West Essex Consortium Curriculum
Essex Fells, Fairfield, North Caldwell, Roseland
Science Department

I. COURSE NAME: Science

II. GRADE LEVEL(S): K-2

III. COURSE DESCRIPTION: The performance expectations in K-2 help students formulate answers to questions such as: “What happens if you push or pull an object harder?” Students in K are able to apply an understanding of the effects of different strengths or different directions of pushes and pulls on the motion of an object to analyze a design solution. “What happens when materials vibrate?” Students in 1 are expected to develop understanding of the relationship between sound and vibrating materials. “What are different kinds of land and bodies of water?” Students in 2 are able to use information and models to identify and represent the shapes and kinds of land and bodies of water in an area and where water is found on Earth. K-2 performance expectations include PS1, PS2, PS3, PS4, LS1, LS2, LS3, LS4, ESS1, ESS2, ESS3 and ESS4. The crosscutting concepts of patterns; cause and effect; energy and matter; structure and function; stability and change; and influence of engineering, technology, and science on society and the natural world are called out as organizing concepts for these disciplinary core ideas.

IV. COURSE OBJECTIVES: In the K-2 performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

V. TEXTS/RESOURCES

A. **https://www.wastatelaser.org/science-notebooks/**
B. www.NSTA.org
C. www.nextgenscience.org
D. www.njctl.org
E. www.eie.org Engineering is Elementary
F.

VII. EVALUATIONS/ASSESSMENTS

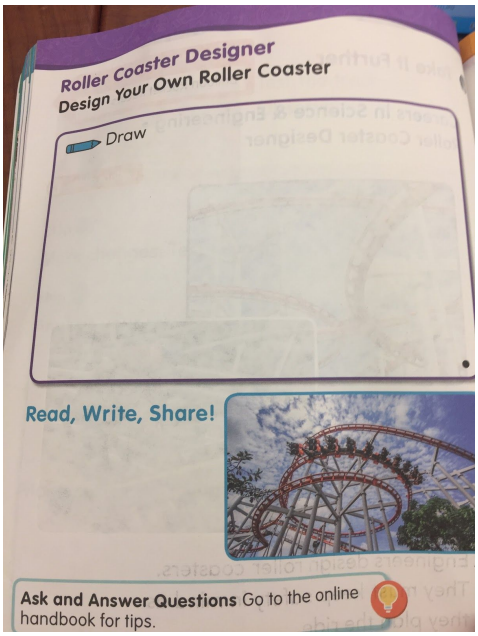
A combination of formative and summative assessments will be utilized in this course including, but not limited to teacher observations, student work and reflections, projects, quizzes and tests, and writing tasks.

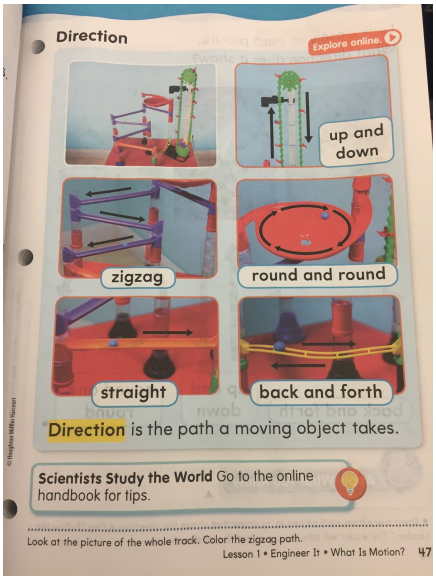
VIII. SCOPE AND SEQUENCE (see table below)

This course has been designed with respect to and in compliance with the expectations set forth in the state-approved standards.

Scope and Sequence of Content and Skills for Science K

Unit Name K1	Motion and Stability: Forces and Interactions
Estimated Timeline	October-May
NGSS	K-PS2-1 K-PS2-2
Student Learning Objectives	● Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object. ● Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull. ● Define push, pull, direction, and change
Suggested projects, activities, labs used to support content, and resources	● Examples of pushes or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other. Push and pull races. Limit assessment to different relative strengths or different directions, but not both at the same time. Mouse Trap game. Design a track (marbles) ● Examples of problems requiring a solution could include having a marble or other object move a certain distance, follow a particular path, and knock down other objects. (Dominoes) ● Examples of solutions could include tools such as a ramp to increase the speed of the object and a structure that would cause an object such as a marble or ball to turn. Design a ramp and comparing heights for speed. ● Design a roller coaster
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● journal entries ● response sheets
Suggested Resources	● http://www.nextgenscience.org/ ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Foss kit: Materials and Motions

	https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent?dDocName=G3932058 ● Scholastic News (w/ online resource) ● Science Spin (w/ online resource) ● The Boy Who Harnessed the Wind by, William Kamkwamba & Brian Mealer ● Forces that Make Things Move by, Kimberly Bradley ● What Makes a Magnet? By, Franklyn M. Branley ● Lesson Plan for Push and Pull Unit http://www.harmonydc.org/Curriculum/pdf/kindersample.pdf ● Forces Unit https://eucaps.wsu.edu/wp-content/uploads/sites/731/2015/04/Kindergarten-Force-Motion-Lessons.pdf  Roller Coaster Designer Design Your Own Roller Coaster Draw Read, Write, Share! Ask and Answer Questions Go to the online handbook for tips.

Unit Name K2	Energy
Estimated Timeline	October-May
NGSS	K-PS3-1 K-PS3-2
Student Learning Objectives	● Make observations to determine the effect of sunlight on Earth's surface. ● Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.
Suggested projects, activities, labs used to support content	● Examples of Earth's surface could include sand, soil, rocks, and water. ● Water experiments- liquid solid gas and how heat affects. Ice in sunlight and ice in shade experiment. ● Sun's heat experiment: Using Rocks on plates put in shade and sunlight. Compare heat and feel. ● Limit assessment of temperature to relative measures such as warmer/cooler ● Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun. ● Design shade for your pet rock.

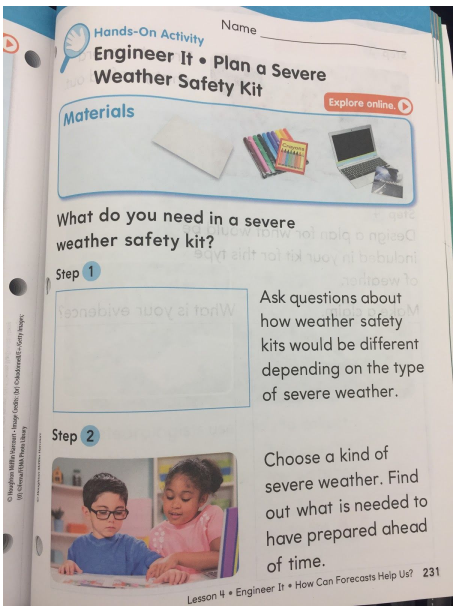
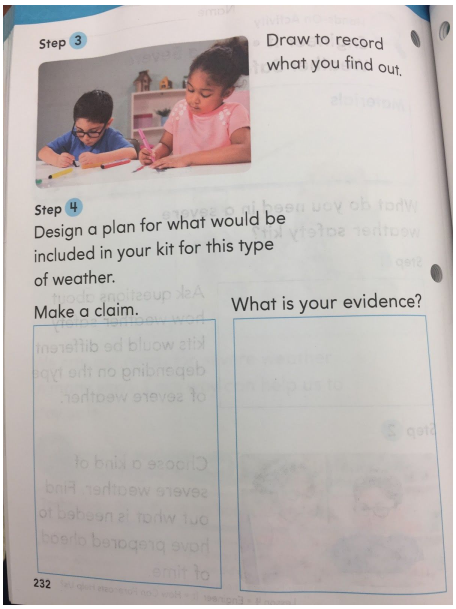
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● Journal entries ● response sheets
Suggested resources	● http://www.nextgenscience.org/ ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Scholastic News (w/ online resource) ● Science Spin (w/ online resource) ● The Boy Who Harnessed the Wind by, William Kamkwamba & Brian Mealer ● Forces that Make Things Move by, Kimberly Bradley ● What is the World Made Of? By, Kathleen Weidner Zoehfeld ● What Makes a Magnet? By, Franklyn M. Branley

Unit Name K3	From Molecules to Organisms: Structures and Processes
Estimated Timeline	October-May
NGSS	K-LS1-1
Student Learning Objectives	● Use observations to describe patterns of what plants and animals (including humans) need to survive.
Suggested projects, activities, labs used to support content	● Examples of patterns could include that animals need to take in food but plants do not ● The different kinds of food needed by different types of animals ● The requirement of plants to have light ● All living things need water Plant Unit ● Planting, observing and comparing plant growth based upon needs ● Comparing needs and wants of different plants (desert etc) Animal Units ● Wants and needs of plants or animals and their environment:

	Chicks, butterflies, Frogs, Penguins, Squirrels (hibernation) ● Habitat Design challenges: Ponds/Desert/Forest/Oceans/Arctic/Farm
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● journal entries ● response sheets
Suggested resources	● http://www.nextgenscience.org/ ● Foss Kits: Animals two by two https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent?dDocName=G3871660 ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Scholastic News (w/ online resource) ● Science Spin (w/ online resource) ● Air is All Around You by, Franklyn M. Branley ● The Boy Who Harnessed the Wind by, William Kamkwamba & Brian Mealer ● Forces that Make Things Move by, Kimberly Bradley ● My Light by Molly Bang ● What is the World Made Of? By, Kathleen Weidner Zoehfeld ● What Makes a Magnet? By, Franklyn M. Branley

Unit Name K4	Earth's Systems
Estimated Timeline	October-May
NGSS	K-ESS2-1 K-ESS2-2
Student Learning Objectives	● Use and share observations of local weather conditions to describe patterns over time.

	• Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.
Suggested projects, activities, labs used to support content	• Qualitative observations could include descriptions of the weather (such as sunny, rainy, and warm) • Quantitative observations could include numbers of sunny, windy, and rainy days in a month. • Patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months. • Limit assessment of quantitative observations to whole numbers and relative measures such as warmer/cooler. • Different types of severe weather: Make or model types of weather noises. Ex: thunder, rain • Design a plan for a severe weather kit: include things for safety and fun • Create a weather forecasting center and create tools for weather prediction • Adapting to environment: Hibernation, storing food for the winter
Suggested assessments	Students can demonstrate competency with tasks such as: • developing and refining models • generating, discussing and analyzing data • constructing spoken and written scientific explanations • engaging in evidence-based argumentation • reflecting on their own understanding • Journal entries • response sheets
Suggested resources	• Foss Kit: Trees and Weather https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent?dDocName=G3932057 • http://www.nextgenscience.org/ • http://www.brainpopjr.com • http://www.learn360.com • Foss online: http://www.fossweb.com • https://www.teachingchannel.org • Scholastic News (w/ online resource) • Science Spin (w/ online resource) • Magic School Bus: Lost in the Solar System

	 Hands-On Activity Name Engineer It • Plan a Severe Weather Safety Kit Explore online. Materials What do you need in a severe weather safety kit? Step 1 Ask questions about how weather safety kits would be different depending on the type of severe weather. Step 2 Choose a kind of severe weather. Find out what is needed to have prepared ahead of time. Lesson 4 • Engineer It • How Can Forecasts Help Us? 231  Step 3 Draw to record what you find out. Step 4 Design a plan for what would be included in your kit for this type of weather. Make a claim. What is your evidence? 232

Unit Name K5	Earth and Human Activity
Estimated Timeline	October-May
NGSS	K-ESS3-1 K-ESS3-2 K-ESS3-3
Student Learning	• Use a model to present the relationship between the needs of

Objectives	different plants or animals (including humans) and the places they live. ● Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. ● Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.
Suggested projects, activities, labs used to support content, and resources	● Relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas ● Grasses need sunlight so they often grow in meadows. ● Plants, animals and their surroundings make up a system. ● Emphasis is on local forms of severe weather. ● Human impact on the land : Recycle reduce reuse ○ Haunted House project ○ Gingerbread house project ○ Leprechaun traps ○  ● Exploring where trash goes : Experiment burying trash and observing ● Natural Resources: 3 little pigs experiment- building houses using straw, popsicle sticks and clay bricks
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● notebook entries ● response sheets
Suggested Resources	● Foss Kits: Trees and Weather https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent?dDocName=G3932057 ● Foss Kits: Animals two by two https://www.fossweb.com/delegate/ssi-wdf-ucm-webContent?dDocName=G3871660 ● http://www.nextgenscience.org/ ● http://www.brainpopjr.com

	• http://www.learn360.com • Foss online: http://www.fossweb.com • https://www.teachingchannel.org • Scholastic News (w/ online resource) • Science Spin (w/ online resource) • Water! Water! Water! By, Nancy Elizabeth Wallace • What is the World Made Of? By, Kathleen Weidner Zoehfeld • What Makes a Magnet? By, Franklyn M. Branley • Magic School Bus Inside the Earth

Unit Name K6	Engineering Design
Estimated Timeline	September- June
NGSS	K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3
Student Learning Objectives	• 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. • 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. • Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.

Suggested projects, activities, labs used to support content	• Launching Unit: Exploring Centers
	  ○ What is an engineering scientist?
	  ○ What are problems/ solutions
	  ○ What are ways to design- sketching/physical model
	  ○ How do we analyze
	• Establish a weekly Engineering Center
	• Students create devices to get “that pesky itch in the center of your back.” Once the idea is thought through students produce design sketches and are given everyday materials and recyclables to create their designs.
	•

Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● journal entries ● response sheets
Suggested resources	● **Kindergarten Launching Unit/Center https://docs.google.com/document/d/1b7YIc5m-evdfHIEBrWoYksecgA77xQqjP0GrJOf8FfA/edit** ● http://www.nextgenscience.org/ ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Scholastic News (w/ online resource) ● Science Spin (w/ online resource) ● Rosie Revere Engineer by, Andrea Beaty ● NGSS Book Source Book List http://www.booksource.com/Products/NGSS-Kindergarten-Complete__NGK-ALL-spc-16.aspx?CategoryBvin=b124d8b2-763d-4fcb-920e-2cbf61800150&SubCategoryBvin=b34aa90f-9a8d-4de8-b82d-41d31a4fbc84&CollectionBvin=bf7031f3-e73b-4b77-81b5-e1aa8110cb7e

Scope and Sequence of Content and Skills for Science Grade 1

1st Grade Launching Unit

NGSS- K-2-ETS1-1, K-2-ETS1-3

- **Day 1: Introduce science. What is science?**
  -Read aloud What is Science? by Rebecca Kai Dotlich
  -Brainpopjr video - Science Skills
  https://jr.brainpop.com/science/beascientist/scienceskills/preview.weml

- **Day 2: Introduce scientists. What do scientists do? (study the world around them)**
  -Read aloud What is a Scientist? by Barbara Lehn
  -Great Scientists Activity
  http://www.teacherspayteachers.com/Product/Freebie-Great-Scientists-861405
  Scientist Anchor Chart - http://www.pinterest.com/pin/356066532791067 29/
  -Draw and label a picture of what a scientist looks like to you.

- **Day 3: What is an engineer? What do engineers do? (problem solvers)**
  -Read aloud Rosie Revere Engineer by Andrea Beaty
  https://www.teacherspayteachers.com/Product/Rosie-Revere-Book-growth-mindset-mini-lesson-3127635
  -What does an engineer look like activity. Display pictures of engineers. Draw and label a picture of an engineer.
  -STEM video - https://www.youtube.com/watch?v=AlPJ48simtE
  gn-Process-900979

- **Day 4: Introduce and set up STEM notebook**
  -Templates for STEM notebooks on shared drive.
  -Create cover, table of contents, page numbers.
  https://www.wastatelaser.org/science-notebooks/

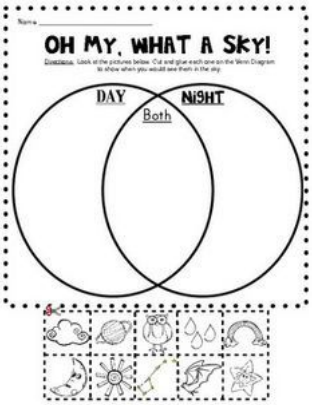
- **Days 5-6: Introduce Engineering Design Process (EDP) for K-2**
  -Introduce Engineering Design Process (Ask, Imagine, Plan, Create, Improve)
  -Introduce Design Challenges - Design a name tag

https://www.teacherspayteachers.com/Product/STEM-Engineering-Starter-Kit-for-Teachers-elementary-level-977781

**Discuss science safety and proper use of science tools/materials throughout units as the lesson permits.

Unit Name 1.4	Engineering Design
Estimated Timeline	September(LAUNCH)-June **INTEGRATE THROUGHOUT THE YEAR https://docs.google.com/document/d/1mbbnduE5qsRYEKMoRz4PO1rbX2tmuGKHXA3Gym1pDeY/edit
NGSS	K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3
Student Learning Objectives	● Create STEAM journal/notebook-explain routine of using the notebook to keep track of observations ● Understand the roles of a scientist and engineer ● 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. ● 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. ● Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
Suggested projects, activities, labs used to support content	● Students can draw diagrams of their planned derby cars and build them based on those drawings. ● Students will design their own investigation based on the question they created about pill bugs. You can encourage students to create a model for a final product based on what they learned throughout their investigation.
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations

	• engaging in evidence-based argumentation • reflecting on their own understanding • Journal entries • response sheets • Self assessment/rubric https://www.spfk12.org/cms/lib/NJ01001501/Centricity/Domain/9/Science%20Rubric.pdf
Suggested resources	• http://www.nextgenscience.org/ • https://betterlesson.com/lesson/resource/3070763/the-engineering-design-process?from=lessonsection_narrative • https://betterlesson.com/home • http://speechisbeautiful.com/2017/03/10-wordless-videos-teach-problem-solving/ • http://www.brainpopjr.com • http://www.learn360.com • Foss online: http://www.fossweb.com • https://www.teachingchannel.org • https://nj.pbslearningmedia.org/resource/75e3c673-b02d-4d7b-a490-8a943c013662/75e3c673-b02d-4d7b-a490-8a943c013662/#.WRnD3-srLcs • Scholastic News (w/ online resource) • Science Spin (w/ online resource) • Rosie Revere, Engineer by, Andrea Beaty • Thomas Edison: Great American Inventor by, Shelley Bedik • The Most Magnificent Thing by Ashley Spires..author website/blog & youtube clip • The Girl Who Never Made Mistakes by Mark Pett • What Do You Do With An Idea? By Kobi Yamada • Those Darn Squirrels! By Adam Rubin

Unit Name 1.3	**<u>EARTH SCIENCE</u>** Space Systems: Patterns and Cycles
Estimated Timeline	October/November/December
NGSS	1-ESS1-1 1-ESS1-2
Student Learning Objectives	● Use observations of the sun, moon, and stars to describe patterns that can be predicted. ● Make observation at different times of year to relate the amount of daylight to the time of the year.
Suggested projects, activities, labs used to support content, and resources	● Examples of patterns could include that the sun and moon appear to rise in one part of the sky, move across the sky and set. ● Oreo Cookie Moon Phases ●  ● Observing the night sky for 2 weeks for homework-draw what the night sky looks like (moon, stars) ● Learn about how the stars other than our sun are visible at night, but not during the day. ● Emphasize relative comparisons of the amount of daylight in the winter to the amount in the spring and fall. ● Make comparisons of the day and night sky. ●  Teacherspayteachers day and night picture sort
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models

	• generating, discussing and analyzing data • constructing spoken and written scientific explanations • engaging in evidence-based argumentation • reflecting on their own understanding • journal entries • response sheets • Self assessment/rubric
Suggested Resources	• http://www.nextgenscience.org/ • https://betterlesson.com/lesson/635856/the-predictable-patterns-of-the-sun-and-the-seasons • https://betterlesson.com/lesson/613470/observing-the-sun • https://betterlesson.com/lesson/613469/introduction-and-pre-assessment • https://betterlesson.com/lesson/633422/let-s-observe-the-sun-day-1 • https://betterlesson.com/home • http://www.brainpopjr.com • http://www.learn360.com • Foss online: http://www.fossweb.com • https://www.teachingchannel.org • Scholastic News (w/ online resource) • Science Spin (w/ online resource) • The Magic School Bus Explores the Solar System • https://mysteryscience.com/sky/sun-moon-stars • The Sun by Seymour Simon • King Kafu and the Moon by, Trish Cooke

Unit Name 1.1	**PHYSICAL SCIENCE** Waves: Light and Sound
Estimated Timeline	January/February
NGSS	1-PS4-1 1-PS4-2 1-PS4-3 1-PS4-4
Student Learning Objectives	• Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.

	• Make observations to construct an evidence-based account that objects can be seen only when illuminated. • Plan and conduct an investigation to determine the effect of placing objects made with different materials in the path of a beam of light. • Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.
Suggested projects, activities, labs used to support content	• Examples of vibrating materials that make sound could include tuning forks and plucking a stretched string. • Examples of how sound can make matter vibrate could include holding a piece of paper near a speaker making sound and holding an object near a vibrating tuning fork. • Examples of observations could include those made in a completely dark room, a pinhole box, and a video of a cave explorer with a flashlight. Illumination could be from an external light source or by an object giving off its own light. • Examples of materials could include those that are transparent (such as clear plastic), translucent (such as wax paper), opaque (such as cardboard), and reflective (such as a mirror). • https://www.teacherspayteachers.com/Product/Science-Unit-on-Light-Aligned-NGSS-with-5-E-Lessons-929948 • Examples of devices could include a light source to send signals, paper cup and string "telephones", and a pattern of drum beats. •
Suggested assessments	Students can demonstrate competency with tasks such as: • developing and refining models • generating, discussing and analyzing data • constructing spoken and written scientific explanations • engaging in evidence-based argumentation • reflecting on their own understanding • notebook entries • response sheets • Self assessment/rubric
Suggested resources	• http://www.nextgenscience.org/ • https://betterlesson.com/home • https://betterlesson.com/lesson/622032/stem-sound-day-1/ • https://betterlesson.com/lesson/resource/3130569/water-and-sound-waves?from=mtp_home_feed_actor_added_resource_name • https://betterlesson.com/lesson/resource/3064186/5-senses-poster?from=mtp_home_feed_crowd_favorited_resource_name • https://betterlesson.com/lesson/resource/3120274/the-listening-

	walk-work-sample?from=mtp_home_feed_actor_added_resource_name ● https://betterlesson.com/lesson/622032/stem-sound-day-1 ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Scholastic News (w/ online resource) ● Science Spin (w/ online resource) ● My Light by Molly Bang ● Owl Moon by Jane Yolen ● What Are Sound Waves by Robin Johnson ● Sounds All Around by Wendy Pfeffer ● https://mysteryscience.com/light/properties-of-light-sound ● **Magic School Bus-In The Haunted Mansion** (sound)

Unit Name 1.2	**LIFE SCIENCE** Plants and Animals: Structure, Function, and Information Processing
Estimated Timeline	March/April/May
NGSS	1-LS1-1 1-LS1-2 1-LS3-1
Student Learning Objectives	● 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. ● Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. ● Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.
Suggested projects, activities, labs used to support content	● Mimicking plant or animal solutions to solve human problems by designing clothing or equipment to protect bicyclists mimicking turtle shells, acorn shells and animal scales. ● Stabilizing structures by mimicking animal tails and roots on plants. ● Keeping out intruders by mimicking thorns on branches and animal quills; and detecting intruders by mimicking eyes and ears. ● Observe and journal the life cycle of a praying mantis
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● notebook entries ● response sheets ● Self assessment/rubric
Suggested resources	● http://www.nextgenscience.org/ ● https://betterlesson.com/home ● https://betterlesson.com/lesson/resource/3114245/6-animal-classes-song?from=mtp_home_feed_crowd_viewed_resource_name ● https://betterlesson.com/lesson/626229/engineering-solutions ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Scholastic News (w/ online resource) ● Science Spin (w/ online resource) ● Baby Animals by, Seymour Simon ● Big Tracks, Little Tracks by, Millicent Selsam ● https://mysteryscience.com/powers/parts-survival-growth ● The Curious Garden by Peter Brown ● My Little Book of Ocean Life by Camilla de la Bedoyere

	• What If You Had Animal Hair? What If You Had Animal Feet? What If You Had Animal Teeth?--Sandra Markle- Scholastic Books • A Bird is a Bird by Lizzy Rockwell • Best Foot Forward by Ingo Arndt • Feathers: Not Just for Flying by Melissa Stewart • Animal Faces by Penelope Arlon and Tory Gordon-Harris • Born in the Wild: Baby Mammals and their Parents by Lita Judge

Scope and Sequence of Content and Skills for Science 2

Unit Name 2.1	Science Launch
Estimated Timeline	September
NGSS	2-PS1-1 2-PS1-2

	K-2-ETS1-1
Student Learning Objectives	• Scientists ask questions, solve problems, make models and investigate. • Scientist draw conclusions, analyze and interpret data. • Scientists use interactive notebooks to organize ideas, share observations and reflect on results. • Scientists follow safety procedures during investigations. • Teacher models investigation and students observe and discuss • Students repeat investigation with teacher guidance (procedures, diagrams, and results) • Teacher models recording, investigation, reflections in notebook and students practice with guided instruction.
Suggested projects, activities, labs used to support content	• Students write, illustrate and present science safety rules on posters. • Students explore science tools placed randomly in buckets and make predictions as to what the tools may be used for.
Suggested assessments	Students can demonstrate competency with tasks such as: • developing and refining models • generating, discussing and analyzing data • constructing spoken and written scientific explanations • engaging in evidence-based argumentation • reflecting on their own understanding • notebook entries • response sheets • Self assessment/ rubric
Suggested resources	• http://www.nextgenscience.org/ • http://www.brainpopjr.com • http://www.learn360.com • Foss online: http://www.fossweb.com • https://www.teachingchannel.org • Steve Spangler Science: Easy Science Experiments, Science Toys ... • https://www.stevespanglerscience.com/ • McGraw Hill Science Text S1-4 • Related video clips: • https://www.youtube.com/watch?v=IRhjGeRP9zM

	● https://www.youtube.com/watch?v=owHF9iLyxic ● McGraw Hill Science Text S5-8 ● Related activities: ● file:///Users/intentz152/Downloads/Classroom_Science_Notebooks_Presentation_revised.ppt ● file:///Users/intentz152/Downloads/Setting%20Up%20Your%20Science%20Notebook%20Teacher%20Guide.pdf ● Notebook video clip: https://www.youtube.com/watch?v=NVdRfuWe4YM ● Interactive Science Notebooks ● Setting Up Your Science Notebook ● "The Science Penguin" ● www.sciencenotebooks.org PPT ● Pencil/ Marker investigation ● "The Beautiful Oops" ● https://betterlesson.com ● What is a Scientist? https://betterlesson.com/lesson/613405/what-is-a-scientist - Creating a Science Journal https://betterlesson.com/lesson/614612/creating-the-science-journal - Safety in Science https://betterlesson.com/lesson/617181/safety-in-science - Conducting Investigations https://betterlesson.com/lesson/614613/conducting-investigations - Systems - https://betterlesson.com/lesson/614614/systems ● Tools not Toys! https://betterlesson.com/lesson/614615/tools-not-toys ● Seeing in Science: The Skill of Observation https://betterlesson.com/lesson/622982/seeing-in-science-the-skill-of-observation ● Classifying in Science: The Skill of Sorting https://betterlesson.com/lesson/626371/classifying-in-science-the-skill-of-sorting ● Predictions: The Skill of Why? https://betterlesson.com/lesson/626372/predictions-the-skill-of-thinking-why ● Inferences: The Skill of Scientific Metacognition

	https://betterlesson.com/lesson/626374/inferences-the-skill-of-scientific-metacognition - Documenting with Drawing: Sketches-Diagrams and Labels https://betterlesson.com/lesson/626375/documenting-with-drawing-sketches-diagrams-and-labels ● What Do You Do With A Problem by Kobi Yamada ● What Do You Do With An Idea by Kobi Yamada ● Stuck by Oliver Jeffers ● Rosie Revere Engineer by Andrea Beaty ● The Most Magnificent Thing by Ashley Spires ● The Curious Garden by Peter Brown ● Those Darn Squirrels by Adam Rubin ● Dot by Peter Reynolds ● Ish by Peter Reynolds

Unit Name 2.2	Earth's Systems: Processes that Shape the Earth
Estimated Timeline	October - November
NGSS	2-ESS1-1 2-ESS2-1 2-ESS2-2 2-ESS2-3
Student Learning Objectives	● Use information from several sources to provide evidence that Earth events can occur quickly or slowly. ● Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land. ● Develop a model to represent the shapes and kinds of land and bodies of water in an area. ● Obtain information to identify where water is found on Earth and that it can be solid or liquid.
Suggested projects, activities, labs used to support content	● Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly. ● Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass and trees to hold back the land. ● Build sand castles and demonstrate how slow/fast the Earth Changes.

	• Read books based on natural disasters and do brain pops.
Suggested assessments	Students can demonstrate competency with tasks such as: • developing and refining models • generating, discussing and analyzing data • constructing spoken and written scientific explanations • engaging in evidence-based argumentation • reflecting on their own understanding • notebook entries • response sheets • Self assessment/rubric
Suggested resources	• http://www.nextgenscience.org/ • http://www.brainpopjr.com • http://www.learn360.com • Foss online: http://www.fossweb.com • https://www.teachingchannel.org • Steve Spangler Science: Easy Science Experiments, Science Toys ... • https://www.stevespanglerscience.com/ • Scholastic News (w/ online resource) • Science Spin (w/ online resource) • National Geographic Readers: Water by Melissa Stewart • http://betterlesson.com • Coastal Erosion https://betterlesson.com/lesson/636745/coastal-erosion • Bill Nye - Erosion Season 5 Episode 14 • Bill Nye- Volcanoes Season 4 Episode 14 • Bill Nye - Earthquakes Season 4 Episode 4 • https://jr.brainpop.com/science/land/fastlandchanges/ • https://jr.brainpop.com/science/land/slowlandchanges/

Unit Name 2.3	Structure and Properties of Matter
Estimated Timeline	December - January
NGSS	2-PS1-1 2-PS1-2 2-PS1-3

	2-PS1-4
Student Learning Objectives	● Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties. ● Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. ● Make observations to construct an evidence based account of how an object made of a small set of pieces can be disassembled and made into a new object. ● Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
Suggested projects, activities, labs used to support content	● Observations could include color, texture, hardness, and flexibility. ● Patterns could include the similar properties that different materials share. ● Examples of properties could include strength, flexibility, hardness, texture, and absorbency. ● Examples of pieces could include blocks, building bricks, or other assorted small objects. ● Examples of reversible changes could include materials such as water, crayons and butter at different temperatures. ● Examples of irreversible changes could include cooking an egg, freezing a plant leaf, and heating paper.
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● notebook entries ● response sheets
Suggested resources	● http://www.nextgenscience.org/ ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Steve Spangler Science: Easy Science Experiments, Science Toys ... ● https://www.stevespanglerscience.com/

	• Scholastic News (w/ online resource) • Science Spin (w/ online resource) • What is the World Made Of? By Kathleen Weidner Zoehfeld • Changing Matter (Science Readers) by Karen Larson • http://betterlesson.com • Bill Nye - Phases of Matter • https://jr.brainpop.com/science/matter/changingstatesofmatter/

Unit Name 2.4	Interdependent Relationships in Ecosystems
Estimated Timeline	February - May
NGSS	2-LS2-1 2-LS2-2 2-LS4-1
Student Learning Objectives	• Plan and conduct an investigation to determine if plants need sunlight and water to grow. • Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. • Make observations of plants and animals to compare the diversity of life in different habitats. • Plant seeds in three different environments and observe which grew faster.
Suggested projects, activities, labs used to support content	• Limit assessment to one variable at a time with sunlight and water. • Emphasis on the diversity of living things in a variety of different habitats (not including specific animal and plant names). • Endangered animal research project: focus on Habitat, animal description, and why they are endangered. • Each classroom represents a different habitat. • Turtles and Beavers research project. (pond) Read Turtle's Race with Beaver. • Incorporate Empowering Writers-Oviparous creatures (research, publish,type, and draw habitat) Expository & Narrative writing • Engineer it- The children will make a plan to build a tool that will pick up and move different seeds. The children will record their plan, design a model, and test their tool. The children will graph how many seeds they were able to move with their tool.

Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● notebook entries ● response sheets
Suggested resources	● http://www.nextgenscience.org/ ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Steve Spangler Science: Easy Science Experiments, Science Toys ... ● https://www.stevespanglerscience.com/ ● Scholastic News (w/ online resource) ● Science Spin (w/ online resource) ● A Fruit is a Suitcase for Seeds by Jean Richards ● Air is All Around You by, Franklyn M. Branley ● Animal Eyes by, Mary Holland ● Antarctica by, Helen Cowcher ● Arctic Ocean by, John F. Prevost ● Army Ants by, Sandra Markle ● Baby Animals by, Seymour Simon ● Big Tracks, Little Tracks by, Millicent Selsam ● Flip, Float, Fly: Seeds on the Move by JoAnn Early Macken and Pam Paparone ● Get the Scoop on Animal Poop by, Dawn Cusick ● Owl Moon by, Jane Yolen ● Snowflake Bentley by, Jacqueline Briggs Martin ● Seeds and Fruits (Plant Parts) by Melanie Waldron ● A Tree for All Seasons by Robin Bernard ● Up in the Garden and Down in the Dirt by Kate Messner ● Water! Water! Water! By Nancy Elizabeth Wallace ● What Animals Eat by Brenda Stones ● http://betterlesson.com ● Bill Nye - Plants Season 3 Episode 3 ● Bill Nye - Life Cycles Season 5 Episode 6

	• Bill Nye - Flowers Season 4 Episode 10 • Bill Nye - Lakes and Ponds Season 5 Episode Episode 10 • Bill Nye - Ocean Exploration Season 5 Episode 9 • Bill Nye - Desert Season 4 Episode 12 • Bill Nye - Wetlands Season 3 Episode 17 • https://jr.brainpop.com/science/habitats/arctichabitats/ • https://jr.brainpop.com/science/habitats/freshwaterhabitats/ • https://jr.brainpop.com/science/habitats/oceanhabitats/ • https://jr.brainpop.com/science/plants/partsofaplant/ • https://jr.brainpop.com/science/plants/plantlifecycle/ • https://jr.brainpop.com/science/habitats/desert/ • https://jr.brainpop.com/science/habitats/rainforests/ • https://jr.brainpop.com/science/plants/plantadaptations/ • https://jr.brainpop.com/science/habitats/forests/

Unit Name 2.5	Engineering Design
Estimated Timeline	June
NGSS	K-2-ETS1-1 K-2-ETS1-2 K-2-ETS1-3
Student Learning Objectives	• 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. • 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. • Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.
Suggested projects, activities, labs used to support content	• Students are asked to design and build a stick that can pollinate plants in the same manner that a bee does. • Use observations and the engineering design process to test a

	variety of materials and decide which would make the best rain-proof roof for a doghouse.
Suggested assessments	Students can demonstrate competency with tasks such as: ● developing and refining models ● generating, discussing and analyzing data ● constructing spoken and written scientific explanations ● engaging in evidence-based argumentation ● reflecting on their own understanding ● notebook entries ● response sheets
Suggested resources	● http://www.nextgenscience.org/ ● http://www.brainpopjr.com ● http://www.learn360.com ● Foss online: http://www.fossweb.com ● https://www.teachingchannel.org ● Steve Spangler Science: Easy Science Experiments, Science Toys ... ● https://www.stevespanglerscience.com/ ● Scholastic News (w/ online resource) ● Science Spin (w/ online resource) ● Rosie Revere, Engineer by, Andrea Beaty ● Thomas Edison: Great American Inventor by, Shelley Bedik