111c, Performance Expectation Activity; 111c, ELA/Literacy</p>

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Crosscutting Concepts	
ENERGY AND MATTER	
Energy can be transferred in various ways and between objects.	<p>SE/TE: 16, My Planet Diary; 17, Sound Energy; 18, How Sounds Travels; 24, Light Waves We See; 27, Absorption; 28-34, Lesson 4; 34-35, Investigate It!; 36, Science in Your Backyard; 42-43, Chapter Review – Lessons 2 and 4; 44, Benchmark Practice – Question 5; 59, Lightning Lab; 80, Try It!; 81, Let’s Read Science; 82-85, STEM Activity; 86-91, Lesson 1; 92-95, Lesson 2; 103, Chapter Review, Lesson 2; 104, Benchmark Practice – Question 5; 111, Design a Device</p> <p>TE Only: 11, CCC: Energy and Matter; 33a, Explore It!; 33b, Lesson 1 Check – Questions 1-6; 35a-35d, Activity Card Support; 43a-43b, Chapter 1 Test – Questions 7-10; 46, CCC: Energy and Matter; 78, CCC: Energy and Matter; 95a, Explore It!; 95b, Lesson 2 Check – Questions 1-6; 97b, Investigate It!; 103a, Chapter 3 Test – Questions 1, 3, 5; 103b, Chapter 3 Test – Questions 9, 10; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111d, Performance Expectation Activity</p>

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Louisiana Student Standards for Science	Interactive Science, Grade 4 ©2016
4-PS3-4 ENERGY	
Performance Expectation	
Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	TE Only: 111d , Performance Expectation Activity, 111d
Clarification Statement	
Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound and a passive solar heater that converts light into heat. Example of constraints could include the materials, cost, or time to design the device.	
Science & Engineering Practices	
6. Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.	
<ul style="list-style-type: none"> Apply scientific ideas to solve design problems. 	SE/TE: 4-7, STEM Activity; 50-53, STEM Activity; 96-97, Investigate It!; 344, Try It! TE Only: 35b, Investigate It!; 97a-97d, Activity Card Support; 79, SEP: Construction Explanations and Designing Solutions; 111d, Performance Expectation Activity
Disciplinary Core Ideas	
CONSERVATION OF ENERGY AND ENERGY TRANSFER	
Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. (UE.PS3B.c)	SE/TE: 10, Electrical Energy; 88-89, How Electric Charges Flow; 90-91, Circuits; 92-95, Lesson 2; 98, Science Careers; 102, Chapter Review – Lesson 1; 103, Chapter Review – Lesson 2; 104, Benchmark Practice – Question 5 TE Only: 1G-1H, Leveled Content Reader Support; 78D, Transformer Basics; 91b, Lesson 1 Check – Questions 2, 4, 6; 95a, Explore It!; 95b, Lesson 2 Check – Questions 1-6; 103b, Chapter 3 Test – Question 10; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111e, Performance Expectation Activity
ENERGY IN CHEMICAL PROCESSES AND EVERYDAY LIFE	
The expression “produce energy” typically refers to the conversion of stored energy into a desired form for practical use. (UE.PS3D.a)	SE/TE: 9, Energy; 10-11, Forms of Energy; 14-15, Forms of Potential Energy; 42, Chapter Review – Lesson 1 TE Only: 15b, Lesson 1 Check – Questions 1-4, 6

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OPTIMIZING THE DESIGN SOLUTION	
Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (UE.ETS1C.a)	SE/TE: 7, Evaluate and Redesign; 53, Evaluate and Redesign; 85, Evaluate and Redesign; 119, Evaluate and Redesign; 181, Evaluate and Redesign; 237, Evaluate and Redesign; 303, Evaluate and Redesign; 349, Evaluate and Redesign; 363, Step 8: Evaluate and Redesign; 379, Evaluate and Redesign
Crosscutting Concepts	
ENERGY AND MATTER	
Energy can be transferred in various ways and between objects.	SE/TE: 16, My Planet Diary; 17, Sound Energy; 18, How Sounds Travels; 24, Light Waves We See; 27, Absorption; 28-34, Lesson 4; 34-35, Investigate It!; 36, Science in Your Backyard; 42-43, Chapter Review – Lessons 2 and 4; 44, Benchmark Practice – Question 5; 59, Lightning Lab; 80, Try It!; 81, Let's Read Science; 82-85, STEM Activity; 86-91, Lesson 1; 92-95, Lesson 2; 103, Chapter Review, Lesson 2; 104, Benchmark Practice – Question 5; 111, Design a Device TE Only: 11, CCC: Energy and Matter; 33a, Explore It!; 33b, Lesson 1 Check – Questions 1-6; 35a-35d, Activity Card Support; 43a-43b, Chapter 1 Test – Questions 7-10; 46, CCC: Energy and Matter; 78, CCC: Energy and Matter; 95a, Explore It!; 95b, Lesson 2 Check – Questions 1-6; 97b, Investigate It!; 103a, Chapter 3 Test – Questions 1, 3, 5; 103b, Chapter 3 Test – Questions 9, 10; 111b, Performance Expectation Activity; 111b, ELA/Literacy; 111d, Performance Expectation Activity

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4-PS4-1 WAVES AND THEIR APPLICATIONS IN TECHNOLOGIES FOR INFORMATION TRANSFER	
Performance Expectation	
Develop a model of waves to describe patterns in terms of amplitude and wavelength and to show that waves can cause objects to move.	TE Only: Chapter 1 Performance Expectation Activity, 111e
Clarification Statement	
Examples of models could include diagrams, analogies, or physical models using wire to illustrate wavelength and amplitude of waves. Examples of wave patterns could include the vibrating patterns associated with sound or the vibrating patterns of seismic waves produced by earthquakes. Does not include interference effects, electromagnetic waves, non-periodic waves, or quantitative models of amplitude and wavelength.	
Science & Engineering Practices	
2. Developing and using models: Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.	
<ul style="list-style-type: none"> Develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution. 	SE/TE: 20, Lightning Lab; 320, Models TE Only: 111e, Performance Expectation Activity
Disciplinary Core Ideas	
WAVE PROPERTIES	
Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; it does not move in the direction of the wave except when the water meets the beach. (UE.PS4A.a)	SE/TE: 18, How Sound Travels; 19, Frequency and Wavelength; 269, Ocean and Seas TE Only: 1G-1H, Leveled Content Reader Support; 18, Professional Development Note
Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (UE.PS4A.b)	SE/TE: 18, How Sound Travels; 19, Frequency and Wavelength; 20-21, Frequency/Volume; 36, Science in Your Backyard TE Only: 19, Common Misconception; 19, Science Notebook; 21b, Lesson 2 Check – Questions 1, 4; 111e, Performance Expectation Activity

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Crosscutting Concepts	
PATTERNS	
<p>Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena and designed products.</p>	<p>SE/TE: 16-21. Lesson 1; 20, Lightning Lab 359, Step3: Develop Possible Solutions; 362, Step7: Communicate Results TE Only: 1C, The Speed of Sound; 1G, Leveled Content Reader Support; 111e, Performance Expectation Activity; 111f, Performance Expectation Activity</p>

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Louisiana Student Standards for Science	Interactive Science, Grade 4 ©2016
4-PS4-2 WAVES AND THEIR APPLICATIONS IN TECHNOLOGIES FOR INFORMATION TRANSFER	
Performance Expectation	
Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	TE Only: Chapter 1 Performance Expectation Activity, 111g
Clarification Statement	
Develop a model to make sense of a phenomenon involving the relationship between light reflection and visibility of objects. In the model, identify the relevant components including light and its source, objects, the path that light follows, and the eye.	
Science & Engineering Practices	
2. Developing and using models: Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.	
<ul style="list-style-type: none"> Develop and/or use models to describe and/or predict phenomena. 	SE/TE: 22, Explore It!; 22a111, Design a Device; TE Only: 111g, Performance Expectation Activity; 111g, ELA/Literacy;
Disciplinary Core Ideas	
ELECTROMAGNETIC RADIATION	
An object can be seen when light reflected from its surface enters the eyes. (UE.PS4B.a)	SE/TE: 22, Explore It!; 26-27, Light and Matter; 43, Chapter Review – Lesson 3; 308, Explore It! TE Only: 1G-1H, Leveled Content Reader Support; 23, Build Background; 26, Science – Writing; 26, Common Misconception; 27a, Explore It!; 27b, Lesson 3 Check – Question 4; 111b, Mathematics; 111g, Performance Expectation Activity; 111g, ELA/Literacy; 111g, Mathematics; 296D, Using a Microscope; 313a, Explore It!
Crosscutting Concepts	
CAUSE AND EFFECT	
Cause and effect relationships are routinely identified, tested, and used to explain change.	SE/TE: 2, Try It! TE Only: 27, Infer; 26, Determine; 78, CCC: Energy and Matter; 111g, Performance Expectation Activity

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4-LS1-1 FROM MOLECULES TO ORGANISMS: STRUCTURE AND PROCESSES	
Performance Expectation	
Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	TE Only: Chapter 4 Performance Expectation Activity, 229a
Clarification Statement	
Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, shells, fur or skin.	
Science & Engineering Practices	
7. Engaging in argument from evidence: Engaging in argument from evidence in 3–5 builds on K–2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).	
<ul style="list-style-type: none"> Construct and/or support an argument with evidence, data, and/or a model. 	SE/TE: 136, Explore It!; 142, Explore It!; 228, Write a Biography TE Only: xlvi–xlvii, Quest; 113, SEP: Engaging in Argument from Evidence; 125, Differentiated Instruction; 133, Differentiated Instruction; 141a, Explore It!; 144, Differentiated Instruction – Advanced; 146, Science Notebook; 147a, Explore It!; 151, Differentiated Instruction; 229a, Performance Expectation Activity; 229a, ELA/Literacy
Disciplinary Core Ideas	
STRUCTURE AND FUNCTION	
Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (UE.LS1A.a)	SE/TE: 114, Try It!; 122–123, Classifying Plants; 124–127, Classifying Animals; 128–135, Lesson 2; 136–141, Lesson 3; 142–147, Lesson 4; 170, Chapter Review – Lessons 1–4; 172, Benchmark Practice – Questions 4, 5, 6 TE Only: xlvi–xlvii, Quest; 112C, What Do Leaves and Stems Do?; 112G–112H, Leveled Content Reader Support; 126, Professional Development Note; 127b, Lesson 1 Check – Questions 1–5; 135a, My Planet Diary; 134, 21 st Century Learning; 135b, Lesson 2 Check – Questions 1–6; 141a, Explore It!; 141b, Lesson 3 Check – Questions 1–6; 147a, Explore It!; 147b, Lesson 4 Check – Questions 1–6; 171a, Chapter 4 Test – Questions 2, 3; 171b, Chapter 4 Test – Question 9; 229a, Performance Expectation Activity

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Crosscutting Concepts	
SYSTEMS AND SYSTEM MODELS	
A system can be described in terms of its components and their interactions.	SE/TE: 116-119, STEM Activity; 128-135, Lesson 2; 136-141, Lesson 3; 154, My Planet Diary; 178-181, STEM Activity; 228, Write a Biography TE Only: xlvi-xlvii, QUEST; 112, CCC: Systems and System Models; 154, Professional Development Note; 159a, My Planet Diary
4-LS1-2 FROM MOLECULES TO ORGANISMS: STRUCTURE AND PROCESSES	
Performance Expectation	
Construct an explanation to describe how animals receive different types of information through their senses, process the information in their brains, and respond to the information in different ways.	TE Only: Chapter 4 Performance Expectation Activity, 229b
Clarification Statement	
Emphasis is on systems of information transfer. Responses could include animals running from predators, animals returning to breeding grounds, animals scavenging for food, or humans responding to stimuli.	
Science & Engineering Practices	
6. Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.	
<ul style="list-style-type: none"> Construct an explanation of observed relationships (e.g., the distribution of plants in the back yard). 	TE Only: 174, Cause and Effect
Disciplinary Core Ideas	
STRUCTURE AND FUNCTION	
Different sense receptors are specialized for particular kinds of information, which then may be processed by the animal’s brain. Animals are able to use their perceptions and memories to guide their actions. (UE.LS1D.a)	SE/TE: 128, My Planet Diary; 132, Pollen on the Move; 154-159, Lesson 6; 171, Chapter Review – Lesson 6 TE Only: 135a, My Planet Diary; 159a, My Planet Diary; 159b, Lesson 6 Check – Questions 1-6; 171a, Chapter 4 Test – Questions 3, 6; 229b, Performance Expectation Activity

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Crosscutting Concepts	
CAUSE AND EFFECT	
Events that occur together with regularity might or might not be a cause and effect relationship.	TE Only: 174, Cause and Effect
4-ESS1-1 EARTH'S PLACE IN THE UNIVERSE	
Performance Expectation	
Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landforms over time.	TE Only: 295d, Chapter 6 Performance Expectation Activity
Clarification Statement	
Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time, and a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock. Does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formation and layers.	
Science & Engineering Practices	
6. Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems	
<ul style="list-style-type: none"> Identify the evidence that supports particular points in an explanation. 	SE/TE: 244, Explore It!; 247, Classify; 249, Identify; 293, Interpret Your Data; 321, Explanations; 326, Evidence and Inferences TE Only: 203, 21 st Century Learning; 204, Differentiated Instruction; 229c, Performance Expectation Activity; 229c, 248, Differentiated Instruction; 251, Differentiated Instruction – Advanced; 253a, Explore It!; ELA/Literacy; 295d, Performance Expectation Activity

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Disciplinary Core Ideas	
THE HISTORY OF PLANET EARTH	
Local, regional, and global patterns of rock formations reveal changes over time due to Earth's forces such as earthquakes and volcanoes. The presence and location of certain fossil types indicate the order in which rock layers were formed. (UE.ESS1C.a)	SE/TE: 210, Fossil Age; 244-251, Lesson 2; 260, My Planet Diary; 261, Earth's Moving Plates; 262, Volcanoes; 263, Earthquakes; 286, Lesson 2; 295, Create a Booklet TE Only: 211b, Lesson 5 Check – Question 4; 221b, Chapter 5 Test – Question 8; 229c, Performance Expectation Activity; 229c, ELA/Literacy; 230C, Uncovering Fossils; 230G-230H, Leveled Content Reader Support; 249, Professional Development Note; 253a, Explore It!; 253b, Lesson 2 Check – Questions 1-6; 287b, Chapter 6 Test – Questions 7, 8; 295d, Performance Expectation Activity; 295d, ELA/Literacy
Crosscutting Concepts	
PATTERNS	
Patterns can be used as evidence to support an explanation.	SE/TE: 244, Explore It!; 246-247, Igneous Rocks; 248-249, Sedimentary Rock; 252-253, The Rock Cycle; 254, Explore It!; 259, Deposition; 277, Water Cycle and Climate TE Only: 229c, Performance Expectation Activity; 295d, Performance Expectation Activity; 295d, ELA/Literacy

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4-ESS2-1 EARTH'S SYSTEM	
Performance Expectation	
Plan and conduct investigations on the effects of water, ice, wind, and vegetation on the relative rate of weathering and erosion.	TE Only: 295a, Chapter 6 Performance Expectation Activity
Clarification Statement	
Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.	
Science & Engineering Practices	
3. Planning and carrying out investigations: Planning and carrying out investigations to answer questions (science) or test solutions (engineering) to problems in 3-5 builds on K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions.	
<ul style="list-style-type: none"> Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. 	Grade 4 SE/TE: 4-7, 50-53, 82-85, 116-119, 178-181, 234-237, 300-303, 346-349, 357-363, Design Process; 374-379, Design It!
Disciplinary Core Ideas	
EARTH MATERIALS AND SYSTEMS	
Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. (UE.ESS2A.a)	SE/TE: 254-259, Lesson 3; 286, Chapter Review – Lesson 3; Benchmark Practice – Questions 7, 8; 290-293, Apply It! TE Only: 230D, Look Out Below!; 246, Common Misconception; 259a, Explore It!; 259b, Lesson 3 Check – Questions 1-6; 287b, Chapter 6 Test – Questions 9, 10); 295a, Performance Expectation Activity; 295a, ELA/Literacy
BIOGEOLOGY	
Living things affect the physical characteristics of their environment. (UE.ESS2E.a)	SE/TE: 188-193, Lesson 2; 214, Rachel Carson; 220, Chapter Review – Lesson 2; 229, Make a Presentation; 256-257, Weathering TE Only: 193b, Lesson 2 Check – Questions 5, 6; 215, 21 st Century Learning; 221b, Chapter 5 Test – Question 9

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Crosscutting Concepts	
CAUSE AND EFFECT	
Cause and effect relationships are routinely identified, tested, and used to explain change.	SE/TE: 244-245, Envision It!; 254-255, Envision It!; 256-257, Weathering; 258, Erosion; 260-265, Lesson 4; 276, Water Cycle and Weather; 278-279, Investigate It!; 290-293, Apply It! TE Only: 230, CCC: Cause and Effect; 258, Science Notebook; 265b, Lesson 4 Check – Question 6; 279a-279d, Activity Card Support; 295a, Performance Expectation Activity
4-ESS2-2 EARTH'S SYSTEM	
Performance Expectation	
Analyze and interpret data from maps to describe patterns of Earth's features.	TE Only: 295d, Chapter 6 Performance Expectation Activity
Clarification Statement	
Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.	
Science & Engineering Practices	
4. Analyzing and interpreting data: Analyzing data in 3–5 builds on K–2 experiences and progresses to introducing quantitative approaches to collecting data and conducting multiple trials of qualitative observations. When possible and feasible, digital tools should be used.	
<ul style="list-style-type: none"> Analyze and interpret data to make sense of phenomena using logical reasoning. 	SE/TE: 234-237, STEM Activity; 278-279, Investigate It!; TE Only: 279a-279d, Activity Card Support; 295b, Performance Expectation Activity;
Disciplinary Core Ideas	
PLATE TECTONICS AND LARGE-SCALE SYSTEM INTERACTIONS	
The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or near their edges. Maps can help locate the different land and water features of Earth. (UE.ESS2B.a)	SE/TE: 255, Earth's Surface; 260, My Planet Diary; 261, Earth's Moving Plates; 262, Volcanoes; 263, Earthquakes; 268-269, Surface Water; 280, The Galápagos Islands; 287, Chapter Review – Lesson 4; 295, Create a Booklet; 295, Make a Map TE Only: 262, 21 st Century Learning; 265a, My Planet Diary; 265b, Lesson 4 Check – Questions 1, 4, 5; 248, Science – Social Studies; 263, Science – Social Studies; 269, Science – Social Studies; 287b, Chapter 6 Test – Question 8; 295b, Performance Expectation Activity; 295b, ELA/Literacy

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Crosscutting Concepts	
PATTERNS	
Patterns can be used as evidence to support an explanation.	SE/TE: 244, Explore It!; 246-247, Igneous Rocks; 248-249, Sedimentary Rock; 252-253, The Rock Cycle; 254, Explore It!; 259, Deposition; 277, Water Cycle and Climate TE Only: 229c, Performance Expectation Activity; 295d, Performance Expectation Activity; 295d, ELA/Literacy
4-ESS2-3 EARTH'S SYSTEM	
Performance Expectation	
Ask questions that can be investigated and predict reasonable outcomes about how living things affect the physical characteristics of their environment.	SE/TE: 191, Animals Cause Change
Clarification Statement	
Investigations include making observations in various habitats in real life or virtual circumstances. Living things could include animals such as beavers, crawfish, armadillos, nutria, gophers, and plants such as kudzu, water hyacinth, and Chinese tallow.	
Science & Engineering Practices	
1. Asking questions and defining problems: Asking questions (science) and defining problems (engineering) in 3–5 builds on K–2 experiences and progresses to specifying qualitative relationships.	
<ul style="list-style-type: none"> Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. 	SE/TE: 373, Science, Engineering, and Technology Skills Handbook
Disciplinary Core Ideas	
BIOGEOLOGY	
Living things affect the physical characteristics of their environment. (UE.ESS2E.a)	SE/TE: 191, Animals Cause Change, 191
Crosscutting Concepts	
CAUSE AND EFFECT	
Cause and effect relationships are routinely identified, tested, and used to explain change.	SE/TE: 373, Science, Engineering, and Technology Skills Handbook

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4-ESS3-1 EARTH AND HUMAN ACTIVITY	
Performance Expectation	
Obtain and combine information to describe that energy and fuels are derived from renewable and non-renewable resources and how their uses affect the environment.	TE Only: 229d, Chapter 5 Performance Expectation Activity
Clarification Statement	
Examples of renewable energy resources could include wind energy, hydroelectric energy, and solar energy; non-renewable energy resources are fossil fuels. Examples of environmental effects could include loss of habitat due to dams, loss of habitat due to surface mining, and air pollution from burning fossil fuels.	
Science & Engineering Practices	
8. Obtaining, evaluating, and communicating information: Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.	
<ul style="list-style-type: none"> Obtain and combine information from books and/ or other reliable media to explain phenomena or solutions to a design problem. 	SE/TE: 45, Field Trip; 300-303, Do Research; 357, Design Process; 358, Step 2: Do Research TE Only: 13, 21 st Century Learning; 27, 21 st Century Learning; 32, 21 st Century Learning; 93, Science – Social Studies; 111b, ELA/Literacy; 111c, Performance Expectation Activity; 111d, Performance Expectation Activity; 111d, ELA/Literacy; 196, 21 st Century Learning; 229d, Performance Expectation Activity; 229d, ELA/Literacy
Disciplinary Core Ideas	
NATURAL RESOURCES	
Energy and fuels (fossil fuels, wind energy, solar energy, hydroelectric energy) that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. (UE.ESS3A.a)	SE/TE: 13, Go Green; 45, Field Trip; 194-199, Lesson 3; 211, Fossil Fuels; 220, Chapter Review – Lesson 3; 222, Benchmark Practice TE Only: 4, Background; 77, Build Enduring Understanding; 197, Professional Development Note; 199, Professional Development Note; 199a, Explore It!; 199b, Lesson 3 Check – Questions 1-6; 221a, Chapter 5 Test – Question 5; 221b, Chapter 5 Test – Questions 7, 9; 229d, Performance Expectation Activity; 230D, Harnessing Solar Energy; 230G-230H, Leveled Content Reader Support

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Crosscutting Concepts	
CAUSE AND EFFECT	
Cause and effect relationships are routinely identified, tested, and used to explain change.	SE/TE: 87, Electric Charges; 81, Let’s Read Science; 88, Cause and Effect; 91, Got It? – Question 11 TE Only: 11, Science Writing; 78, CCC: Energy and Matter; 93, ELL Support; 111e, Performance Expectation Activity; 111e, ELA/Literacy
4-ESS3-2 EARTH AND HUMAN ACTIVITY	
Performance Expectation	
Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	TE Only: 295c, Chapter 6 Performance Expectation Activity See also Grade 3, Chapter 6 STEM Activity and Lesson 6.4.
Clarification Statement	
Examples of solutions could include designing flood, wind, or earthquake resistant structures and models to prevent soil erosion.	
Science & Engineering Practices	
6. Constructing explanations and designing solutions: Constructing explanations (science) and designing solutions (engineering) in 3–5 builds on K–2 experiences and progresses to the use of evidence in constructing explanations that specify variables that describe and predict phenomena and in designing multiple solutions to design problems.	
<ul style="list-style-type: none"> Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. 	SE/TE: 234-237, STEM Activity; 357-363, Design Process TE Only: 295c, Performance Expectation Activity; 295c, ELA/Literacy
Disciplinary Core Ideas	
NATURAL HAZARDS	
A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (UE.ESS3B.a)	SE/TE: 260-265, Lesson 4; 295, Create a Booklet TE Only: 265a, My Planet Diary; 265b, Lesson 4 Check – Questions 2, 3, 6; 295c, Performance Expectation Activity; 295c, ELA/Literacy
DEVELOPING POSSIBLE SOLUTIONS TO ENGINEERING PROBLEMS	
Testing a solution involves investigating how well it performs under a range of likely conditions. (UE.ETS1B.d)	SE/TE: 234-237, STEM Activity TE Only: 295c, Performance Expectation Activity; 295c, ELA/Literacy

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Crosscutting Concepts	
CAUSE AND EFFECT	
Cause and effect relationships are routinely identified, tested, and used to explain change.	<p>SE/TE: 244-245, Envision It!; 254-255, Envision It!; 256-257, Weathering; 258, Erosion; 260-265, Lesson 4; 276, Water Cycle and Weather; 278-279, Investigate It!; 290-293, Apply It!</p> <p>TE Only: 230, CCC: Cause and Effect; 258, Science Notebook; 265b, Lesson 4 Check – Question 6; 279a-279d, Activity Card Support; 295a, Performance Expectation Activity</p>