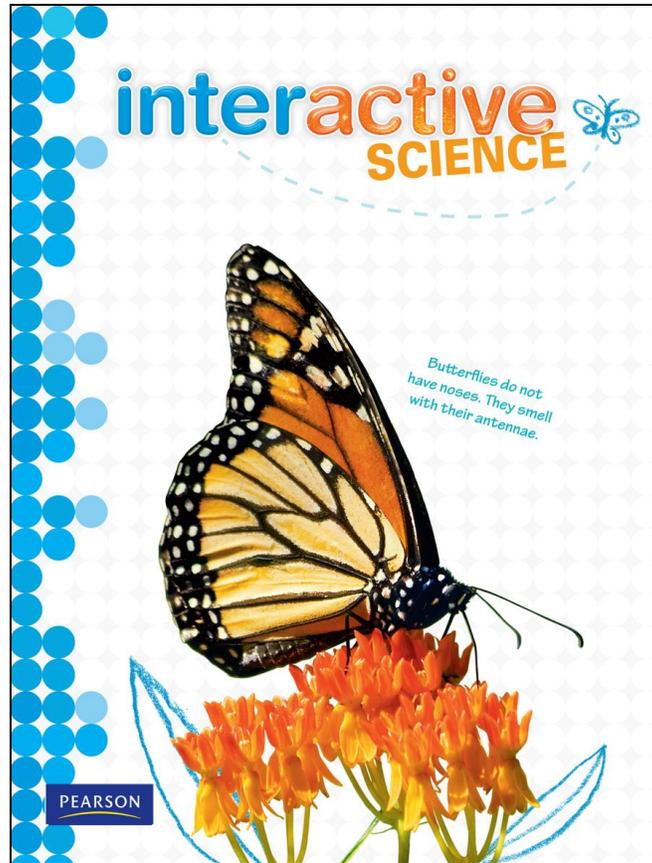# A Correlation of

Interactive Science
Grade 3, ©2016

To the

Arkansas Science Standards
Learning Progressions by Topic

A Correlation of Interactive Science, Grade 3, ©2016, to the
Arkansas Grade 3 Science Standards
Learning Progressions by Topic

Introduction

The following document demonstrates the close alignment of **Interactive Science,**
©2016, Grade 3 to the Arkansas Grade 3 Science Standards Learning Progressions by
Topic. Correlation references are to the Student Edition and Teacher's Edition.

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 edition of **Interactive Science** supports 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.
Science and Engineering Practices are further emphasized at each grade level in the Skills
Handbook portion of the Student Edition. 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.

Interactive Science Grade 3 Table of Contents

> Chapter 1 – Forces and Motion
> Chapter 2 – Energy and Its Forms
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> Chapter 4 – Living Things
> Chapter 5 – Ecosystems
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>
> Skills Handbook Part 1 – The Nature of Science
> Skills Handbook Part 2 – Technology and the Design Process

SE = Student Edition   TE = Teacher's Edition

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
Forces and Interactions	

Students who demonstrate understanding can: **3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.** [**AR** Clarification Statement: Examples could include an unbalanced force on one side of a box can make it start moving or balanced forces pushing on a box from both sides will not produce any motion at all.] [Assessment Boundary: Assessment is limited to one variable at a time: number, size, or direction of forces. Assessment does not include quantitative force size, only qualitative and relative. Assessment is limited to gravity being addressed as a force that pulls objects down.] **3-PS2-2 Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.** [Clarification Statement: Examples of motion with a predictable pattern could include a child swinging in a swing, a ball rolling back and forth in a bowl, and two children on a see-saw.] [Assessment Boundary: Assessment does not include technical terms such as period and frequency.] **3-PS2-3 Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.** [Clarification Statement: Examples of an electric force could include the force on hair from an electrically charged balloon or the electrical forces between a charged rod and pieces of paper; examples of a magnetic force could include the force between two permanent magnets, the force between an electromagnet and steel paperclips, and the force exerted by one magnet versus the force exerted by two magnets. Examples of cause and effect relationships could include how the distance between objects affects strength of the force or how the orientation of magnets affects the direction of the magnetic force.] [Assessment Boundary: Assessment is limited to forces produced by objects that can be manipulated by students, and electrical interactions are limited to static electricity.] **3-PS2-4 Define a simple design problem that can be solved by applying scientific ideas about magnets.*** [Clarification Statement: Examples of problems could include constructing a latch to keep a door shut and creating a device to keep two moving objects from touching each other.]	

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:	
Disciplinary Core Ideas	
PS2.A: Forces and Motion	
• Each force acts on one particular object and has both strength and a direction. An object at rest typically has multiple forces acting on it, but they add to give zero net force on the object. Forces that do not sum to zero can cause changes in the object's speed or direction of motion. (Boundary: Qualitative and conceptual, but not quantitative addition of forces are used at this level.) (3-PS2-1)	**SE/TE:** 1, 2, 15-19, 29-32, 34, 99 **TE only:** 1G-1H, 1I, 13b, 21b, 99a

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
• The patterns of an object's motion in various situations can be observed and measured; when that past motion exhibits a regular pattern, future motion can be predicted from it. (Boundary: Technical terms, such as magnitude, velocity, momentum, and vector quantity, are not introduced at this level, but the concept that some quantities need both size and direction to be described is developed.) (3-PS2-2)	**SE/TE:** 10, 12-13, 26-27, 29-32, 33, 34 **TE only:** 1G-1H, 13b, 27a, 27b, 27c, 27d, 99b
PS2.B: Types of Interactions	
• Objects in contact exert forces on each other. (3-PS2-1)	**SE/TE:** 15, 16, 33, 34 **TE only:** 1G-1H, 21b
• Electric and magnetic forces between a pair of objects do not require that the objects be in contact. The sizes of the forces in each situation depend on the properties of the objects and their distances apart and, for forces between two magnets, on their orientation relative to each other. (3-PS2-3, 3-PS2-4)	**SE/TE:** 2, 15, 20-21, 29-32, 33, 77, 89 **TE only:** 21b, 99c, 99d
Connections to other DCIs in third grade: N/A	

Connections to other DCIs across grade levels: **K.PS2.A** (3-PS2-1); **K.PS2.B** (3-PS2-1); **K.PS3.C** (3-PS2-1); **K-2.ETS1.A** (3-PS2-4); **1.ESS1.A** (3-PS2-2); **4.PS4.A** (3-PS2-2); **3-5.ETS1.A** (3-PS2-4); **5.PS2.B** (3-PS2-1); **7.ESS2.C** (3-PS2-1); **8.PS2.A** (3-PS2-1, 3-PS2-2); **8.PS2.B** (3-PS2-3, 3-PS2-4); **8.ESS1.B** (3-PS2-1, 3-PS2-2)

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
Common Core State Standards Connections *ELA/Literacy –* **RI.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-PS2-1, 3-PS2-3) **RI.3.3** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-PS2-3) **RI.3.8** Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence). (3-PS2-3) **W.3.7** Conduct short research projects that build knowledge about a topic. (3-PS2-1, 3-PS2-2) **W.3.8** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-PS2-1, 3-PS2-2) **SL.3.3** Ask and answer questions about information from a speaker, offering appropriate elaboration and detail. (3-PS2-3) *Mathematics –* **MP.2** Reason abstractly and quantitatively. (3-PS2-1) **MP.5** Use appropriate tools strategically. (3-PS2-1) **3.MD.A.2** Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3-PS2-1)	
Crosscutting Concepts	
Patterns	
• Patterns of change can be used to make predictions. (3-PS2-2)	**SE/TE:** 12, 14, 25, 34 **TE only:** 99b
Cause and Effect	
• Cause and effect relationships are routinely identified. (3-PS2-1)	**SE/TE:** 2, 4-7, 21, 26-27, 35 **TE only:** 99a, 99c
• Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)	**SE/TE:** 2, 4-7, 26-27 **TE only:** 99a, 99c
Connections to Engineering, Technology, and Applications of Science	
Interdependence of Science, Engineering, and Technology	
• Scientific discoveries about the natural world can often lead to new and improved technologies, which are developed through the engineering design process. (3-PS2-4)	**SE/TE:** 4-7, 339, 341, 347, 348-349, 357-361, 369, 371 **TE only:** 99d

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
Science and Engineering Practices	
Asking Questions and Defining Problems Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.	
• Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3)	**SE/TE:** 99, 298-300, 310 **TE only:** 39, 99c
• Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4)	**SE/TE:** 4-7, 99, 292, 294-297, 340, 342-344, 346-349, 350, 356-361, 362-363, 374-379 **TE only:** 99d
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions 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.	
• 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. (3-PS2-1)	**SE/TE:** 4-7, 22, 99, 292, 294-297, 340, 342-344, 350, 356-361, 362-363, 374-379 **TE only:** 25a, 25b, 99a
• 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. (3-PS2-2)	**SE/TE:** 10, 22, 26-27, 99, 362-363 **TE only:** 99a, 99d
Connections to Nature of Science	
Science Knowledge is Based on Empirical Evidence	
• Science findings are based on recognizing patterns. (3-PS2-2)	**SE/TE:** 10, 22 **TE only:** 25a, 25b, 99b
Scientific Investigations Use a Variety of Methods	
• Science investigations use a variety of methods, tools, and techniques. (3-PS2-1)	**SE/TE:** 4-7, 26-27, 292, 294-297, 340, 342-344, 350, 356-361, 362-363, 374-379 **TE only:** 99a

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
Interdependent Relationships in Ecosystems	
Students who demonstrate understanding can: **3-LS2-1 Construct an argument that some animals form groups that help members survive.** [**AR** Clarification Statement: Examples could include ant colonies, herds of bison, or hives of bees.] **3-LS4-1 Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.** [Clarification Statement: Examples of data could include type, size, and distributions of fossilized organisms. Examples of fossils and environments could include marine fossils found on dry land, tropical plant fossils found in Arctic areas, and fossils of extinct organisms.] [Assessment Boundary: Assessment does not include identification of specific fossils or living plants and animals. Assessment is limited to major fossil types and relative ages.] **3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.** [**AR** Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other for survival.] **3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.*** [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]	
The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:	
Disciplinary Core Ideas	
LS2.C: Ecosystem Dynamics, Functioning, and Resilience	
• When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (3-LS4-4)	**SE/TE:** 209, 215, 216-223, 235, 237, 244 **TE only:** 196G-196H, 223a, 223b, 245h
LS2.D: Social Interactions and Group Behavior	
• Being part of a group helps animals obtain food, defend themselves, and cope with changes. Groups may serve different functions and vary dramatically in size. (3-LS2-1)	**SE/TE:** 208, 219 **TE only:** 245f
LS4.A: Evidence of Common Ancestry and Diversity	
• Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (3-LS4-1)	**SE/TE:** 225, 231-232, 233, 237 **TE only:** 219, 227b

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Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
• Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)	**SE/TE:** 224-227, 233, 237, 238 **TE only:** 227a, 227b, 245e
LS4.C: Adaptation	
• For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3)	**SE/TE:** 217, 221, 231-234, 237, 240-243 **TE only:** 233b, 245b, 245g
LS4.D: Biodiversity and Humans	
• Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)	**SE/TE:** 205, 208, 219, 231, 232 **TE only:** 245h
Connections to other DCIs in third grade: **3.ESS2.D** (3-LS4-3); **3.ESS3.B** (3-LS4-4)	
Connections to other DCIs across grade levels: **K.ESS3.A** (3-LS4-3, 3-LS4-4); **K-2.ETS1.A** (3-LS4-4); **1.LS1.B** (3-LS2-1); **2.LS2.A** (3-LS4-3, 3-LS4-4); **2.LS4.D** (3-LS4-3, 3-LS4-4); **4.ESS1.C** (3-LS4-1); **4.ESS3.B** (3-LS4-4); **3-5.ETS1.A** (3-LS4-4); **6.ESS3.C** (3-LS4-4); **7.LS2.A** (3-LS2-1, 3-LS4-1, 3-LS4-3, 3-LS4-4); **7.LS2.C** (3-LS4-4); **7.ESS2.B** (3-LS4-1); **8.LS4.A** (3-LS4-1); **8.LS4.B** (3-LS4-3); **8.LS4.C** (3-LS4-3, 3-LS4-4); **8.ESS1.C** (3-LS4-1, 3-LS4-3, 3-LS4-4)	

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Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
Common Core State Standards Connections: *ELA/Literacy –* **RI.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS2-1, 3-LS4-1, 3-LS4-3, 3-LS4-4) **RI.3.2** Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS4-1, 3-LS4-3, 3-LS4-4) **RI.3.3** Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS2-1, 3-LS4-1, 3-LS4-3, 3-LS4-4) **W.3.1** Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-LS2-1, 3-LS4-1, 3-LS4-3, 3-LS4-4) **W.3.2** Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS4-1, 3-LS4-3, 3-LS4-4) **W.3.8** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-LS4-1) **SL.3.4** Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS4-3, 3-LS4-4) *Mathematics –* **MP.2** Reason abstractly and quantitatively. (3-LS4-1, 3-LS4-3, 3-LS4-4) **MP.4** Model with mathematics. (3-LS2-1, 3-LS4-1, 3-LS4-3, 3-LS4-4) **MP.5** Use appropriate tools strategically. (3-LS4-1) **3.NBT** Number and Operations in Base Ten (3-LS2-1) **3.MD.B.3** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. (3-LS4-3) **3.MD.B.4** Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS4-1)	
Crosscutting Concepts	
Cause and Effect	
• Cause and effect relationships are routinely identified and used to explain change. (3-LS2-1, 3-LS4-3)	**SE/TE:** 199, 210, 216, 217 **TE only:** 75a, 215a, 215b, 223a, 223b
Scale, Proportion, and Quantity	
• Observable phenomena exist from very short to very long time periods. (3-LS4-1)	**SE/TE:** 219, 220, 221, 222-223 **TE only:** 207, 245h
Systems and System Models	
• A system can be described in terms of its components and their interactions. (3-LS4-4)	**SE/TE:** 197, 204-209, 214, 215, 228-229, 230, 235, 236 **TE only:** 196G-196H, 196, 209b, 229a, 229c, 229d

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
Connections to Engineering, Technology, and Applications of Science	
Interdependence of Science, Engineering, and Technology	
• Knowledge of relevant scientific concepts and research findings is important in engineering. (3-LS4-4)	**SE/TE:** 294-297, 340, 342-345, 346, 348-349, 357-361, 362-363
Connections to Nature of Science	
Scientific Knowledge Assumes an Order and Consistency in Natural Systems	
• Science assumes consistent patterns in natural systems. (3-LS4-1)	**SE/TE:** 212-213, 214, 215, 222-223
Science and Engineering Practices	
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.	
• Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS4-1)	**SE/TE:** 342-345 **TE only:** 245c, 245e
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 worlds.	
• Construct an argument with evidence, data, and/or a model. (3-LS2-1)	**SE/TE:** 216, 244, 245 **TE only:** 197, 223a, 245f, 245g, 289c
• Construct an argument with evidence. (3-LS4-3)	**SE/TE:** 244, 245, 288 **TE only:** 245f, 245g, 289c
• Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem. (3-LS4-4)	**SE/TE:** 203, 297, 345, 361 **TE only:** 245h, 289c

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
Inheritance and Variation of Traits: Life Cycles and Traits	

Students who demonstrate understanding can:

3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. [Clarification Statement: Changes organisms go through during their life form a pattern.] [Assessment Boundary: Assessment of plant life cycles is limited to those of flowering plants. Assessment does not include details of human reproduction.]

3-LS3-1 Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms. [Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.]

3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment. [Clarification Statement: Examples of the environment affecting a trait could include insufficient water stunting normally tall plants; and, a pet dog becoming overweight that is given too much food and too little exercise.]

3-LS4-2 Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing. [**AR** Clarification Statement: Examples of cause and effect relationships could be plants of the same species with larger thorns may be less likely to be eaten; and, animals of the same species with more effective camouflage or coloration may be more likely to survive and produce offspring.]

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

Disciplinary Core Ideas	
LS1.B: Growth and Development of Organisms	
• Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)	**SE/TE:** 128-133, 134-139, 143, 145, 176-183, 191, 193, 245 **TE only:** 133a, 133b, 139a, 139b, 183a, 183b, 245a
LS3.A: Inheritance of Traits	
• Many characteristics of organisms are inherited from their parents. (3-LS3-1)	**SE/TE:** 129, 169-172, 245 **TE only:** 175a, 175b, 245a, 245c
• Other characteristics result from individuals' interactions with the environment, which can range from diet to learning. Many characteristics involve both inheritance and environment. (3-LS3-2)	**SE/TE:** 168, 171-173, 175 **TE only:** 175b, 182, 245d

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
LS3.B: Variation of Traits	
• Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)	**SE/TE:** 169, 174 **TE only:** 245c
• The environment also affects the traits that an organism develops. (3-LS3-2)	**SE/TE:** 171, 173, 245 **TE only:** 245d
LS4.B: Natural Selection	
• Sometimes the differences in characteristics between individuals of the same species provide advantages in surviving, finding mates, and reproducing. (3-LS4-2)	**SE/TE:** 170, 171, 174-175 **TE only:** 245b, 245c

Connections to other DCIs in third grade: **3.LS4.C** (3-LS4-2)

Connections to other DCIs across grade levels: **1.LS3.A** (3-LS3-1, 3-LS4-2); **1.LS3.B** (3-LS3-1); **6.LS1.B** (3-LS1-1, 3-LS3-2); **6.LS3.B** (3-LS3-1, 3-LS4-2); **7.LS2.A** (3-LS4-2); **8.LS3.A** (3-LS3-1); **8.LS4.B** (3-LS4-2)

Common Core State Standards Connections:
ELA/Literacy –
RI.3.1   Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-LS3-1, 3-LS3-2, 3-LS4-2)
RI.3.2   Determine the main idea of a text; recount the key details and explain how they support the main idea. (3-LS3-1, 3-LS3-2, 3-LS4-2)
RI.3.3   Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect. (3-LS3-1, 3-LS3-2, 3-LS4-2)
RI.3.7   Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-LS1-1)
W.3.2   Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1, 3-LS3-2, 3-LS4-2)
SL.3.4   Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace. (3-LS3-1, 3-LS3-2, 3-LS4-2)
SL.3.5   Create engaging audio recordings of stories or poems that demonstrate fluid reading at an understandable pace; add visual displays when appropriate to emphasize or enhance certain facts or details. (3-LS1-1)

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Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
(Continued) *Mathematics –* **MP.2**　　Reason abstractly and quantitatively. (3-LS3-1, 3-LS3-2, 3-LS4-2) **MP.4**　　Model with mathematics. (3-LS1-1, 3-LS3-1, 3-LS3-2, 3-LS4-2) **3.NBT**　　Number and Operations in Base Ten (3-LS1-1) **3.NF**　　Number and Operations—Fractions (3-LS1-1) **3.MD.B.3**　Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. (3-LS4-2) **3.MD.B.4**　Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units—whole numbers, halves, or quarters. (3-LS3-1, 3-LS3-2)	
Crosscutting Concepts	
Patterns	
• Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1)	**SE/TE:** 154, 183, 184-185
• Patterns of change can be used to make predictions. (3-LS1-1)	**SE/TE:** 101, 102
Cause and Effect	
• Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2, 3-LS4-2)	**SE/TE:** 116, 138 **TE only:** 121a, 121b
Science and Engineering Practices	
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.	
• Develop models to describe phenomena. (3-LS1-1)	**SE/TE:** 312 **TE only:** 245a

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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.	
• Analyze and interpret data to make sense of phenomena using logical reasoning. (3-LS3-1)	**SE/TE:** 342-345 **TE only:** 245c, 245e
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions 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.	
• Use evidence (e.g., observations, patterns) to support an explanation. (3-LS3-2)	**SE/TE:** 102, 106-107, 116, 176, 307, 328 **TE only:** 121a, 245b, 245d, 245g, 247
• Use evidence (e.g., observations, patterns) to construct an explanation. (3-LS4-2)	**SE/TE:** 107, 120, 122, 128, 138, 140-141, 176, 195, 328 **TE only:** 121a, 127a, 196E, 245d, 245g
Connections to Nature of Science	
Scientific Knowledge is Based on Empirical Evidence	
• Science findings are based on recognizing patterns. (3-LS1-1)	**SE/TE:** 102, 119, 136, 137, 154, 184-185 **TE only:** 152

Arkansas Science Standards Learning Progressions by Topic	Interactive Science Grade 3, ©2016
Weather and Climate	
Students who demonstrate understanding can: **3-ESS2-1 Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season.** [Clarification Statement: Examples of data could include average temperature, precipitation, and wind direction.] [Assessment Boundary: Assessment of graphical displays is limited to pictographs and bar graphs. Assessment does not include climate change.] **3-ESS2-2 Obtain and combine information to describe climates in different regions of the world.** **3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.*** [Clarification Statement: Examples of design solutions to weather-related hazards could include barriers to prevent flooding, wind resistant roofs, and lightning rods.]	
The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:	
Disciplinary Core Ideas	
ESS2.D: Weather and Climate	
• Scientists record patterns of the weather across different times and areas so that they can make predictions about what kind of weather might happen next. (3-ESS2-1)	**SE/TE:** 247, 258-261, 266-269, 283, 289, 303, 307 **TE only:** 246G-246H, 246, 265a, 265b, 269a, 269b,
• Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)	**SE/TE:** 260-265, 279, 281-282 **TE only:** 246G-246H, 265b, 289b
ESS3.B: Natural Hazards	
• A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1)	**SE/TE:** 249, 250, 253, 270, 271-275, 279-280, 281, 283, 288, 303, 307 **TE only:** 246G-246H, 275a, 275b, 289c
Connections to other DCIs in third grade: N/A	
Connections to other DCIs across grade levels: **K.ESS2.D** (3-ESS2-1); **K.ESS3.B** (3-ESS3-1); **K-2.ETS1.A** (3-ESS3-1); **4.ESS2.A** (3-ESS2-1); **4.ESS3.B** (3-ESS3-1); **3-5.ETS1.A** (3-ESS3-1); **5.ESS2.A** (3-ESS2-1); **6.ESS2.D** (3-ESS2-1, 3-ESS2-2); **7.ESS2.C** (3-ESS2-1, 3-ESS2-2); **7.ESS3.B** (3-ESS3-1)	

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Common Core State Standards Connections: *ELA/Literacy –* **RI.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-ESS2-2) **RI.3.9** Compare and contrast the most important points and key details presented in two texts on the same topic. (3-ESS2-2) **W.3.1** Write opinion pieces on topics or texts, supporting a point of view with reasons. (3-ESS3-1) **W.3.7** Conduct short research projects that build knowledge about a topic. (3-ESS3-1) **W.3.8** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-ESS2-2) *Mathematics –* **MP.2** Reason abstractly and quantitatively. (3-ESS2-1, 3-ESS2-2, 3-ESS3-1) **MP.4** Model with mathematics. (3-ESS2-1, 3-ESS2-2, 3-ESS3-1) **MP.5** Use appropriate tools strategically. (3-ESS2-1) **3.MD.A.2** Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3-ESS2-1) **3.MD.B.3** Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in bar graphs. (3-ESS2-1)	
Crosscutting Concepts	
Patterns	
• Patterns of change can be used to make predictions. (3-ESS2-1, 3-ESS2-2)	**SE/TE:** 248, 283 **TE only:** 246G-246H, 246, 289a, 289b
Cause and Effect	
• Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1)	**SE/TE:** 248, 262, 263
Connections to Engineering, Technology, and Applications of Science	
Influence of Engineering, Technology, and Science on Society and the Natural World	
• Engineers improve existing technologies or develop new ones to increase their benefits (e.g., better artificial limbs), decrease known risks (e.g., seatbelts in cars), and meet societal demands (e.g., cell phones). (3-ESS3-1)	**SE/TE:** 341, 346-349, 359, 364

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Connections to Nature of Science	
Science is a Human Endeavor	
• Science affects everyday life. (3-ESS3-1)	**SE/TE:** 291, 299, 300, 303, 304, 305, 307, 309, 312, 313, 337, 348-349 **TE only:** 246G-246H
Science and Engineering Practices	
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.	
• Represent data in tables and various graphical displays (bar graphs and pictographs) to reveal patterns that indicate relationships. (3-ESS2-1)	**SE/TE:** 268, 289, 314 **TE only:** 247, 277a, 289a, 319a, 327a
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).	
• Make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.(3-ESS3-1)	**SE/TE:** 252-253, 297, 345, 361 **TE only:** 289c
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.	
• Obtain and combine information from books and other reliable media to explain phenomena. (3-ESS2-2)	**SE/TE:** 250-251, 294-295, 342-343, 358 **TE only:** 289a, 289b

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Engineering, Technology, and Applications of Science	
Students who demonstrate understanding can: **3-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.** **3-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.** **3-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.**	
The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*:	
Disciplinary Core Ideas	
ETS1.A: Defining and Delimiting Engineering Problems	
• Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. (3-ETS1-1)	**SE/TE:** 4-7, 42-45, 104-107, 156-159, 200-203, 250-253, 294-297, 342-345, 357-361, 374-379 **TE only:** 361b
ETS1.B: Developing Possible Solutions	
• Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-ETS1-2)	**SE/TE:** 4-5, 42, 104-105, 156-157, 200-201, 250-251, 294-295, 342-343, 358, 375, 378 **TE:** 55
• At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-ETS1-2)	**SE/TE:** 7, 107, 345 **TE only:** 5, 6, 43, 44, 105, 106, 157, 158, 201, 202, 251, 252, 295, 296, 343, 344
• Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-ETS1-3)	**SE/TE:** 6, 7, 44, 45, 106, 158, 203, 252, 296, 345, 376-379

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ETS1.C: 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. (3-ETS1-3)	**SE/TE:** 7, 45, 107, 159, 203, 252-253, 297, 345, 361, 375-376
Connections to 3-5-ETS1.A: Defining and Delimiting Engineering Problems include: **Fourth Grade:** (4-PS3-4) *Connections to 3-5-ETS1.B: Designing Solutions to Engineering Problems include:* **Fourth Grade:** (4-ESS3-2) *Connections to 3-5-ETS1.C: Optimizing the Design Solution include:* **Fourth Grade:** (4-PS4-3)*	
Connections to other DCIs across grade levels: **K-2.ETS1.A** (3-ETS1-1, 3-ETS1-2, 3-ETS1-3); **K-2.ETS1.B** (3-ETS1-2); **K-2.ETS1.C** (3-ETS1-2, 3-ETS1-3); **6-8.ETS1.A** (3-ETS1-1); **6-8.ETS1.B** (3-ETS1-1, 3-ETS1-2, 3-ETS1-3); **6-8.ETS1.C** (3-ETS1-2, 3-ETS1-3)	
Common Core State Standards Connections: ELA/Literacy – **RI.3.1** Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers. (3-ETS1-2) **RI.3.7** Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur). (3-ETS1-2) **RI.3.9** Compare and contrast the most important points and key details presented in two texts on the same topic. (3-ETS1-2) **W.3.7** Conduct short research projects that build knowledge about a topic. (3-ETS1-1, 3-ETS1-3) **W.3.8** Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories. (3-ETS1-1, 3-ETS1-3) *Mathematics –* **MP.2** Reason abstractly and quantitatively. (3-ETS1-1, 3-ETS1-2, 3-ETS1-3) **MP.4** Model with mathematics. (3-ETS1-1, 3-ETS1-2, 3-ETS1-3) **MP.5** Use appropriate tools strategically. (3-ETS1-1, 3-ETS1-2, 3-ETS1-3) **3-5.OA** Operations and Algebraic Thinking (3-ETS1-1, 3-ETS1-2)	
Crosscutting Concepts	
Influence of Science, Engineering, and Technology on Society and the Natural World	
• People's needs and wants change over time, as do their demands for new and improved technologies. (3-ETS1-1)	**SE/TE:** 28, 198, 337, 346, 348, 349, 361
• Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-ETS1-2)	**SE/TE:** 28, 84, 341, 346, 347, 348, 349, 359, 364

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Science and Engineering Practices	
Asking Questions and Defining Problems Asking questions and defining problems in 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships.	
• Define a simple design problem that can be solved through the development of an object, tool, process, or system and includes several criteria for success and constraints on materials, time, or cost. (3-ETS1-1)	**SE/TE:** 4, 42, 104, 156, 200, 250, 294, 342, 358, 374
Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions 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.	
• 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. (3-ETS1-3)	**SE/TE:** 4-7, 40, 42-45, 104-107, 156-159, 200-203, 250-252, 292, 294-297, 340, 342-344, 350, 356-361, 362-363, 374-379
Constructing Explanations and Designing Solutions Constructing explanations and designing solutions 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.	
• Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem. (3-ETS1-2)	**SE/TE:** 4-7, 42-45, 104-107, 156-159, 200-203, 250-252, 292, 294-297, 340, 342-344, 346-349, 350, 356-361, 362-363, 374-379

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