twig SCIENCE Grade 1 Scope and Sequence

ASSESSMENT All modules include: Pre-Exploration, Formative Assessment, Performance Task, and Multiple Choice 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: Museum of Leafology **NGSS Topic Arrangements: Structure, Function, and Information Processing; Engineering Design** 	How are all plants alike and how are they different?	Over the course of the module, students become scientists and curators, creating a Museum of Leafology. Full of different "rooms," the Museum exhibits fascinating things students learn about plants. Students explore plants through hands-on activities like outdoor nature explorations and growing their own seedlings. They investigate different parts of plants, and design and build an invention inspired by plants to solve school problems. At the module's close, students invite their friends and family to visit the Museum. Finally, the class prepares a celebratory (and delicious!) salad made of different parts of a plant.	**1-LS1-1** Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.* **1-LS3-1** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. **K–2-ETS1-1** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool. **K–2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem. **K–2-ETS1-3** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	**Crosscutting Concepts** **CCC-1** Patterns **CCC-2** Cause and Effect **CCC-3** Scale, Proportion, and Quantity **CCC-4** Systems and System Models **CCC-6** Structure and Function **CCC-7** Stability and Change **Disciplinary Core Ideas** **LS1.A** Structure and Function **LS1.B** Growth and Development of Organisms **LS1.D** Information Processing **LS3.A** Inheritance of Traits **LS3.B** Variation of Traits **Engineering, Technology, and Applications of Science** **ETS1.A** Defining and Delimiting Engineering Problems	**Engineering, Technology, and Applications of Science (continued)** **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 Math 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 III** Natural systems change in ways that people benefit from and can influence	**Common Core English Language Arts** **L.1.4–5** Vocabulary Acquisition and Use **RI.1.1–3** Key Ideas and Details **RI.1.5–6** Craft and Structure **RI.1.7** Integration of Knowledge and Ideas **SL.1.1–3** Comprehension and Collaboration **SL.1.4–6** Presentation of Knowledge and Ideas **W.1.7–8** 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** **1.MD.A** Measure lengths indirectly and by iterating length units **1.MD.C** Represent and interpret data **MP7** Look for and make use of structure
2: Animal Reporters **NGSS Topic Arrangements: Waves; Structure, Function, and Information Processing; Engineering Design** 	How do animals use their body parts, communicate with their young, and make sounds?	Students grab their notepads and take on the role of Animal Reporters, embarking on a global quest to observe different animals. On their journey they discover how animals use their body parts and how young animals are similar to and different from their parents. Students learn about sound, finding out how animals communicate with each other. Finally, they are challenged to design and build their own communication devices, discovering how they too can use sounds to communicate over long distances. Over the course of the module, these intrepid Animal Reporters record and present their findings in preparation for their final written articles.	**1-LS1-2** Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. **1-LS3-1** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. **1-PS4-1** Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. **1-PS4-4** Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.* **K–2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.	**Crosscutting Concepts** **CCC-1** Patterns **CCC-2** Cause and Effect **CCC-3** Scale, Proportion, and Quantity **CCC-4** Systems and System Models **CCC-6** Structure and Function **Disciplinary Core Ideas** **LS1.A** Structure and Function **LS1.B** Growth and Development of Organisms **LS1.D** Information Processing **LS3.A** Inheritance of Traits **LS3.B** Variation of Traits **PS4.A** Wave Properties **PS4.C** Information Technologies and Instrumentation	**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-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.1.1–3** Key Ideas and Details **RI.1.4–5** Craft and Structure **RI.1.7–8** Integration of Knowledge and Ideas **SL.1.1–3** Comprehension and Collaboration **SL.1.4–5** Presentation of Knowledge and Ideas **W.1.2** Text Types and Purposes **W.1.5** Production and Distribution of Writing **W.1.8** 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** **1.MD.A** Measure lengths indirectly and by iterating length units **1.MD.C** Represent and interpret data **1.NBT.A** Extend the counting sequence **1.NBT.B** Understand place value **MP2** Reason abstractly and quantitatively **MP5** Use appropriate tools strategically **MP7** Look for and make use of structure
3: Shadow Town **NGSS Topic Arrangements: Waves** 	Why is the town of Rjukan in a shadow?	Let's go to Shadow Town! The town of Rjukan, in Norway, spends half the year with no direct sunlight. But why? Over the course of the module, students explore light, shadows, and reflection. They create shadow puppets to tell stories of life in Rjukan and experiment with reflective surfaces. Finally, they come up with ideas to solve Rjukan's problem and compare these with the incredible real-life solution—Rjukan's residents built giant mirrors to redirect sunlight into their town square.	**1-PS4-2** Make observations to construct an evidence-based account that objects can be seen only when illuminated. **1-PS4-3** Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light.	**Crosscutting Concepts** **CCC-1** Patterns **CCC-2** Cause and Effect **Disciplinary Core Ideas** **PS4.B** Electromagnetic Radiation	**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	**Common Core English Language Arts** **L.1.5–6** Vocabulary Acquisition and Use **RI.1.1–3** Key Ideas and Details **RI.1.5** Craft and Structure **RI.1.7–9** Integration of Knowledge and Ideas **RL.1.1–3** Key Ideas and Details **RL.1.4** Craft and Structure **RL.1.7** Integration of Knowledge and Ideas **SL.1.1–3** Comprehension and Collaboration **SL.1.4–6** Presentation of Knowledge and Ideas **W.1.3** Text Types and Purposes **W.1.7–8** 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** **1.MD.A** Measure lengths indirectly and by iterating length units **1.MD.C** Represent and interpret data **1.G.A** Reason with shapes and their attributes
4: Patterns in the Sky **NGSS Topic Arrangements: Space Systems** 	What patterns do we observe in the sky?	The sky is full of amazing patterns, formed by a rich tapestry of celestial objects like the Sun and Moon. Can we use these patterns to make predictions? In this module, students become junior astronomers, using naked-eye observations, creating models, and watching videos to observe and collect data on phenomena that affect us every day. They explore the way the Sun and Moon appear to move across the sky and create posters that document all they have learned.	**1-ESS1-1** Use observations of the Sun, Moon, and Stars to describe patterns that can be predicted. **1-ESS1-2** Make observations at different times of year to relate the amount of daylight to the time of year.	**Crosscutting Concepts** **CCC-1** Patterns **CCC-2** Cause and Effect **CCC-3** Scale, Proportion, and Quantity **Disciplinary Core Ideas** **PS4.B** Electromagnetic Radiation **ESS1.A** The Universe and Its Stars **ESS1.B** Earth and the Solar System	**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 III** Natural systems change in ways that people benefit from and can influence	**Common Core English Language Arts** **RF.1.4** Fluency **RI.1.1, 3** Key Ideas and Details **RI.1.4** Craft and Structure **RI.1.7–8** Integration of Knowledge and Ideas **RI.1.10** Range of Reading and Level of Text Complexity **SL.1.1–3** Comprehension and Collaboration **SL1.4–5** Presentation of Knowledge and Ideas **W.1.1–2** Text Types and Purposes **W.1.8** 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** **1.MD.A** Measure lengths indirectly and by iterating length units **1.MD.B** Tell and write time **1.MD.C** Represent and interpret data **1.G.A** Reason with shapes and their attributes