twig SCIENCE Grade 5 Scope and Sequence

ASSESSMENT All modules include: Pre-Exploration, Formative Assessment, Performance Task, Multiple Choice Assessment, and Benchmark Assessment

MODULES	MODULE ANCHOR PHENOMENON	STORYLINE	PERFORMANCE EXPECTATIONS (*PEs that integrate traditional science content with engineering through SEPs or DCIs)	NGSS		CROSS-CURRICULAR CONNECTIONS	
1: Matter Mysteries Hotline **NGSS Topic Arrangements: Structure and Properties of Matter; Engineering Design** 	What is matter made of?	Got a science mystery you need to solve? Then call the Matter Mysteries Hotline—a one-stop service for people in need of specialist scientific help. As trainee recruits, students use their science skills to answer a series of matter-related queries. They test mystery materials to help a private investigator, choose the best materials to make an explorer's kit bag, investigate chemical reactions when a Fire and Rescue team find an unidentified substance in a school, and help a Hollywood special effects department create the perfect clay. Let's find out why matter matters!	**5-PS1-1** Develop a model to describe that matter is made of particles too small to be seen. **5-PS1-2** Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved. **5-PS1-3** Make observations and measurements to identify materials based on their properties. **5-PS1-4** Conduct an investigation to determine whether the mixing of two or more substances results in new substances. **3–5-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.	**Crosscutting Concepts** **CCC-2** Cause and Effect **CCC-3** Scale, Proportion, and Quantity **CCC-5** Energy and Matter **CCC-6** Structure and Function **Disciplinary Core Ideas** **PS1.A** Structure and Properties of Matter **PS1.B** Chemical Reactions **Engineering, Technology, and Applications of Science** **ETS1.B** Developing Possible Solutions **ETS1.C** Optimizing the Design Solution	**Science and Engineering Practices** **SEP-2** Developing and Using Models **SEP-3** Planning and Carrying Out Investigations **SEP-4** Analyzing and Interpreting Data **SEP-5** Using Mathematics and Computational Thinking **SEP-6** Constructing Explanations and Designing Solutions **SEP-7** Engaging in Argument from Evidence **SEP-8** Obtaining, Evaluating, and Communicating Information	**Common Core English Language Arts** **RI.5.1–3** Key Ideas and Details **RI.5.8** Integration of Knowledge and Ideas **RI.5.10** Range of Reading and Level of Text Complexity **SL.5.1–3** Comprehension and Collaboration **SL.5.5–6** Presentation of Knowledge and Ideas **W.5.1–2** Text Types and Purposes **W.5.4–5** Production and Distribution of Writing **W.5.7–9** Research to Build and Present Knowledge **WIDA English Language Development** **Standard 1:** Social and Instructional Language **Standard 2:** The Language of Language Arts **Standard 3:** The Language of Mathematics **Standard 4:** The Language of Science **English Language Proficiency Domains** Speaking, Listening, Reading, Writing	**Common Core Math** **5.MD.A** Convert like measurement units within a given measurement system **5.MD.B** Represent and interpret data **5.MD.C** Geometric measurement: understand concepts of volume **5.NBT.B** Perform operations with multi-digit whole numbers and with decimals to hundredths **MP5** Use appropriate tools strategically **MP6** Attend to precision **MP8** Look for and express regularity in repeated reasoning
2: Yellowstone: Uncovered **NGSS Topic Arrangements: Matter and Energy in Organisms and Ecosystems** 	How do matter and energy move through an ecosystem?	Yellowstone is one of the United States' largest and wildest national parks—and you're about to see a side of it that isn't on the tourist trail! Students become park rangers to investigate how matter and energy move through systems. They observe predators hunting prey, discover the organisms that recycle the dead, and learn how plants create their own food. As students explore the relationships between the plants and animals that live in Yellowstone, they discover how even small changes to an environment can have big impacts.	**5-LS1-1** Support an argument that plants get the materials they need for growth chiefly from air and water. **5-LS2-1** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. **5-PS3-1** Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun.	**Crosscutting Concepts** **CCC-2** Cause and Effect **CCC-3** Scale, Proportion, and Quantity **CCC-4** System and System Models **CCC-5** Energy and Matter **CCC-7** Stability and Change **Disciplinary Core Ideas** **LS1.C** Organization for Matter and Energy Flow in Organisms **LS2.A** Interdependent Relationships in Ecosystems **LS2.B** Cycles of Matter and Energy Transfer in Ecosystems **PS3.D** Energy in Chemical Processes and Everyday Life	**Science and Engineering Practices** **SEP-1** Asking Questions and Defining Problems **SEP-2** Developing and Using Models **SEP-3** Planning and Carrying Out Investigations **SEP-4** Analyzing and Interpreting Data **SEP-5** Using Mathematics and Computational Thinking **SEP-6** Constructing Explanations and Designing Solutions **SEP-7** Engaging in Argument from Evidence **SEP-8** Obtaining, Evaluating, and Communicating Information **Environmental Principles and Concepts** **Principle II** People influence natural systems **Principle III** Natural systems change in ways that people benefit from and can influence	**Common Core English Language Arts** **L.5.6** Vocabulary Acquisition and Use **RI.5.1–3** Key Ideas and Details **RI.5.4–6** Craft and Structure **RI.5.7–8** Integration of Knowledge and Ideas **RI.5.10** Range of Reading and Level of Text Complexity **SL.5.1–2** Comprehension and Collaboration **SL.5.5** Presentation of Knowledge and Ideas **W.5.1** Text Types and Purposes **W.5.4–5** Production and Distribution of Writing **W.5.8–9** Research to Build and Present Knowledge **W.5.10** Range of Writing **WIDA English Language Development** **Standard 1:** Social and Instructional Language **Standard 2:** The Language of Language Arts **Standard 3:** The Language of Mathematics **Standard 4:** The Language of Science	**English Language Proficiency Domains** Speaking, Listening, Reading, Writing **Common Core Math** **5.NBT.B** Perform operations with multi-digit whole numbers and with decimals to hundredths **5.MD.B** Represent and interpret data **MP1** Make sense of problems and persevere in solving them. **MP3** Construct viable arguments and critique the reasoning of others **MP4** Model with mathematics **MP5** Use appropriate tools strategically
3: H2O Response Team **NGSS Topic Arrangements: Earth's Systems; Engineering Design** 	What can we do to protect Earth's systems?	Welcome to the H2O Response Team! Students become hydrologists, tasked with investigating the growing issue of water scarcity. Students explore where water is found around the world, and discover just how little of it is drinkable. They investigate the many ways we use water, and consider the threat posed by water shortages—including droughts in California. Students then use what they've learned about sustainability to devise and implement a water campaign. Remember: every drop counts!	**5-ESS2-1** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. **5-ESS2-2** Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. **5-ESS3-1** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. **3–5-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. **3–5-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. **3–5-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.	**Crosscutting Concepts** **CCC-1** Patterns **CCC-2** Cause and Effect **CCC-3** Scale, Proportion, and Quantity **CCC-4** System and System Models **Disciplinary Core Ideas** **ESS2.A** Earth Materials and Systems **ESS2.C** The Roles of Water in Earth's Surface Processes **ESS3.C** Human Impacts on Earth Systems **Engineering, Technology, and Applications of Science** **ETS1.A** Defining and Delimiting Engineering Problems **ETS1.B** Developing Possible Solutions **ETS1.C** Optimizing the Design Solution	**Science and Engineering Practices** **SEP-1** Asking Questions and Defining Problems **SEP-2** Developing and Using Models **SEP-3** Planning and Carrying Out Investigations **SEP-4** Analyzing and Interpreting Data **SEP-5** Using Mathematics and Computational Thinking **SEP-6** Constructing Explanations and Designing Solutions **SEP-8** Obtaining, Evaluating, and Communicating Information **Environmental Principles and Concepts** **Principle I** People depend on natural systems **Principle II** People influence natural systems **Principle IV** There are no permanent or impermeable boundaries that prevent matter from flowing between systems **Principle V** Decisions affecting resources and natural systems are complex and involve many factors	**Common Core English Language Arts** **L.5.6** Vocabulary Acquisition and Use **RI.5.1–3** Key Ideas and Details **RI.5.4** Craft and Structure **RI.5.7–9** Integration of Knowledge and Ideas **RI.5.10** Range of Reading and Level of Text Complexity **SL.5.1–2** Comprehension and Collaboration **SL.5.4** Presentation of Knowledge and Ideas **W.5.2** Text Types and Purposes **W.5.5** Production and Distribution of Writing **W.5.7–9** Research to Build and Present Knowledge **W.5.10** Range of Writing **WIDA English Language Development** **Standard 1:** Social and Instructional Language **Standard 2:** The Language of Language Arts **Standard 3:** The Language of Mathematics **Standard 4:** The Language of Science	**English Language Proficiency Domains** Speaking, Listening, Reading, Writing **Common Core Math** **5.NBT.A** Understand the place value system **5.MD.A** Convert like measurement units within a given measurement system. **MP2** Reason abstractly and quantitatively **MP4** Model with mathematics **MP5** Use appropriate tools strategically **MP6** Attend to precision
4: Galactic Guidebook **NGSS Topic Arrangements: Space Systems** 	What patterns do we notice when we observe the stars?	Students join a community of international star-spotters, and report on the patterns they see in the night sky. They investigate why some stars are brighter than others, why we only see them at night, and how stars seem to move across the sky. They discover how the night sky can be used for navigation, explore the constellations, and investigate why we don't fall off the Earth! Using these explorations and observations, students create their own Galactic Guidebook—a record of patterns in the sky and in their own lives. It'll be out of this world!	**5-PS2-1** Support an argument that the gravitational force exerted by Earth on objects is directed down. **5-ESS1-2** Represent data in graphical displays to reveal patterns of daily changes in the length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky. **5-ESS1-1** Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distance from Earth.	**Crosscutting Concepts** **CCC-1** Patterns **CCC-2** Cause and Effect **CCC-3** Scale, Proportion, and Quantity **CCC-4** System and System Models **CCC-7** Stability and Change **Disciplinary Core Ideas** **PS2.B** Types of Interactions **ESS1.A** The Universe and Its Stars **ESS1.B** Earth and the Solar System	**Science and Engineering Practices** **SEP-2** Developing and Using Models **SEP-3** Planning and Carrying Out Investigations **SEP-4** Analyzing and Interpreting Data **SEP-5** Using Mathematics and Computational Thinking **SEP-6** Constructing Explanations and Designing Solutions **SEP-7** Engaging in Argument from Evidence **SEP-8** Obtaining, Evaluating, and Communicating Information **Environmental Principles and Concepts** **Principle I** People depend on natural systems	**Common Core English Language Arts** **L.5.4, 6** Vocabulary Acquisition and Use **RI.5.1–3** Key Ideas and Details **RI.5.4** Craft and Structure **RI.5.8** Integration of Knowledge and Ideas **RI.5.10** Range of Reading and Level of Text Complexity **SL.5.1–2** Comprehension and Collaboration **SL.5.4–5** Presentation of Knowledge and Ideas **W.5.1–2** Text Types and Purposes **W.5.4–6** Production and Distribution of Writing **W.5.7–8** Research to Build and Present Knowledge **W.5.10** Range of Writing **English Language Proficiency Domains** Speaking, Listening, Reading, Writing	**WIDA English Language Development** **Standard 1:** Social and Instructional Language **Standard 2:** The Language of Language Arts **Standard 3:** The Language of Mathematics **Standard 4:** The Language of Science **Common Core Math** **5.MD.B** Represent and interpret data **5.NBT.A** Understand the place value system **MP1** Make sense of problems and persevere in solving them **MP3** Construct viable arguments and critique the reasoning of others **MP4** Model with mathematics **MP6** Attend to precision **MP7** Look for and make use of structure