Kindergarten				
K-PS2		**Motion and Stability: Forces and Interactions**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
K-PS2-1 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. K-PS2-2 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.	*With guidance, plan and conduct an investigation in collaboration with peers. *Analyze data from tests of an object or tool to determine f it works as intended.	*Pushes and pulls can have different strengths and directions. *Pushing or pulling on an object can change the speed or direction of its motion and can start or stop it. *When objects touch or collide, they push on one another and can change motion. *A bigger push or pull makes things speed up or slow down more quickly. (secondary) *A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems can have acceptable solutions.	https://www.weareteachers.com/simple-physics-experiments-for-kids-pushing-and-pulling/ http://www.chem.ucsb.edu/scsp/sites/secure.lsit.ucsb.edu.chem.d7_scsp/files/sitefiles/lessons/Kindergarten%20PS2%20Push%20Pull%20Lesson%20Plans.pdf https://s3.wp.wsu.edu/uploads/sites/731/2015/04/Kindergarten-Force-Motion-Lessons.pdf http://www.cpalms.org/Public/PreviewResourceLesson/Preview/46608 https://www.nextgenscience.org/sites/default/files/K%20Topics%20Model%20Bundle%201.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.K.1 With prompting and support, ask and answer questions about key details in a text. W.K.7 Participate in shared research and writing projects SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood.	MP.2 Reason abstractly and quantitatively K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of” or “less of” the attribute, and describe the difference.	9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.	https://www.learningliftoff.com/kindergarten-science-learning-game-push-pull/ BrainPop Jr. https://jr.brainpop.com/science/forces/pushesandpulls/ https://sites.google.com/a/richmond.k12.wi.us/k-5-technology-integration/kindergarten-science https://pbskids.org/fetch/games/coaster/index.html	FOSS Kit: Materials and Motion

Kindergarten				
K-PS3		**Energy**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface. K-PS3-2. Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.	*Make observations (firsthand or from media) to collect data that can be used to make comparisons. *Use tools and materials provided to design and build a device that solves a specific problem or a solution to a specific problem.	*Sunlight warms Earth's surface.	http://www.learnplayimagine.com/2014/05/sun-activities-for-kindergarten.html http://redtri.com/sun-science-experiments/slide/5 https://buggyandbuddy.com/sun-shelter/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (K-PS3-1),(K-PS3-2)	K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference. (K-PS3-1),(KPS3-2)	9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.	https://www.enchantedlearning.com/subjects/astronomy/sun/sun.shtml	FOSS: Trees and Weather Kit

Kindergarten				
K-LS1-1		**From Molecules to Organisms: Structures and Processes**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.	*Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.	*All animals need food in order to live and grow. They obtain their food from plants or from other animals. Plants need water and light to live and grow.	https://betterlesson.com/lesson/640647/what-do-plants-need-part-i https://betterlesson.com/lesson/641203/comparing-needs-of-plants-and-humans https://www.chester-nj.org/cms/lib/NJ02209113/Centricity/Domain/42/K%20-%20Animals%20and%20Plant%20Needs.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them).	K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/”less of” the attribute, and describe the difference.	9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.	https://pbskids.org/caillou/immersivegames/?gameID=5 https://pbskids.org/plumlanding/games/ecosystem/jungle_jeopardy.html https://pbskids.org/wildkratts/games/aardvark-town/	FOSS: Animals Two by Two Kit

Kindergarten				
K-ESS2		**Earth's Systems**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time. K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.	*Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. *Construct an argument with evidence to support a claim.	*Weather is the combination of sunlight, wind, snow or rain, and temperature in a particular region at a particular time. People measure these conditions to describe and record the weather and to notice patterns over time. *Plants and animals can change their environment. *Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things.	https://rampages.us/mitchellkj3/2015/04/22/kindergarten-weather-unit-lesson-plans/ https://www.pinterest.com/valwhit/weather-kindergarten/?lp=true	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.K.1 With prompting and support, ask and answer questions about key details in a text. W.K.1 Use a combination of drawing, dictating, and writing to compose opinion pieces in which they tell a reader the topic or the name of the book they are writing about and state an opinion or preference about the topic or book. W.K.2 Use a combination of drawing, dictating, and writing to compose informative/ explanatory texts in which they name what they are writing about and supply some information about the topic.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. K.CC.A Know number names and the count sequence. K.MD.A.1 Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object. K.MD.B.3 Classify objects into given categories; count the number of objects in each category and sort the categories by count.	9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.	https://pbskids.org/sid/fablab_weathersurprise.html https://pbskids.org/sesame/games/seasons-spinner/	FOSS: Trees and Weather Kit

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them)				

Kindergarten				
K-ESS3		**Earth and Human Activity**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather. K-ESS3-3. Communicate solutions that will reduce the impact of climate change and humans on the land, water, air, and/or other living things in the local environment.	*Ask questions based on observations to find more information about the designed world. *Use a model to represent relationships in the natural world. *Read grade-appropriate texts and/or use media to obtain scientific information to describe patterns in the natural world. *Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.	*Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. *Some kinds of severe weather are more likely than others in a given region. Weather scientists forecast severe weather so that the communities can prepare for and respond to these events. *Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things. *Asking questions, making observations, and gathering information are helpful in thinking about problems. Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.	https://www.chester-nj.org/cms/lib/NJ02209113/Centricity/Domain/42/K%20-%20Animals%20and%20Plant%20Needs.pdf https://betterlesson.com/lesson/636813/severe-weather-hurricanes-tropical-storms-run-amok?from=cc_lesson https://betterlesson.com/browse/common_core/standard/2063/ngss-k-ess3-2-ask-questions-to-obtain-information-about-the-purpose-of-weather-forecasting-to-prepare-for-and-respond-to-severe	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
RI.K.1 With prompting and support, ask and answer questions about key details in a text. W.K.2 Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic. SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood. SL.K.5 Add drawings or other visual displays to descriptions as desired to provide additional detail.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. K.CC Counting and Cardinality	9.2.4.A.2 Identify various life roles and civic and work-related activities in the school, home, and community.	https://pbskids.org/sid/fablab_weathersurprise.html https://pbskids.org/sesame/games/seasons-spinner/ https://pbskids.org/caillou/immersivegames/?gameID=5 https://pbskids.org/plumlanding/games/ecosystem/jungle_jeopardy.html https://pbskids.org/wildkratts/games/aardvark-town/	FOSS: Animals two by Two Kit FOSS: Trees and Weather Kit

Kindergarten				
K-2-ETS1		**Engineering Design**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change (e.g., climate 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.	*Ask questions based on observations to find more information about the natural and/or designed world(s). *Define a simple problem that can be solved through the development of a new or improved object or tool. *Develop a simple model based on evidence to represent a proposed object or tool. *Analyze data from tests of an object or tool to determine if it works as intended.	*A situation that people want to change or create can be approached as a problem to be solved through engineering. *Asking questions, making observations, and gathering information are helpful in thinking about problems. *Before beginning to design a solution, it is important to clearly understand the problem. *Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. * Because there is always more than one possible solution to a problem, it is useful to compare and test designs.	https://fun-a-day.com/14-fun-engineering-activities-for-kids/ https://thekindergartenconnection.com/awesome-engineering-activities-kids/ https://thestemlaboratory.com/kindergarten-stem-activities/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. W.2.8 Recall information from experiences or gather information from provided	MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3) MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3) MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3) 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set	9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	https://pbskids.org/games/engineering/	

sources to answer a question. SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.				

Grade 1				
1-PS4		**Waves and Their Applications in Technologies for Information Transfers**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
1-PS4-1 Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate. 1-PS4-2 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. 1-PS4-4 Use tools and materials to design and build a device that uses light or sound to solve	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ● Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question. (1-PS4-1),(1-PS4-3) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of	PS4.A: **Wave Properties** ● Sound can make matter vibrate, and vibrating matter can make sound. (1-PS4-1) PS4.B: **Electromagnetic Radiation** ● Objects can be seen if light is available to illuminate them or if they give off their own light. (1-PS4-2) ● Some materials allow light to pass through them, others allow only some light through and others block all the light and create a dark shadow on any surface beyond them, where the light cannot reach. Mirrors can be used	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/ccs/science/resources/QRk2.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	3-D Formative Assessment Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram https://ngss-assessment.portal.concord.org/ngsa-collections

the problem of communicating over a distance.	evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ● Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1- PS4-2) ● Use tools and materials provided to design a device that solves a specific problem. (1-PS4-4)	to redirect a light beam. (Boundary: The idea that light travels from place to place is developed through experiences with light sources, mirrors, and shadows, but no attempt is made to discuss the speed of light.) (1- PS4-3) **PS4.C: Information Technologies and Instrumentation** ● People also use a variety of devices to communicate (send and receive information) over long distances. (1-PS4-4)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
W.1.2 Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure. (1-PS4-2) W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). (1-PS4-1), (1-PS4-2), (1-PS4-3), (1-PS4-4)	MP.5 Use appropriate tools strategically. (1-PS4-4) 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-PS4-4) 1.MD.A.2 Express the length of an object as a whole number of length units, by layering multiple copies of a shorter object (the length unit) end to end; understand that the length measurement of an object is the number of same-size units that span it with no gaps or overlaps. (1-PS4-4).	**Cause and Effect** Simple tests can be designed to gather evidence to support or refute student ideas about causes. (1-PS4-1),(1-PS4-2),(1-PS4-3)	**Influence of Engineering, Technology, and Science, on Society and the Natural World** ● People depend on various technologies in their lives; human life would be very different without technology. (1-PS4-4)	McGraw-Hill Inspire Science FOSS Kits

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-PS4-1), (1-PS4-2), (1- PS4-3) SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups. (1-PS4-1),(1-PS4-2),(1-PS4-3)			Instructional Videos Textbook Online Components	

Grade 1				
1-LS1-1		**From Molecules to Organisms: Structures and Processes**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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.	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions.	**LS1.A: Structure and Function** All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different	https://www.nj.gov/education/aps/cccs/science/resources.htm	3-D Formative Assessment Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion

1-LS1-2. Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.	• Use materials to design a device that solves a specific problem or a solution to a specific problem. (1-LS1-1) **Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in K– 2 builds on prior experiences and uses observations and texts to communicate new information. • Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world. (1-LS1-2)	parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1) **LS1.B: Growth and Development of Organisms** Adult plants and animals can have young. In many kinds of animals, parents and the offspring themselves engage in behaviors that help the offspring to survive. (1-LS1-2) **LS1.D: Information Processing** Animals have body parts that capture and convey different kinds of information needed for growth and survival. Animals respond to these inputs with behaviors that help them survive. Plants also respond to some external inputs. (1-LS1-1)		Venn diagram https://ngss-assessment.portal.concord.org/ngsa-collections
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**

RI.1.1 Ask and answer questions about key details in a text. (1-LS1-2) RI.1.2 Identify the main topic and retell key details of a text. (1-LS1-2) RI.1.10 With prompting and support, read informational texts appropriately complex for grade. (1-LS1-2) W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). (1-LS1-1)	1.NBT.B.3 Compare two two-digit numbers based on the meanings of the tens and one digits, recording the results of comparisons with the symbols >, =, and <. (1-LS1-2) 1.NBT.C.4 Add within 100, including adding a two-digit number and a one-digit number, and adding a two-digit number and a multiple of 10, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning uses. Understand that in adding two-digit numbers, one adds tens and tens, ones and ones; and sometimes it is necessary to compose a ten. (1- LS1-2) 1.NBT.C.5 Given a two-digit number, mentally find 10 more or 10 less than the number, without having to count; explain the reasoning used. (1-LS1-2) 1.NBT.C.6 Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 (positive or zero differences), using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used. (1-LS1-2)	**Patterns** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS1-2) **Structure and Function** The shape and stability of structures of natural and designed objects are related to their function(s). (1-LS1-1)	**Influence of Engineering, Technology, and Science on Society and the Natural World** Every human-made product is designed by applying some knowledge of the natural world and is built using materials derived from the natural world. (1-LS1-1) Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science FOSS Kits

Grade 1				
1-LS3		**Heredity: Inheritance and Variation of Traits**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in K–2 builds on prior experiences and progresses to the use of evidence and ideas in constructing evidence-based accounts of natural phenomena and designing solutions. ● Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (1-LS3-1)	**LS3.A: Inheritance of Traits** Young animals are very much, but not exactly like, their parents. Plants also are very much, but not exactly, like their parents. (1-LS3-1) **LS3.B: Variation of Traits** Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways. (1-LS3-1)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QRk2.pdf	3-D Formative Assessment Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram https://ngss-assessment.portal.concord.org/ngsa-collections
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.1.1 Ask and answer questions about key details in a text. (1-LS3-1) W.1.7 Participate in shared research and writing projects (e.g., explore a number of “how-to” books on a given topic and use them to write a sequence of instructions). (1-LS3-1)	MP.2 Reason abstractly and quantitatively. (1-LS3-1) MP.5 Use appropriate tools strategically. (1-LS3-1) 1.MD.A.1 Order three objects by length; compare the lengths of two objects indirectly by using a third object. (1-LS3-1)	**Patterns** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-LS3-1)	Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science FOSS Kits

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-LS3-1)				

Grade 1				
1-ESS1		**Earth's Place in the Universe**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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	**Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in K–2 builds on prior experiences and progresses to simple investigations, based on fair tests, which provide data to support explanations or design solutions. ● Make observations (firsthand or from media) to collect data that can be used to make comparisons. (1-ESS1-2) **Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations.	**ESS1.A: The Universe and its Stars** Patterns of the motion of the sun, moon, and stars in the sky can be observed, described, and predicted. (1-ESS1-1) **ESS1.B: Earth and the Solar System** Seasonal patterns of sunrise and sunset can be observed, described, and predicted. (1-ESS1-2)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QRk2.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram https://www.nj.gov/education/modelcurriculum/sci/

	● Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (1-ESS1-1)			
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
W.1.7 Participate in shared research and writing projects (e.g., explore a number of "how-to" books on a given topic and use them to write a sequence of instructions). (1-ESS1-1), (1-ESS1-2) W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question. (1-ESS1-1), (1-ESS1-2)	MP.2 Reason abstractly and quantitatively. (1-ESS1-2) MP.4 Model with mathematics. (1-ESS1-2) MP.5 Use appropriate tools strategically. (1-ESS1-2) 1.OA.A.1 Use addition and subtraction within 20 to solve word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using objects, drawings, and equations to represent the problem. (1-ESS1-2) 1.MD.C.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or	**Patterns** Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (1-ESS1-1), (1- ESS1-2)	**Scientific Knowledge Assumes an Order and Consistency in Natural Systems** Science assumes natural events happen today as they happened in the past. (1- ESS1-1) ● Many events are repeated. (1-ESS1-1) Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science

	less are in one category than in another. (1-ESS1-2)			

Grade 1				
K-2-ETS1		**Engineering Design**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change (e.g., climate 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.	**Asking Questions and Defining Problems** Asking questions and defining problems in K–2 builds on prior experiences and progresses to simple descriptive questions. ● Ask questions based on observations to find more information about the natural and/or designed world(s). (K2-ETS1-1) ● Define a simple problem that can be solved through the development of a new or improved object or tool. (K-2- ETS1-1) **Developing and Using Models** Modeling in K–2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. ● Develop a simple model based on evidence to represent a proposed	**ETS1.A: Defining and Delimiting Engineering Problems** ● A situation that people want to change or create can be approached as a problem to be solved through engineering. (K-2-ETS1-1) ● Asking questions, making observations, and gathering information are helpful in thinking about problems. (K-2-ETS1-1) ● Before beginning to design a solution, it is important to clearly understand the problem. (K-2-ETS1-1) **ETS1.B: Developing Possible Solutions** ● Designs can be conveyed through sketches,	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QRk2.pdf	3-D Formative Assessment Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram https://ngss-assessment.portal.concord.org/ngsa-collections https://www.nj.gov/education/modelcurriculum/sci/

	object or tool. (K-2-ETS1-2) **Analyzing and Interpreting Data** Analyzing data in K–2 builds on prior experiences and progresses to collecting, recording, and sharing observations. ● Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)	drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. (K-2-ETS1-2) **ETS1.C: Optimizing the Design Solution** ● Because there is always more than one possible solution to a problem, it is useful to compare and test designs. (K-2-ETS1-3)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**

RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. (K-2-ETS1-1) W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. (K-2-ETS1-1), (K-2-ETS1-3) W.2.8 Recall information from experiences or gather information from provided sources to answer a question. (K-2-ETS1-1), (K-2-ETS1-3) SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings. (K-2-ETS1-2)	MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1), (K-2-ETS1-3) MP.4 Model with mathematics. (K-2-ETS1-1), (K-2-ETS1-3) MP.5 Use appropriate tools strategically. (K-2-ETS1-1), (K-2-ETS1-3) 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. (K-2-ETS1-1), (K-2-ETS1-3)	**Structure and Function** The shape and stability of structures of natural and designed objects are related to their function(s). (K-2-ETS1-2)	Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science FOSS Kits

Second Grade				
2-PS1		**Matter and Its Interactions**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**

2-PS1-1. Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties 2-PS1-2. Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose. 2-PS1-3. 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. 2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.	*Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. *Analyze data from tests of an object or tool to determine if it works as intended. * Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. *Construct an argument with evidence to support a claim.	*Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties. * Different properties are suited to different purposes. *A great variety of objects can be built up from a small set of pieces. * PS1.B: Chemical Reactions Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.	http://www.mccracken.kyschools.us/Downloads/2%20NGSS%20UNIT%20Matter.pdf https://betterlesson.com/community/directory/second_grade/matter_and_its_properties	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. RI.2.8 Describe how reasons support specific points the author makes in a text. W.2.1 Write opinion pieces in which they introduce the topic or book they are writing about, state an opinion, supply reasons	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.	9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.	https://www.youtube.com/watch?v=qYzjg5nRMOg https://www.turtlediary.com/games/second-grade/matter.html http://www.abcya.com/states_of_matter.htm https://www.learninggamesforkids.com/changes-in-matter-games.html	McGraw-Hill Inspire Science FOSS Kits

that support the opinion, use linking words (e.g., because, and, also) to connect opinion and reasons, and provide a concluding statement or section. W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). W.2.8 Recall information from experiences or gather information from provided sources to answer a question.				

Second Grade				
2-LS2		**Ecosystems: Interactions, Energy, and Dynamics**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow. 2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	*Develop a simple model based on evidence to represent a proposed object or tool. *Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question.	*Plants depend on water and light to grow. *Plants depend on animals for pollination or to move their seeds around. *Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people.	https://betterlesson.com/browse/common_core/standard/2091/ngss-2-ls2-1-plan-and-conduct-an-investigation-to-determine-if-plants-need-sunlight-and-water-to-grow https://www.pinterest.com/nationalplt/plant-science-experiments/?lp=true	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). W.2.8 Recall information from experiences or gather information from provided sources to answer a question. SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems.	9.2.4.A.1 Identify reasons why people work, different types of work, and how work can help a person achieve personal and professional goals.	http://interactivesites.weebly.com/plants.html https://www.turtlediary.com/game/stages-of-plant-life-cyle.html	McGraw-Hill Inspire Science FOSS Kits

Second Grade				
2-LS4		Biological Evolution: Unity and Diversity		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.	*Make observations (firsthand or from media) to collect data that can be used to make comparisons.	*There are many different kinds of living things in any area, and they exist in different places on land and in water.	https://betterlesson.com/browse/common_core/standard/2094/ngss-2-ls4-1-make-observations-of-plants-and-animals-to-compare-the-diversity-of-life-in-different-habitats https://educators.brainpop.com/lesson-plan/animals-lesson-plan-diversity-life/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations). W.2.8 Recall information from experiences or gather information from provided sources to answer a question.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems	9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.	http://interactivesites.weebly.com/living-things.html https://www.scholastic.com/magicschoolbus/games/habitat/ l	McGraw-Hill Inspire Science FOSS Kits

Second Grade				
2-ESS1		Earth's Place in the Universe		
Learning Standard	Science and Engineering Practices	Disciplinary Core Ideas	Resources	Assessments
2-ESS1-1. Use information from several sources to provide evidence that Earth events can occur quickly or slowly.	*Make observations from several sources to construct an evidence-based account for natural phenomena.	*Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe.	https://betterlesson.com/browse/common_core/standard/2097/ngss-2-ess1-1-use-information-from-several-sources-to-provide-evidence-that-earth-events-can-occur-quickly-or-slowly http://www.covington.kyschools.us/userfiles/15/My%20Files/2nd	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

			%20add%20chg/Unit%202%202rd%20gr%20unit%202%20pg1.pdf?id=5051 https://ngss.nsta.org/DisplayStandard.aspx?view=pe&id=30	
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. W.2.7 Participate in shared research and writing projects (e.g., read a number of books on a single topic to produce a report; record science observations).) W.2.8 Recall information from experiences or gather information from provided sources to answer a question. SL.2.2 Recount or describe key ideas or details from a text read aloud or information presented orally or through other media.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. 2.NBT.A Understand place value.	9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.	https://www.brainpop.com/games/earthquakegame/ http://www.seismo.ethz.ch/en/knowledge/miscellaneous/earthquake-games/ https://scijinks.gov/menu/games/hurricanes-and-storms/	McGraw-Hill Inspire Science FOSS Kits

Second Grade				
2-ESS2		**Earth's Systems**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.* 2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area 2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid	*Develop a model to represent patterns in the natural world. *Compare multiple solutions to a problem. *Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question.	*Wind and water can change the shape of the land. *Maps show where things are located. One can map the shapes and kinds of land and water in any area. *Water is found in the ocean, rivers, lakes, and ponds. Water exists as solid ice and in liquid form. *Because there is always more than one possible solution to a problem, it is useful to compare and test designs.	https://betterlesson.com/browse/common_core/standard/2099/ngss-2-ess2-1-compare-multiple-solutions-designed-to-slow-or-prevent-wind-or-water-from-changing-the-shape-of-the-land https://www.exploringnature.org/db/view/Grade-2-2-ESS2-Earthrsquos-Systems https://betterlesson.com/browse/common_core/standard/2100/ngss-2-ess2-2-develop-a-model-to-represent-the-shapes-and-kinds-of-land-and-bodies-of-water-in-an-area	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.2.3 Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. RI.2.9 Compare and contrast the most important points presented by two texts on the same topic. W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. W.2.8 Recall information from experiences or gather	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. 2.NBT.A.3 Read and write numbers to 1000 using base-ten numerals, number names, and expanded form. 2.MD.B.5 Use addition and subtraction within 100 to solve word problems involving lengths that are given	9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.	https://matchthememory.com/mrpolum http://interactivesites.weebly.com/landforms.html	McGraw-Hill Inspire Science FOSS Kits

information from provided sources to answer a question. SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings				

Second Grade				
K-2-ETS1		**Engineering Design**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
K-2-ETS1-1. Ask questions, make observations, and gather information about a situation people want to change (e.g., climate change) to define a simple problem that can be solved through the development of a new or improved object or tool.	*Ask questions based on observations to find more information about the natural and/or designed world(s). *Define a simple problem that can be solved through the development of a new or improved object or tool. *Develop a simple model based on evidence to represent a proposed object or tool. *Analyze data from tests of an object or tool to determine if it works as intended.	*A situation that people want to change or create can be approached as a problem to be solved through engineering. *Asking questions, making observations, and gathering information are helpful in thinking about problems. *Before beginning to design a solution, it is important to clearly understand the problem. *Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem's solutions to other people. * Because there is always more than one possible solution to a problem, it is useful to compare and test designs.	https://thestemlaboratory.com/stem-activities-for-kids/ https://www.education.com/activity/second-grade/science/ http://detectiveosterhoff.weebly.com/stem-activities-by-grade-level.html	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
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.				

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
RI.2.1 Ask and answer such questions as who, what, where, when, why, and how to demonstrate understanding of key details in a text. W.2.6 With guidance and support from adults, use a variety of digital tools to produce and publish writing, including in collaboration with peers. W.2.8 Recall information from experiences or gather information from provided sources to answer a question. SL.2.5 Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.	MP.2 Reason abstractly and quantitatively. (K-2-ETS1-1),(K-2-ETS1-3) MP.4 Model with mathematics. (K-2-ETS1-1),(K-2-ETS1-3) MP.5 Use appropriate tools strategically. (K-2-ETS1-1),(K-2-ETS1-3) 2.MD.D.10 Draw a picture graph and a bar graph (with single-unit scale) to represent a data set	9.2.4.A.3 Investigate both traditional and nontraditional careers and relate information to personal likes and dislikes.	https://pbskids.org/games/engineering/	McGraw-Hill Inspire Science FOSS Kits

Grade 3				
3-PS2		Motion and Stability: Forces and Interactions		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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 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	**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	**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	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12Progres	3-D Formative Assessment Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

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. 3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.	cause and effect relationships. (3-PS2-3) ● Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4) **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) ● 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)	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) ● 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) **PS2.B: Types of Interactions** ● Objects in contact exert forces on each other. (3-PS2-1) ● 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,	sionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	https://ngss-assessment.portal.concord.org/ngsa-collections

		on their orientation relative to each other. (3-PS2-3),(3-PS2-4)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
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)	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)	**Patterns** Patterns of change can be used to make predictions. (3-PS2-2) **Cause and Effect** Cause and effect relationships are routinely identified. (3-PS2-1) Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3)	**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) Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science

Grade 3				
3-LS1		**From Molecules to Organisms: Structures and Processes**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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.	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)	**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)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
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) 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)	MP.4 Model with mathematics. (3-LS1-1) 3.NBT Number and Operations in Base Ten (3-LS1-1) 3.NF Number and Operations—Fractions (3-LS1-1)	**Patterns** Patterns of change can be used to make predictions. (3-LS1-1)	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science

Grade 3				
3-LS2		**Ecosystems: Interactions, Energy, and Dynamics**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
3-LS2-1. Construct an argument that some animals form groups that help members survive.	**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). ● Construct an argument with evidence, data, and/or a model. (3-LS2-1)	**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 (Note: Moved from K–2). (3-LS2-1)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
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) 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) W.3.1 Write opinion pieces on topics or texts, supporting a	MP.4 Model with mathematics. (3-LS2-1) 3.NBT Number and Operations in Base Ten (3-LS2-1)	**Cause and Effect** Cause and effect relationships are routinely identified and used to explain change. (3-LS2- 1)	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science

point of view with reasons. (3-LS2-1)				

Grade 3				
3-LS3		**Heredity: Inheritance and Variation of Traits**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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. 3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.	**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) **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)	**LS3.A: Inheritance of Traits** ● Many characteristics of organisms are inherited from their parents. (3-LS3-1) ● 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) **LS3.B: Variation of Traits** ● Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1) ● The environment also affects the traits that an organism develops. (3-LS3-2)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
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) 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) 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) W.3.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. (3-LS3-1), (3-LS3-2) 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)	MP.2 Reason abstractly and quantitatively. (3-LS3-1), (3-LS3-2) MP.4 Model with mathematics. (3-LS3-1), (3-LS3-2) 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)	**Patterns** Similarities and differences in patterns can be used to sort and classify natural phenomena. (3-LS3-1) **Cause and Effect** Cause and effect relationships are routinely identified and used to explain change. (3-LS3-2)	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science

Grade 3				
3-LS4		Biological Evolution: Unity and Diversity		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**

3-LS4-1. Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago. 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. 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. 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.	**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) **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 construct an explanation. (3-LS4-2) **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). ● Construct an argument with evidence. (3-LS4-3)	**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. (secondary to 3-LS4-4) **LS4.A: Evidence of Common Ancestry and Diversity** ● Some kinds of plants and animals that once lived on Earth are no longer found anywhere. (Note: moved from K-2) (3-LS4-1) ● Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1) **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) **LS4.C: Adaptation**	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

	● 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)	● For any particular environment, some kinds of organisms survive well, some survive less well, and some cannot survive at all. (3-LS4-3) **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)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**

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-LS4-1),(3-LS4-2),(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-LS4-2), (3-LS4-3), (3LS4-4) 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-LS4-1),(3-LS4-2),(3-LS4-3), (3-LS4-4) W.3.1 Write opinion pieces on topics or texts, supporting a point of view with reasons. (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-LS4-2),(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	MP.2 Reason abstractly and quantitatively. (3-LS4-1),(3-LS4-2), (3-LS4-3), (3-LS4-4) MP.4 Model with mathematics. (3-LS4-1), (3-LS4-2), (3-LS4-3) ,(3-LS4-4) MP.5 Use appropriate tools strategically. (3-LS4-1) 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-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)	**Cause and Effect** Cause and effect relationships are routinely identified and used to explain change. (3-LS4-2),(3-LS4-3) **Scale, Proportion, and Quantity** Observable phenomena exist from very short to very long time periods. (3-LS4-1) **Systems and System Models** A system can be described in terms of its components and their interactions. (3-LS4-4)	**Interdependence of Science, Engineering, and Technology** Knowledge of relevant scientific concepts and research findings is important in engineering. (3-LS4-4) Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science

understandable pace. (3-LS4-2),(3-LS4-3),(3-LS4-4)				

Grade 3				
3-ESS2		**Earth's Systems**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
3-ESS2-1. Represent data in tables and graphical displays to describe typical weather conditions expected during a particular season. 3-ESS2-2. Obtain and combine information to describe climates in different regions of the world.	**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) **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 ot	**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) ● Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**

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.3.8 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)	MP.2 Reason abstractly and quantitatively. (3-ESS2-1), (3-ESS2-2) MP.4 Model with mathematics. (3-ESS2-1),(3-ESS2-2) 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)	**Patterns** Patterns of change can be used to make predictions. (3-ESS2-1),(3-ESS2-2)	Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science

Grade 3

3-ESS3		Earth and Human Activity		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
3-ESS3-1. Make a claim about the merit of a design solution that reduces the impacts of climate change and/or a weather-related hazard.	**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)	**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) (Note: This Disciplinary Core Idea is also addressed by 4-ESS3-2.)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
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)	MP.2 Reason abstractly and quantitatively. (3-ESS3-1) MP.4 Model with mathematics. (3-ESS3-1)	**Cause and Effect** Cause and effect relationships are routinely identified, tested, and used to explain change. (3-ESS3-1)	**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) Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science

Grade 3				
3-5-ETS1		**Engineering Design**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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.	**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. (3-5-ETS1-1) **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	**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. (3-5-ETS1-1) **ETS1.B: Developing Possible Solutions** ● Research on a problem, such as climate change, 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. (3-5-ETS1-2) ● At whatever stage, communicating with peers about proposed solutions is an important part of the	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

	and the number of trials considered. (3-5-ETS1-3) **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. (3-5-ETS1-2)	design process, and shared ideas can lead to improved designs. (3-5-ETS1-2) ● Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3) **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. (3-5-ETS1-3)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (3-5-ETS1-2) RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (3-5- ETS1-2) RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (3-5-ETS1-2) W.5.7 Conduct short research projects that use several sources to build knowledge through	MP.2 Reason abstractly and quantitatively. (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3) MP.4 Model with mathematics. (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3) MP.5 Use appropriate tools strategically. (3-5-ETS1-1), (3-5-ETS1-2),(3-5-ETS1-3) 3-5.OA Operations and Algebraic Thinking (3-5-ETS1-1), (3-5-ETS1-2)	N/A	**Influence of Engineering, Technology, and Science on Society and the Natural World** People's needs and wants change over time, as do their demands for new and improved technologies. (3-5-ETS1-1) Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5-ETS1-2) Instructional Videos Textbook Online Components	McGraw Hill Inspire Science

investigation of different aspects of a topic. (3-5-ETS1-1), (3-5-ETS1-3) W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (3-5-ETS1-1), (3-5-ETS1-3) W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (3-5-ETS1-1), (3-5-ETS1-3)				

Fourth Grade				
4-PS3		**Energy**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object. 4-PS3-2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents. 4-PS3-3 Ask questions and predict outcomes about the changes in energy that occur when objects collide. [4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.*	*Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships. *Make observations to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. *Use evidence (e.g., measurements, observations, patterns) to construct an explanation. * Apply scientific ideas to solve design problems.	*The faster a given object is moving, the more energy it possesses. * Energy can be moved from place to place by moving objects or through sound, light, or electric currents. *Energy is present whenever there are moving objects, sound, light, or heat. When objects collide, energy can be transferred from one object to another, thereby changing their motion. In such collisions, some energy is typically also transferred to the surrounding air; as a result, the air gets heated and sound is produced.	https://www.opened.com/search?descriptive=energy&grade=4&standard_group=next-generation-science-standards https://ngss.nsta.org/classroom-resources-results.aspx?CoreIdea=3 https://www.resa.net/curriculum/curriculum/science/professionaldevelopment/ngss-pd/lesson-plans-exploring-ngss/ https://www.explorelearning.com/index.cfm?method=cResource.dspStandardCorrelation&id=1889	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

		*Light also transfers energy from place to place. *Energy can also be transferred from place to place by electric currents, which can then be used locally to produce motion, sound, heat, or light. The currents may have been produced to begin with by transforming the energy of motion into electrical energy. *When objects collide, the contact forces transfer energy so as to change the objects' motions. *The expression "produce energy" typically refers to the conversion of stored energy into a desired form for practical use. *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.	http://www.mccracken.kyschools.us/Downloads/4%20NGSS%20UNIT%20Energy%20Waves.pdf https://betterlesson.com/browse/next_gen_science/standard/2135/ngss-4-ps-physical-sciences?from=content_area_science	

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. RI.4.3 Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text. RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. W.4.2 Write informative/explanatory texts to examine a topic and convey ideas and information clearly. W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.	4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings. 9.1.4.F.1 Demonstrate an understanding of individual financial obligations and community financial obligations.	https://energy.techno-science.ca/en/energy-games.php https://climatekids.nasa.gov/menu/energy/ http://interactivesites.weebly.com/electricity-and-energy.html	McGraw Hill Inspire Science Brain Pop Instructional Videos

Fourth Grade				
4-PS4		**Waves and Their Applications in Technologies for Information Transfer**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
4-PS4-1. Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move. 4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen. 4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.*	*Develop a model using an analogy, example, or abstract representation to describe a scientific principle. *Develop a model to describe phenomena. *Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution.	*Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. *Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). *An object can be seen when light reflected from its surface enters the eyes. *Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa. *Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.	https://betterlesson.com/lesson/628342/what-are-waves https://learning-in-action.williams.edu/local-education-outreach/teaching-resources/4th-grade-waves-unit/ https://study.com/academy/topic/4th-grade-science-waves-sound.html https://missbupp2016-2017.weebly.com/waves-unit.html https://www.whatihavelearnedteaching.com/making-waves-sound-wave-properties-fourth-grade-science-stations/ http://ambitiousscienceteaching.org/wp-content/uploads/2014/09/4-Sound-Unit-All-in-One.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes	MP.4 Model with mathematics. 4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.	https://www.flocabulary.com/unit/wave-properties/ https://www.brainpop.com/games/wavecombinator/ https://www.brainpop.com/games/waveonastring/ https://www.legendsoflearning.com/learning-objectives/waves-and-their-properties/	McGraw Hill Inspire Science Brain Pop Instructional Videos

Fourth Grade				
4-LS1		From Molecules to Organisms: Structures and Processes		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.	*Use a model to test interactions concerning the functioning of a natural system. *Construct an argument with evidence, data, and/or a model.	*Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. * Different sense receptors are specialized for particular kinds of information, which may be then processed by the animal's brain. Animals are able to use their percep	https://betterlesson.com/browse/next_gen_science/standard/2147/ngss-4-ls1-1-construct-an-argument-that-plants-and-animals-have-internal-and-external-structures-that-function-to-support-surviv https://www.opened.com/search?standard=4.LS1.1 http://www.covington.kyschools.us/userfiles/15/My%20Files/4th%20gr%20add%20chg/gr%204%20Unit%20%20Structure%20Function%20and%20Information%20Processing.pdf?id=5022	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

			http://www.covington.kyschools.us/userfiles/15/My%20Files/4th%20gr%20add%20chg/gr%204%20Unit%20%20Structure%20Function%20and%20Information%20Processing.pdf?id=5022	
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
W.4.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. SL.4.5 Add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes	4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded across the line into matching parts. Identify line symmetric figures and draw lines of symmetry.		https://pbs39.pbslearningmedia.org/resource/1050daca-32b7-4b5b-b4df-9d0825e0ffd6/life-science-for-grade-4-with-wild-kratts/ https://www.explorelearning.com/index.cfm?method=cResource.dspStandardCorrelation&id=1889 http://www.projectbeak.org/adaptations/build.htm	McGraw Hill Inspire Science Brain Pop Instructional Videos

Fourth Grade				
4-ESS1		**Earth's Place in the Universe**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.	*Identify the evidence that supports particular points in an explanation	*Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed.	https://www.earthsciweek.org/classroom-activities/ngss https://www.pinterest.com/jennvt67/sciencefossils-patterns-in-rock-formations-ngss-4-/?lp=true https://mysteryscience.com/rocks/rock-cycle-earth-s-processes	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table.	9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.	https://www.uen.org/3-6interactives/science.shtml http://studyjams.scholastic.com/studyjams/jams/science/rocks-minerals-landforms/weathering-and-erosion.htm BrainPop: rock cycle, types of rocks	McGraw Hill Inspire Science Brain Pop Instructional Videos

Fourth Grade				
4-ESS2		Earth's Systems		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. 4-ESS2-2. Analyze and interpret data from maps to describe patterns of Earth's features.	*Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. * Analyze and interpret data to make sense of phenomena using logical reasoning.	*Rainfall helps to shape the land and affects the types of living things found in a region. Water, ice, wind, living organisms, and gravity break rocks, soils, and sediments into smaller particles and move them around. *The locations of mountain ranges, deep ocean trenches, ocean floor structures, earthquakes, and volcanoes occur in patterns. Most earthquakes and volcanoes occur in bands that are often along the boundaries between continents and oceans. Major mountain chains form inside continents or	http://ngss-k-5-ausd.weebly.com/4-earth-systems-processes-that-shape-the-earth-part-1.html http://www.whitetwpsd.org/wtsd/About%20WTSD/Curriculum%20Maps/Science/Science%20Grade%204.pdf https://www.sciencea-z.com/main/NextGenerationScienceStandards	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

		near their edges. Maps can help locate the different land and water features areas of Earth. *Living things affect the physical characteristics of their regions.		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.4.7 Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears. W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. 4.MD.A.1 Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. 4.MD.A.2 Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.	https://www.legendsoflearning.com/learning-objectives/weathering-and-erosion/ http://interactivesites.weebly.com/erosion-and-weathering.html https://kidsgeo.com/geology-for-kids/weathering/ http://www.softschools.com/matching_games/science/weathering/994/	McGraw Hill Inspire Science Brain Pop Instructional Videos

Fourth Grade				
4-ESS3		**Earth and Human Activity**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. 4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes and climate change on humans.	*Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design solution. * Obtain and combine information from books and other reliable media to explain phenomena.	*Energy and fuels that humans use are derived from natural sources, and their use affects the environment in multiple ways. Some resources are renewable over time, and others are not. *ESS3.B: Natural Hazards A variety of hazards result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions). Humans cannot eliminate the hazards but can take steps to reduce their impacts. *ETS1.B: Designing Solutions to Engineering Problems Testing a solution involves investigating how well it performs under a range of likely conditions.	https://betterlesson.com/browse/next_gen_science/standard/2157/ngss-4-ess3-2-generate-and-compare-multiple-solutions-to-reduce-the-impacts-of-natural-earth-processes-on-humans https://www.exploringnature.org/db/view/Grade-4-4-ESS3-Earth-and-Human-Activity https://www.opened.com/search?grade=4&standard=4.ESS3.1 https://thewonderofscience.com/4ess32/ https://www.pinterest.com/jennvt67/science-impacts-of-earth-processes-on-humans-ngss-/?lp=true	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
RI.4.1 Refer to details and examples in a text when explaining what the text says explicitly and when drawing inferences from the text. RI.4.9 Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably. W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources. W.4.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. 4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings. 9.1.4.E.1 Determine factors that influence consumer decisions related to money. 9.1.4.F.1 Demonstrate an understanding of individual financial obligations and community financial obligations.	https://www.brainpop.com/games/sortifynaturalresources/ https://www.flocabulary.com/unit/natural-resources/ https://jeopardylabs.com/play/natural-resources-jeopardy-review https://www.neok12.com/Energy-Sources.htm	McGraw Hill Inspire Science Brain Pop Instructional Videos

Fourth Grade				
3-5 ETS1		Engineering Design		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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.	*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.	*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	https://www.pinterest.com/teachersareterrific/4th-grade-stem/?lp=true https://thestemlaboratory.com/stem-activities-for-kids/ https://stemplayground.org/4th/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion

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.	*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. *Generate and compare multiple solutions to a problem based on how well they meet the criteria and constraints of the design problem.	the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account. *Research on a problem, such as climate change, 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. * 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. *Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. * Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints.		Venn diagram
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. 3-5.OA Operations and Algebraic Thinking	9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.	https://www.mastersindatascience.org/blog/the-ultimate-stem-guide-for-kids-239-cool-sites-about-science-technology-engineering-and-math/ http://www.4aplus.com/stem-resources-4-students http://stem-works.com/activities	McGraw Hill Inspire Science Brain Pop Instructional Videos

W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.				

Grade 5				
5-PS1		**Matter and It's Interactions**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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.	**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 a model to describe phenomena. (5-PS1-1) **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	**PS1.A: Structure and Properties of Matter** ● Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf https://www.state.nj.us/education/assessment/sla/science/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S) https://ngss-assessment.portal.concord.org/ngsa-collections

5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. ● 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. (5-PS1-4) ● Make observations and measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon. (5-PS1-3) **Using Mathematics and Computational Thinking** Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. ● Measure and graph quantities such as weight to address scientific and engineering questions and problems. (5-PS1-2)	many observations, including the inflation and shape of a balloon and the effects of air on larger particles or objects. (5-PS1-1) ● The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish. (5-PS1-2) . ● Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) (5-PS1-3) **PS1.B: Chemical Reactions** ● When two or more different substances are mixed, a new substance with different properties may be formed. (5-PS1-4) ● No matter what reaction or change in properties occurs, the total weight of the substances does not change. (Boundary: Mass and weight are not distinguished at this grade level.) (5-PS1-2)		

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-PS1- 1) W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (5-PS1-2), (5-PS1-3), (5-PS1-4) W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-PS1-2), (5-PS1-3), (5-PS1-4) W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (5-PS1-2), (5-PS1-3), (5-PS1-4)	MP.2 Reason abstractly and quantitatively. (5-PS1-1), (5-PS1-2), (5-PS1-3) MP.4 Model with mathematics. (5-PS1-1), (5-PS1-2), (5-PS1-3) MP.5 Use appropriate tools strategically. (5-PS1-2), (5-PS1-3) 5.NBT.A.1 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-PS1-1) 5.NF.B.7 Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. (5-PS1-1) 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real-world problems. (5-PS1-2) 5.MD.C.3 Recognize volume as an attribute of solid figures and understand concepts of volume measurement. (5-PS1-1) 5.MD.C.4 Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. (5-PS1-1)	**Cause and Effect** Cause and effect relationships are routinely identified, tested, and used to explain change. (5-PS1-4) **Scale, Proportion, and Quantity** Natural objects exist from the very small to the immensely large. (5-PS1-1) Standard units are used to measure and describe physical quantities such as weight, time, temperature, and volume. (5-PS1- 2),(5-PS1-3)	Instructional Videos Textbook Online Components	McGraw-Hill Inspire Science Brain Pop NJSLA-S Handbook

Grade 5				
5-PS2		**Motion and Stability: Forces and Interactions**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
5-PS2-1. Support an argument that the gravitational force exerted by Earth on objects is directed down.	**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). ● Support an argument with evidence, data, or a model. (5- PS2-1)	**PS2.B: Types of Interactions** The gravitational force of Earth acting on an object near Earth's surface pulls that object toward the planet's center. (5-PS2-1)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/assessment/sla/science/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S)
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-PS2-1) RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-PS2-1) W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-PS2-1)	N/A	**Cause and Effect** Cause and effect relationships are routinely identified and used to explain change. (5-PS2-1)	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science Brain Pop NJSLA-S Handbook

Grade 5				
5-PS3-1		**Energy**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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.	**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. ● Use models to describe phenomena. (5-PS3-1)	**PS3.D: Energy in Chemical Processes and Everyday Life** The energy released [from] food was once energy from the sun that was captured by plants in the chemical process that forms plant matter (from air and water). (5-PS3-1) **LS1.C: Organization for Matter and Energy Flow in Organisms** Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. (secondary to 5-PS3-1)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf https://www.state.nj.us/education/assessment/sla/science/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S)
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-PS3- 1) SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5- PS3-1)	N/A	**Energy and Matter** Energy can be transferred in various ways and between objects. (5-PS3-1)	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science Brain Pop NJSLA-S Handbook

Grade 5				
5-LS1		**From Molecules to Organisms: Structures and Processes**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water	**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). ● Support an argument with evidence, data, or a model. (5-LS1-1)	**LS1.C: Organization for Matter and Energy Flow in Organisms** Plants acquire their material for growth chiefly from air and water. (5-LS1-1)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/assessment/sla/science/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S)
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-LS1-1) RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-LS1-1) W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-LS1-1)	MP.2 Reason abstractly and quantitatively. (5-LS1-1) MP.4 Model with mathematics. (5-LS1-1) MP.5 Use appropriate tools strategically. (5-LS1-1) 5.MD.A.1 Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. (5-LS1-1)	**Energy and Matter** Matter is transported into, out of, and within systems. (5-LS1-1)	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science Brain Pop NJSLA-S Handbook

Grade 5				
5-LS2		**Ecosystems: Interactions, Energy, and Dynamics**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment	Developing and Using Models Modeling in 3–5 builds on K–2 models and progresses to building and revising simple models and using models to represent events and design solutions. ● Develop a model to describe phenomena. (5-LS2-1)	**LS2.A: Interdependent Relationships in Ecosystems** The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as "decomposers." Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage the balance of an ecosystem. (5-LS2-1) **LS2.B: Cycles of Matter and Energy Transfer in Ecosystems** Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S)

		back into the environment. (5-LS2-1)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-LS2- 1) SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5- LS2-1)	MP.2 Reason abstractly and quantitatively. (5-LS2-1) MP.4 Model with mathematics. (5-LS2-1)	**Systems and System Models** A system can be described in terms of its components and their interactions. (5-LS2- 1)	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science Brain Pop NJSLA-S Handbook

Grade 5				
5-ESS1		**Earth's Place in the Universe**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
5-ESS1-1. Support an argument that differences in the apparent brightness of the sun compared to other stars is due to their relative distances from Earth. 5-ESS1-2. Represent data in graphical displays to reveal patterns of daily changes in length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.	**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 graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships. (5-ESS1-2)	**ESS1.A: The Universe and its Stars** The sun is a star that appears larger and brighter than other stars because it is closer. Stars range greatly in their distance from Earth. (5-ESS1-1) **ESS1.B: Earth and the Solar System** The orbits of Earth around the sun and of the moon around Earth, together with the rotation of Earth about an axis between its North and South poles, cause observable patterns. These include day and night; daily changes in the length and direction of shadows; and	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf https://www.state.nj.us/education/assessment/sla/science/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S)

	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). ● Support an argument with evidence, data, or a model. (5- ESS1-1)	different positions of the sun, moon, and stars at different times of the day, month, and year. (5-ESS1-2)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS1-1) RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-ESS1-1) RI.5.8 Explain how an author uses reasons and evidence to support particular points in a text, identifying which reasons and evidence support which point(s). (5-ESS1-1) RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS1-1) W.5.1 Write opinion pieces on topics or texts, supporting a point of view with reasons and information. (5-ESS1-1) SL.5.5 Include multimedia components (e.g., graphics,	MP.2 Reason abstractly and quantitatively. (5-ESS1-1), (5-ESS1-2) MP.4 Model with mathematics. (5-ESS1-1), (5-ESS1-2) 5.NBT.A.2 Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10. (5-ESS1-1) 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS1-2)	**Patterns** Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena. (5-ESS1-2) **Scale, Proportion, and Quantity** Natural objects exist from the very small to the immensely large. (5-ESS1- 1)	**Systems and System Models** A system can be described in terms of its components and their interactions. (5-LS2- 1) Instructional Videos Textbook Online Components	McGraw Hill Inspire Science Brain Pop NJSLA-S Handbook

sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-ESS1-2)				

Grade 5				
5-ESS2		**Earth's System**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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 of saltwater and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.	**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 a model using an example to describe a scientific principle. (5-ESS2-1) **Using Mathematics and Computational Thinking** Mathematical and computational thinking in 3–5 builds on K–2 experiences and progresses to extending quantitative measurements to a variety of physical properties and using computation and mathematics to analyze data and compare alternative design solutions. ● Describe and graph quantities such as area and volume to address scientific questions. (5-ESS2-2)	ESS2.A: Earth Materials and Systems Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather. (5-ESS2-1) ESS2.C: The Roles of Water in Earth's Surface Processes Nearly all of Earth's available water is in the ocean. Most freshwater is in glaciers or underground; only a tiny fraction is in streams, lakes, wetlands, and the atmosphere. (5- ESS2-2)	https://www.state.nj.us/education/assessment/sla/science/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S) https://nces.ed.gov/surveys/pisa/educators.asp

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (5-ESS2-1),(5-ESS2-2) W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-ESS2-2) SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes. (5-ESS2-1),(5-ESS2-2)	MP.2 Reason abstractly and quantitatively. (5-ESS2-1),(5-ESS2-2) MP.4 Model with mathematics. (5-ESS2-1),(5-ESS2-2) 5.G.A.2 Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5-ESS2-1)	**Scale, Proportion, and Quantity** Standard units are used to measure and describe physical quantities such as weight and volume. (5-ESS2-2) **Systems and System Models** A system can be described in terms of its components and their interactions. (5-ESS2-1)	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science Brain Pop NJSLA-S Handbook

Grade 5				
5-ESS3		**Earth and Human Activity**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources, environment and climate change issues.	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/or other reliable media to explain phenomena or solutions to a design problem. (5-ESS3-1)	ESS3.C: Human Impacts on Earth Systems Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf https://www.state.nj.us/education/assessment/sla/science/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S)
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (5-ESS3-1) RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.(5-ESS3-1) RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (5-ESS3-1) W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources;	MP.2 Reason abstractly and quantitatively. (5-ESS3-1) MP.4 Model with mathematics. (5-ESS3-1)	Systems and System Models A system can be described in terms of its components and their interactions. (5-ESS3-1)	Science Addresses Questions About the Natural and Material World. ● Science findings are limited to questions that can be answered with empirical evidence. (5-ESS3-1) Instructional Videos Textbook Online Components	McGraw Hill Inspire Science Brain Pop NJSLA-S Handbook

summarize or paraphrase information in notes and finished work, and provide a list of sources. (5-ESS3-1) W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (5-ESS3-1)				

Grade 5				
3-5-ETS1		**Engineering Design**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
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.	**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. (3-5-ETS1-1) **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	**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. (3-5- ETS1-1) **ETS1.B: Developing Possible Solutions** ● Research on a problem, such as climate change,	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR35.pdf https://www.state.nj.us/education/assessment/sla/science/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Science (NJSLA-S)

	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. (3-5-ETS1-3) **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. (3-5-ETS1-2)	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. (3-5-ETS1-2) ● 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. (3-5-ETS1-2) ● Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3) **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. (3-5-ETS1-3)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text. (3-5-ETS1-2)	MP.2 Reason abstractly and quantitatively. (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3)	**Influence of Engineering, Technology, and Science on Society and the Natural World** ● People's needs and wants change over	Instructional Videos Textbook Online Components	McGraw Hill Inspire Science Brain Pop NJSLA-S Handbook

RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently. (3-5-ETS1-2) RI.5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably. (3-5-ETS1-2) W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. (3-5-ETS1-1), (3-5-ETS1-3) W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources. (3-5-ETS1-1), (3-5-ETS1-3) W.5.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. (3-5-ETS1-1), (3-5-ETS1-3)	MP.4 Model with mathematics. (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3) MP.5 Use appropriate tools strategically. (3-5-ETS1-1), (3-5-ETS1-2), (3-5-ETS1-3) 3-5.OA Operations and Algebraic Thinking (3-5-ETS1-1), (3-5-ETS1-2)	time, as do their demands for new and improved technologies. (3-5-ETS1-1) ● Engineers improve existing technologies or develop new ones to increase their benefits, decrease known risks, and meet societal demands. (3-5-ETS1-2)		

Modifications/Accommodations

ELL	Alternate responses, extended time, teacher modeling, simplified directions, vocabulary banks, manipulatives, nonverbal responses, sentence frames, prompts, partner talk, advance notes
Special Education	Enlarged graph paper, small group instruction, highlighted instructions/keywords and/or computation signs, hands on activities, visual cues, number line, modified assessment, models, use of calculator, enlarged coordinate grid paper
G&T	Enrichment activities, centers, projects, flexible grouping, interest centers, learning log, extension activities, small group

Grade 6, 7, 8				
EARTH AND SPACE SCIENCES				
MS-ESS1		**Earth's Place in the Universe**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-ESS1-1. Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system. MS-ESS1-4. Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.	**Developing and Using Models** Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ● Develop and use a model to describe phenomena. (MS-ESS1-1),(MS-ESS 1-2) **Analyzing and Interpreting Data** Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ● Analyze and interpret data to determine similarities and differences in findings. (MS-ESS1-3) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6– 8 builds on K–5 experiences and progresses to include constructing explanations and	**ESS1.A: The Universe and Its Stars** ● Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (MS-ESS1-1) ● Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (MS-ESS1-2) **ESS1.B: Earth and the Solar System** ● The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them. (MS-ESS1-2), (MSESS1-3) ● This model of the solar system can explain eclipses of the sun and the moon. Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S) https://nces.ed.gov/surveys/pisa/educators.asp https://ngss-assessment.portal.concord.org/ngsa-collections https://www.nationsreportcard.gov/science_2009/ict_tasks.asp

	designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ● Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-ESS1- 4)	around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. (MS-ESS1-1) ● The solar system appears to have formed from a disk of dust and gas, drawn together by gravity. (MS-ESS1-2) **ESS1.C: The History of Planet Earth** ● The geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale. (MS-ESS1-4)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-ESS1-3), (MS-ESS1-4) **RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-ESS1-3) **WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection,	**MP.2** Reason abstractly and quantitatively. (MS-ESS1-3) **MP.4** Model with mathematics. (MS-ESS1-1),(MS-ESS1-2) **6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-ESS1-1), (MS-ESS1-2), (MS-ESS1-3)	**Patterns** Patterns can be used to identify causeand-effect relationships. (MS-ESS1-1) **Scale, Proportion, and Quantity** Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-ESS1-3), (MS-ESS1-4) **Systems and System Models** Models can be used to represent systems and their interactions. (MS-ESS1-2)	**Interdependence of Science, Engineering, and Technology** Engineering advances have led to important discoveries in virtually every field of science and scientific discoveries have led to the development of entire industries and engineered systems. (MSESS1-3)	McGraw-Hill Inspire Science

organization, and analysis of relevant content. (MS-ESS1-4) **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-ESS1-1), (MS-ESS1-2)				

Grades 6, 7, 8				
EARTH AND SPACE SCIENCES				
MS-ESS2		**Earth's Systems**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process. MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales MS-ESS2-3. Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. MS-ESS2-4. Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions	**Developing and Using Models** Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ● Develop and use a model to describe phenomena. (MSESS2-1),(MS-ESS 2-6) ● Develop a model to describe unobservable mechanisms. (MS-ESS2-4) **Planning and Carrying Out Investigations** Planning and carrying out investigations in 6-8 builds on K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions.	**ESS1.C: The History of Planet Earth** ● Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (HS.ESS1.C GBE) (secondary to MS-ESS2-3) **ESS2.A: Earth's Materials and Systems** ● All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. This energy is derived from the sun and Earth's hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth's materials and	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

MS-ESS2-6. Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	• Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions. (MS-ESS2-5) **Analyzing and Interpreting Data** Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. • Analyze and interpret data to provide evidence for phenomena. (MS-ESS2-3) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. • Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that	living organisms. (MS-ESS2-1) • The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (MS-ESS2-2) **ESS2.B: Plate Tectonics and Large-Scale System Interactions** • Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (MS-ESS2-3) **ESS2.C: The Roles of Water in Earth's Surface Processes** • Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (MS-ESS2-4) • The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean		

	describe nature operate today as they did in the past and will continue to do so in the future. (MS-ESS2-2)	temperatures and currents, are major determinants of local weather patterns. (MSESS2-5) ● Global movements of water and its changes in form are propelled by sunlight and gravity. (MS-ESS2-4) ● Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (MS-ESS2-6) ● Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. (MS-ESS2-2) **ESS2.D: Weather and Climate** ● Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. (MS-ESS2-6) ● Because these patterns are so complex, weather can only be		

		predicted probabilistically. (MS-ESS2-5) • The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents. (MS-ESS2-6)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-ESS2-2) ,(MS-ESS2-3), (MS-ESS2-5) **RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-ESS2-3) **RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (MS-ESS2-3), (MS-ESS2-5) **WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-ESS2-2) **WHST.6-8.8** Gather relevant information from multiple print and digital sources, using search	**MP.2** Reason abstractly and quantitatively. (MS-ESS2-2), (MS-ESS2-3), (MS-ESS2-5) **6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (MS-ESS2-5) **6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS2-2), (MS-ESS2-3) **7.EE.B.4** Use variables to represent quantities in a real-world or mathematical	**Patterns** Patterns in rates of change and other numerical relationships can provide information about natural systems. (MS-ESS2-3) **Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MSESS2-5) **Scale Proportion and Quantity** Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-ESS2- 2) **Systems and System Models** Models can be used to represent systems and their interactions—such as inputs, processes and outputs— and energy, matter, and information flows within systems. (MS-ESS2-6) **Energy and Matter** Within a natural or designed system, the transfer of energy drives the motion and/or cycling of matter. (MS-ESS2-4)		McGraw-Hill Inspire Science

terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ESS2-5) **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-ESS2-1), (MS-ESS2-2), (MSESS2-6)	problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS2-2), (MS-ESS2-3)	**Stability and Change** Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and processes at different scales, including the atomic scale. (MS-ESS2-1)		

Grade 5				
EARTH AND SPACE SCIENCES				
MS-ESS3		**Earth and Human Activity**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-ESS3-1. Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	**Asking Questions and Defining Problems** Asking questions and defining problems in grades 6–8 builds on grades K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models. ● Ask questions to identify and clarify evidence of an argument. (MS-ESS3-5) **Analyzing and Interpreting Data** . Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing	**ESS3.A: Natural Resources** ● Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1) **ESS3.B: Natural Hazards**	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused climate change over the past century.	between correlation and causation, and basic statistical techniques of data and error analysis. ● Analyze and interpret data to determine similarities and differences in findings. (MSESS3-2) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ● Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MSESS3-1)	● Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MSESS3-2) **ESS3.C: Human Impacts on Earth Systems** ● Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth's environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3) ● Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3),(MS-ESS 3- 4) **ESS3.D: Global Climate Change** ● Human activities, such as the release of greenhouse gases from burning fossil fuels, are		

		major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-ESS3-1), (MS-ESS3-2),(MS-ESS3-4), (MS-ESS3-5) **RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-ESS3-2) **WHST.6-8.1** Write arguments focused on discipline content. (MS-ESS3-4) **WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey	**MP.2** Reason abstractly and quantitatively. (MS-ESS3-2), (MS-ESS3-5) **6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-ESS3-3), (MS-ESS3- 4) **7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-ESS3-3), (MS-ESS3-4) **6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an	**Patterns** ● Graphs, charts, and images can be used to identify patterns in data. (MS-ESS3-2) **Cause and Effect** ● Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation. (MS-ESS3-3) ● Cause and effect relationships may be used to predict phenomena in natural or designed systems.	**Influence of Science, Engineering, and Technology on Society and the Natural World** ● All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ESS3-1),(MS-ESS3-4) ● The uses of technologies and any limitations on their use are driven by individual	McGraw-Hill Inspire Science

ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-ESS3-1) **WHST.6-8.7** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ESS3-3) **WHST.6-8.8** Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ESS3-3) **WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. (MS-ESS3-1), (MS-ESS3-4)	unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-ESS3-1), (MS-ESS3-2), (MSESS3-3), (MS-ESS3-4), (MS-ESS3-5) **7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-ESS3-1), (MS-ESS3-2), (MS-ESS3-3), (MS-ESS3-4), (MS-ESS3-5)	(MS-ESS3-1), (MS-ESS3-4) **Stability and Change** ● Stability might be disturbed either by sudden events or gradual changes that accumulate over time. (MS-ESS3-5)	or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. (MS-ESS3-2), (MS-ESS3-3)	

Grade 6, 7, 8				
EARTH AND SPACE SCIENCES				
MS-ETS1		**Engineering Design**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account	**Asking Questions and Defining Problems** Asking questions and defining problems in grades 6–8 builds on grades K–5 experiences and	**ETS1.A: Defining and Delimiting Engineering Problems** ● The more precisely a design task's criteria	https://www.state.nj.us/education/modelcurriculum/sci/videos/	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data

relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions. MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	progresses to specifying relationships between variables, and clarifying arguments and models. ● Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1) **Developing and Using Models** Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ● Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. (MS-ETS1-4) **Analyzing and Interpreting Data** Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ● Analyze and interpret data to determine similarities and	and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1) **ETS1.B: Developing Possible Solutions** ● A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (MS-ETS1-4) ● There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3) ● Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3) ● Models of all kinds are important for testing solutions. (MS-ETS1-4) **ETS1.C: Optimizing the Design Solution** ● Although one design may not perform the	https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

	differences in findings. (MS-ETS1-3) **Engaging in Argument from Evidence** Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world. ● Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-ETS1-2)	best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3) ● The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (MSETS1-4)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-ETS1-1), (MS-ETS1-2), (MS-ETS1-3) **RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-ETS1-3) **RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the	**MP.2** Reason abstractly and quantitatively. (MS-ETS1-1), (MS-ETS1-2), (MS-ETS1-3), (MS-ETS1-4) **7.EE.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation		**Influence of Science, Engineering, and Technology on Society and the Natural World** ● All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ETS1-1) ● The uses of technologies and limitations on their use are driven by individual	McGraw-Hill Inspire Science

same topic. (MS-ETS1-2), (MS-ETS1-3) **WHST.6-8.7** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ETS1-2) **WHST.6-8.8** Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ETS1-1) . **WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. (MS-ETS1-2) **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-ETS1-4)	strategies. (MS-ETS1-1), (MS-ETS1-2), (MS-ETS1-3) **7.SP** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. (MS-ETS1-4)		or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. (MS-ETS1-1)	

Grades 6, 7, 8				
Life Sciences				
MS-LS1		**From Molecules to Organisms: Structures and Processes**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. MS-LS1-2. Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. MS-LS1-3. Use arguments supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. MS-LS1-4. Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. MS-LS1-6. Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms	**Developing and Using Models** Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ● Develop and use a model to describe phenomena. (MS-LS1-2) ● Develop a model to describe unobservable mechanisms. (MS-LS1-7) **Planning and Carrying Out Investigations** Planning and carrying out investigations in 6-8 builds on K5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions. ● Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. (MS-LS1-1) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds	**LS1.A: Structure and Function** ● All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). (MS-LS1-1) ● Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell. (MS-LS1-2) ● In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions. (MS-LS1-3) **LS1.B: Growth and Development of Organisms**	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

MS-LS1-7. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism. MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories. ● Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future. (MS-LS1-5), (MS-LS1-6) **Engaging in Argument from Evidence** Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s). ● Use an oral and written argument supported by evidence to support or refute an explanation or a model for a phenomenon. (MS-LS1-3) ● Use an oral and written argument supported by	● Animals engage in characteristic behaviors that increase the odds of reproduction. (MS-LS1-4) Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction. (MS-LS1-4) ● Genetic factors as well as local conditions affect the growth of the adult plant. (MS-LS1-5) **LS1.C: Organization for Matter and Energy Flow in Organisms** ● Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use. (MS-LS1- 6) ● Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to		

	empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-LS1-4) **Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 6-8 builds on K-5 experiences and progresses to evaluating the merit and validity of ideas and methods. ● Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-LS1-8)	release energy. (MS-LS1-7) **LS1.D: Information Processing** ● Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories. (MS-LS1- 8) **PS3.D: Energy in Chemical Processes and Everyday Life** ● The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen. (secondary to MS-LS1-6) ● Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.		

		(secondary to MS-LS1-7)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-LS1-3), (MS-LS1-4), (MS-LS1-5), (MS-LS1-6) **RST.6-8.2** Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (MS-LS1-5), (MS-LS1-6) **RI.6.8** Trace and evaluate the argument and specific claims in a text, distinguishing claims that are supported by reasons and evidence from claims that are not. (MSLS1-3), (MS-LS1-4) **WHST.6-8.1** Write arguments focused on discipline content. (MS-LS1-3), (MS-LS1-4) **WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS1-5), (MS-LS1-6) **WHST.6-8.7** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-LS1-1) **WHST.6-8.8** Gather relevant information from multiple print	**6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS1-1), (MS-LS1-2), (MS-LS1-3), (MS-LS1-6) **6.SP.A.2** Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape. (MSLS1-4), (MS-LS1-5) **6.SP.B.4** Summarize numerical data sets in relation to their context. (MS-LS1-4), (MS-LS1-5)	**Cause and Effect** ● Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS1-8) ● Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS1-4), (MSLS1-5) **Scale, Proportion, and Quantity** ● Phenomena that can be observed at one scale may not be observable at another scale. (MS-LS1-1) **Systems and System Models** ● Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems. (MS-LS1-3) **Energy and Matter** ● Matter is conserved because atoms are conserved in physical and chemical processes. (MS-LS1-7) ● Within a natural system, the transfer of energy drives the	**Interdependence of Science, Engineering, and Technology** Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-LS1- 1)	McGraw-Hill Inspire Science

and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-LS1-8) **WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. (MS-LS1-5), (MS-LS1-6) **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS1-2), (MS-LS1-7)		motion and/or cycling of matter. (MS-LS1- 6) **Structure and Function** ● Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS1-2)		

Grades 6, 7, 8				
Life Sciences				
MS-LS2		**Ecosystems: Interactions, Energy, and Dynamics**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.	**Developing and Using Models** Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ● Develop a model to describe phenomena. (MS-LS2-3) **Analyzing and Interpreting Data**	**LS2.A: Interdependent Relationships in Ecosystems** ● Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors. (MS-LS2-1)	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram

MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.*	Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ● Analyze and interpret data to provide evidence for phenomena. (MS-LS2-1) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ● Construct an explanation that includes qualitative or quantitative relationships between variables that predict phenomena. (MS-LS2-2) **Engaging in Argument from Evidence** Engaging in argument from evidence in 6–8 builds on K– 5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world(s).	● In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction. (MS-LS2- 1) ● Growth of organisms and population increases are limited by access to resources. (MS-LS2-1) ● Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared. (MS-LS2-2)		New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

	● Construct an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-LS2-4) ● Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-LS2- 5)	**LS2.B: Cycle of Matter and Energy Transfer in Ecosystems** ● Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem. (MS-LS2-3) **LS2.C: Ecosystem Dynamics, Functioning, and Resilience** ● Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations. (MS-LS2-4) ● Biodiversity describes the variety of species		

		found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health. (MS-LS2-5) **LS4.D: Biodiversity and Humans** ● Changes in biodiversity can influence humans' resources, such as food, energy, and medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling. (secondary to MS-LS2-5) **ETS1.B: Developing Possible Solutions** ● There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (secondary to MS-LS2-5)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**

RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-LS2-1), (MS-LS2-2), (MS-LS2-4) **RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-LS2-1) **RST.6-8.8** Distinguish among facts, reasoned judgment based on research findings, and speculation in a text. (MS-LS2-5) **RI.8.8** Trace and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient to support the claims. (MS-LS-4), (MS-LS2-5) **WHST.6-8.1** Write arguments to support claims with clear reasons and relevant evidence. (MS-LS2-4) **WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS2-2) **WHST.6-8.9** Draw evidence from literary or informational texts to support analysis, reflection, and research. (MS-LS2-2), (MS-LS2-4) **SL.8.1** Engage effectively in a range of collaborative discussions (one-on-one, in	**MP.4** Model with mathematics. (MS-LS2-5) **6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-LS2-5) **6.EE.C.9** Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. (MS-LS2-3) **6.SP.B.5** Summarize numerical data sets in relation to their context. (MS-LS2-2)	**Patterns** Patterns can be used to identify cause and effect relationships. (MS-LS2-2) **Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-LS2-1) **Energy and Matter** The transfer of energy can be tracked as energy flows through a natural system. (MSLS2-3) **Stability and Change** Small changes in one part of a system might cause large changes in another part. (MSLS2-4), (MS-LS2-5)	**Influence of Science, Engineering, and Technology on Society and the Natural World** The use of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. (MS-LS2-5)	McGraw-Hill Inspire Science

groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly. (MS-LS2-2) **SL.8.4** Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. (MS-LS2-2) **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS2-3)				

Grades 6,7,8				
Life Sciences				
MS-LS3		**Heredity: Inheritance and Variation of Traits**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-LS3-1. Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual	**Developing and Using Models** Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ● Develop and use a model to describe phenomena. (MS-LS3-1),(MS-LS3-2)	**LS1.B: Growth and Development of Organisms** ● Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring. (secondary to MSLS3-2) **LS3.A: Inheritance of Traits** ● Genes are located in the chromosomes of cells, with each chromosome pair containing two	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

reproduction results in offspring with genetic variation.		variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual. Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits. (MS-LS3-1) ● Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited. (MS-LS3-2) **LS3.B: Variation of Traits** ● In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other. (MS-LS3-2) ● In addition to variations that arise from sexual reproduction, genetic		

		information can be altered because of mutations. Though rare, mutations may result in changes to the structure and function of proteins. Some changes are beneficial, others harmful, and some neutral to the organism. (MS-LS3-1)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-LS3-1), (MS-LS3-2) **RST.6-8.4** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics. (MS-LS3-1), (MS-LS3-2) **RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-LS3-1), (MS-LS3-2) **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-LS3-1), (MS-LS3-2)	**MP.4** Model with mathematics. (MS-LS3-2) **6.SP.B.5** Summarize numerical data sets in relation to their context. (MS-LS3-2)	**Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural systems. (MS-LS3- 2) **Structure and Function** Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the shapes, composition, and relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function. (MS-LS3-1)		McGraw-Hill Inspire Science

Grades 6, 7, 8				
Life Sciences				
MS-LS4		**Biological Evolution: Unity and Diversity**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-LS4-1. Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past. MS-LS4-2. Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships. MS-LS4-3. Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. [MS-LS4-4. Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the	**Analyzing and Interpreting Data** Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ● Analyze displays of data to identify linear and nonlinear relationships. (MS-LS4-3) ● Analyze and interpret data to determine similarities and differences in findings. (MS-LS4-1) **Using Mathematics and Computational Thinking** Mathematical and computational thinking in 6–8 builds on K–5 experiences and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments. ● Use mathematical representations to support scientific conclusions and design solutions. (MS-LS4-6)	**LS4.A: Evidence of Common Ancestry and Diversity** ● The collection of fossils and their placement in chronological order (e.g., through the location of the sedimentary layers in which they are found or through radioactive dating) is known as the fossil record. It documents the existence, diversity, extinction, and change of many life forms throughout the history of life on Earth. (MS-LS4-1) ● Anatomical similarities and differences between various organisms living today and between them and organisms in the fossil record, enable the reconstruction of evolutionary history and the inference of lines of evolutionary descent. (MS-LS4-2) ● Comparison of the embryological development of different species also	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

inheritance of desired traits in organisms. MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	**Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ● Apply scientific ideas to construct an explanation for realworld phenomena, examples, or events. (MS-LS4-2) ● Construct an explanation that includes qualitative or quantitative relationships between variables that describe phenomena. (MS-LS4-4) **Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods. ● Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not	reveals similarities that show relationships not evident in the fully-formed anatomy. (MS-LS4-3) **LS4.B: Natural Selection** ● Natural selection leads to the predominance of certain traits in a population, and the suppression of others. (MS-LS4-4) ● In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring. (MS-LS4-5) **LS4.C: Adaptation** ● Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions. Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a		

	supported by evidence. (MS-LS4-5)	population changes. (MS-LS4-6)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions (MS-LS4-1), (MSLS4-2), (MS-LS4-3), (MS-LS4-4) ,(MS-LS4-5) **RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-LS4-1), (MS-LS4-3) **RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (MS-LS4-3), (MS-LS4-4) **WHST.6-8.2** Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content. (MS-LS4-2), (MS-LS4-4) **WHST.6-8.8** Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism	**MP.4** Model with mathematics. (MS-LS4-6) **6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-LS4-4), (MS-LS4-6) **6.SP.B.5** Summarize numerical data sets in relation to their context. (MS-LS4-4), (MS-LS4-6) . **6.EE.B.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. (MS-LS4-1), (MS-LS4-2) **7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-LS4-4), (MS-LS4-6)	**Patterns** Patterns can be used to identify cause and effect relationships. (MS-LS4-2) Graphs, charts, and images can be used to identify patterns in data. (MS-LS4-1), (MS-LS4- 3) **Cause and Effect** Phenomena may have more than one cause, and some cause and effect relationships in systems can only be described using probability. (MS-LS4-4), (MS-LS4-5), (MS-LS4-6)	**Interdependence of Science, Engineering, and Technology** Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-LS4-5)	McGraw-Hill Inspire Science

and following a standard format for citation. (MS-LS4-5) **WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. (MS-LS4-2), (MS-LS4-4) **SL.8.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly. (MS-LS4-2), (MS-LS4-4) **SL.8.4** Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation. (MS-LS4-2), (MS-LS4-4)				

Grade 6, 7, 8				
Physical Sciences				
MS-PS1		**Matter and Its Interactions**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. MS-PS1-2. Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. MS-PS1-6. Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.*	**Developing and Using Models** Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems. ● Develop a model to predict and/or describe phenomena. (MS-PS1-1),(MS-PS1-4) ● Develop a model to describe unobservable mechanisms. (MS-PS1-5) **Analyzing and Interpreting Data** Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ● Analyze and interpret data to determine similarities and differences in findings. (MS-PS1-2) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and	● **PS1.A: Structure and Properties of Matter** Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. (MS-PS1-1) ● Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-2), (MS-PS1-3) ● Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. (MS-PS1-4) ● In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

	progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories. ● Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints. (MSPS1-6) **Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 6–8 builds on K–5 and progresses to evaluating the merit and validity of ideas and methods. ● Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-PS1-3)	in position but do not change relative locations. (MS-PS1-4) ● Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS-PS1-1) ● The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. (MS-PS1-4) **PS1.B: Chemical Reactions** ● Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. (MS-PS1-2), (MS-PS1-3), (MS-PS1-5) ● The total number of each type of atom is conserved, and thus the mass does not change. (MS-PS1-5) Some chemical reactions release energy, others store energy. (MS-PS1-6) **PS3.A: Definitions of Energy**		

		• The term “heat” as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary to MSPS1-4) • The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system’s material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the		

		system, and the state of the material. (secondary to MS-PS1-4) **ETS1.B: Developing Possible Solutions** ● A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (secondary to MS-PS1-6) **ETS1.C: Optimizing the Design Solution** ● Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of the characteristics may be incorporated into the new design. (secondary to MS-PS1-6) ● The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (secondary to MS-PS1-6)		

Interdisciplinary ELA	Interdisciplinary Mathematics	21st Century and Career Integration	Technology Integration	Core and Supplemental Instructional Materials
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions (MS-PS1-2), (MSPS1-3) **RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (MS-PS1-6) **RST.6-8.7** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-PS1-1), (MS-PS1-2), (MS-PS1-4), (MS-PS1-5) **WHST.6-8.7** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-PS1-6) **WHST.6-8.8** Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-PS1-3)	**MP.2** Reason abstractly and quantitatively. (MS-PS1-1), (MS-PS1-2), (MS-PS1-5) **MP.4** Model with mathematics. (MS-PS1-1), (MS-PS1-5) **6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-PS1-1), (MS-PS1-2), (MS-PS1-5) **6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (MS-PS1-4) **8.EE.A.3** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. (MS-PS1-1) **6.SP.B.4** Display numerical data in plots on a number line, including dot plots, histograms, and box plots. (MS-PS1-2) **6.SP.B.5** Summarize numerical data sets in relation to their context (MS-PS1-2)	**Patterns** Macroscopic patterns are related to the nature of microscopic and atomic-level structure. (MS-PS1-2) **Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4) **Scale, Proportion, and Quantity** Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-1) **Energy and Matter** Matter is conserved because atoms are conserved in physical and chemical processes. (MS-PS1-5) The transfer of energy can be tracked as energy flows through a designed or natural system. (MS-PS1-6) **Structure and Function** Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS1-3)	**Interdependence of Science, Engineering, and Technology** Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-PS1-3) **Influence of Science, Engineering and Technology on Society and the Natural World** The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. (MS-PS1-3)	McGraw-Hill Inspire Science

Grade 6, 7, 8				
Physical Sciences				
MS-PS2		**Motion and Stability: Forces and Interactions**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects. MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. MS-PS2-5. Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.	**Asking Questions and Defining Problems** Asking questions and defining problems in grades 6–8 builds from grades K–5 experiences and progresses to specifying relationships between variables, and clarifying arguments and models. ● Ask questions that can be investigated within the scope of the classroom, outdoor environment, and museums and other public facilities with available resources and, when appropriate, frame a hypothesis based on observations and scientific principles. (MS-PS2-3) **Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions. ● Plan an investigation individually and	**PS2.A: Forces and Motion** ● For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's third law). (MS-PS2-1) ● The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion. (MS-PS2-2) ● All positions of objects and the directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. In order to	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

	collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. (MS-PS2-2) ● Conduct an investigation and evaluate the experimental design to produce data to serve as the basis for evidence that can meet the goals of the investigation. (MS-PS2-5) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ● Apply scientific ideas or principles to design an object, tool, process or system. (MS-PS2-1) **Engaging in Argument from Evidence** Engaging in argument from evidence in 6–8 builds from K–5 experiences and progresses to constructing a convincing argument that supports or refutes	share information with other people, these choices must also be shared. (MSPS2-2) **PS2.B: Types of Interactions** ● Electric and magnetic (electromagnetic) forces can be attractive or repulsive, and their sizes depend on the magnitudes of the charges, currents, or magnetic strengths involved and on the distances between the interacting objects. (MS-PS2-3) ● Gravitational forces are always attractive. There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass—e.g., Earth and the sun. (MS-PS2-4) ● Forces that act at a distance (electric, magnetic, and gravitational) can be explained by fields that extend through space and can be mapped by their effect on a test object (a charged object, or a ball, respectively). (MS-PS2-5)		

	claims for either explanations or solutions about the natural and designed world. ● Construct and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-PS2-4)			
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions (MS-PS2-1), (MSPS2-3) **RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (MS-PS2-1), (MS-PS2-2), (MS-PS2- 5) **WHST.6-8.**1 Write arguments focused on discipline-specific content. (MS-PS2-4) **WHST.6-8.7** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-PS2-1), (MS-PS2-2), (MS-PS2-5)	**MP.2** Reason abstractly and quantitatively. (MS-PS2-1), (MS-PS2-2), (MS-PS2-3) **6.NS.C.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values; use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (MS-PS2-1) **6.EE.A.2** Write, read, and evaluate expressions in which letters stand for numbers. (MS-PS2-1), (MS-PS2-2) **7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form, using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental	**Cause and Effect** Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS2-3), (MS-PS2- 5) **Systems and System Models** Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy and matter flows within systems. (MS-PS2-1), (MS-PS2-4) **Stability and Change** Explanations of stability and change in natural or designed systems can be constructed by examining the changes over time and forces at different scales. (MS-PS2-2)	**Influence of Science, Engineering, and Technology on Society and the Natural World** The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. (MS-PS2-1)	McGraw-Hill Inspire Science

	computation and estimation strategies. (MS-PS2-1), (MS-PS2-2) **7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. (MS-PS2-1), (MS-PS2-2)			

Grade 6, 7, 8				
Physical Sciences				
MS-PS3		**Energy**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object. MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. MS-PS3-4. Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic	**Developing and Using Models** Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems. • Develop a model to describe unobservable mechanisms. (MS-PS3-2) **Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions.	• **PS3.A: Definitions of Energy** Motion energy is properly called kinetic energy; it is proportional to the mass of the moving object and grows with the square of its speed. (MS-PS3-1) • A system of objects may also contain stored (potential) energy, depending on their relative positions. (MS-PS3-2) • Temperature is a measure of the average kinetic energy of particles of matter. The relationship between the temperature and the total energy of a system	https://www.state.nj.us/education/modelcurriculum/sci/videos/ https://www.state.nj.us/education/aps/cccs/science/resources/QR68.pdf http://nstahosted.org/pdfs/ngss/resources/MatrixForK-12ProgressionOfScienceAndEngineeringPracticesInNGSS.8.14.14.pdf	Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

energy of the particles as measured by the temperature of the sample. MS-PS3-5. Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	● Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. (MS-PS3-4) **Analyzing and Interpreting Data** Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. ● Construct and interpret graphical displays of data to identify linear and nonlinear relationships. (MS-PS3-1) **Constructing Explanations and Designing Solutions** Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories. ● Apply scientific ideas or principles to design,	depends on the types, states, and amounts of matter present. (MS-PS3-3), (MS-PS3-4) **PS3.B: Conservation of Energy and Energy Transfer** ● When the motion energy of an object changes, there is inevitably some other change in energy at the same time. (MS-PS3-5) ● The amount of energy transfer needed to change the temperature of a matter sample by a given amount depends on the nature of the matter, the size of the sample, and the environment. (MS-PS3-4) ● Energy is spontaneously transferred out of hotter regions or objects and into colder ones. (MS-PS3-3) **PS3.C: Relationship Between Energy and Forces** ● When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object. (MS-PS3-2) **ETS1.A: Defining and Delimiting an Engineering Problem** ● The more precisely a design task's criteria and constraints can be		

	construct, and test a design of an object, tool, process or system. (MS-PS3-3) **Engaging in Argument from Evidence** Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed worlds. ● Construct, use, and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon. (MS-PS3-5)	defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. (secondary to MS-PS3-3) **ETS1.B: Developing Possible Solutions** ● A solution needs to be tested, and then modified on the basis of the test results in order to improve it. There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem. (secondary to MS-PS3-3)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions (MS-PS3-1), (MSPS3-5) **RST.6-8.3** Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (MS-PS3-3), (MS-PS3-4) **RST.6-8.7** Integrate quantitative or technical information	**MP.2** Reason abstractly and quantitatively. (MS-PS3-1), (MS-PS3-4), (MS-PS3-5) **6.RP.A.1** Understand the concept of ratio and use ratio language to describe a ratio relationship between two quantities. (MS-PS3-1), (MS-PS3-5) **6.RP.A.2** Understand the concept of a unit rate a/b associated with a ratio a:b with b $\neq 0$, and use rate language in the	**Scale, Proportion, and Quantity** Proportional relationships (e.g. speed as the ratio of distance traveled to time taken) among different types of quantities provide information about the magnitude of properties and processes. (MS-PS3-1), (MS-PS3-4) **Systems and System Models** Models can be used to represent systems and their interactions – such as inputs, processes, and		McGraw-Hill Inspire Science

expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (MS-PS3-1) **WHST.6-8.1** Write arguments focused on discipline content. (MS-PS3-5) **WHST.6-8.7** Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-PS3-3), (MS-PS3-4) **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. (MS-PS3-2)	context of a ratio relationship. (MS-PS3-1) **7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-PS3-1), (MS-PS3-5) **8.EE.A.1** Know and apply the properties of integer exponents to generate equivalent numerical expressions. (MS-PS3-1) **8.EE.A.2** Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational. (MS-PS3-1) **8.F.A.3** Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. (MS-PS3-1), (MSPS3-5) **6.SP.B.5** Summarize numerical data sets in relation to their context. (MS-PS3-4)	outputs – and energy and matter flows within systems. (MS-PS3-2) **Energy and Matter** Energy may take different forms (e.g. energy in fields, thermal energy, energy of motion). (MS-PS3- 5) The transfer of energy can be tracked as energy flows through a designed or natural system. (MSPS3-3)		

Grade 6, 7, 8				
Physical Sciences				
MS-PS4		**Waves and Their Applications in Technologies for Information Transfer**		
Learning Standard	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Resources**	**Assessments**
MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.	**Developing and Using Models** Modeling in 6–8 builds on K–5 and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. ● Develop and use a model to describe phenomena. (MS-PS4-2) **Using Mathematics and Computational Thinking** Mathematical and computational thinking at the 6–8 level builds on K–5 and progresses to identifying patterns in large data sets and using mathematical concepts to support explanations and arguments. ● Use mathematical representations to describe and/or support scientific conclusions and design solutions. (MS-PS4-1) **Obtaining, Evaluating, and Communicating Information** Obtaining, evaluating, and communicating information in 6-8 builds on K-5 and progresses to evaluating the merit and validity of ideas and methods. ● Integrate qualitative scientific and technical	**PS4.A: Wave Properties** ● A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. (MS-PS4-1) ● A sound wave needs a medium through which it is transmitted. (MS-PS4-2) **PS4.B: Electromagnetic Radiation** ● When light shines on an object, it is reflected, absorbed, or transmitted through the object, depending on the object's material and the frequency (color) of the light. (MS-PS4-2) ● The path that light travels can be traced as straight lines, except at surfaces between different transparent materials (e.g., air and water, air and glass) where the light path bends. (MS-PS4-2) ● A wave model of light is useful for explaining brightness, color, and the frequency-dependent		Ask questions Define problems Develop and use models Plan and carry out investigations Analyze and interpret data Formative assessment Teacher observation Class discussion Venn diagram New Jersey Student Learning Assessment – Grade 8: Science (NJSLA-S)

	information in written text with that contained in media and visual displays to clarify claims and findings. (MS-PS4-3)	bending of light at a surface between media. (MS-PS4-2) ● However, because light can travel through space, it cannot be a matter wave, like sound or water waves. (MS-PS4-2) **PS4.C: Information Technologies and Instrumentation** ● Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information. (MS-PS4-3)		
Interdisciplinary ELA	**Interdisciplinary Mathematics**	**21st Century and Career Integration**	**Technology Integration**	**Core and Supplemental Instructional Materials**
RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts. (MS-PS4-3) **RST.6-8.2** Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (MS-PS4-3) **RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic. (MS-PS4-3) **WHST.6-8.9** Draw evidence from informational texts to support analysis, reflection, and research. (MS-PS4-3) **SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen	**MP.2** Reason abstractly and quantitatively. (MS-PS4-1) **MP.4** Model with mathematics. (MS-PS4-1) **6.RP.A.1** Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. (MS-PS4-1) **6.RP.A.3** Use ratio and rate reasoning to solve real-world and mathematical problems. (MS-PS4-1) **7.RP.A.2** Recognize and represent proportional relationships between quantities. (MS-PS4-1) **8.F.A.3** Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. (MS-PS4-1)	**Patterns** Graphs and charts can be used to identify patterns in data. (MS-PS4- 1) **Structure and Function** Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS4-2) Structures can be designed to serve particular functions. (MS-PS4-3)	**Influence of Science, Engineering, and Technology on Society and the Natural World** Technologies extend the measurement, exploration, modeling, and computational capacity of scientific investigations. (MS-PS4-3)	McGraw-Hill Inspire Science

claims and evidence, and add interest. (MS-PS4-1), (MS-PS4-2)				

Modifications/Accommodations

ELL	Alternate responses, extended time, teacher modeling, simplified directions, vocabulary banks, manipulatives, nonverbal responses, sentence frames, prompts, partner talk, advance notes
Special Education	Enlarged graph paper, small group instruction, highlighted instructions/keywords and/or computation signs, hands on activities, visual cues, number line, modified assessment, models, use of calculator, enlarged coordinate grid paper
G&T	Enrichment activities, centers, projects, flexible grouping, interest centers, learning log, extension activities, small group

Pacing Guide for Science

	Physical Science	Earth Science	Life Science	Engineering
Grade K	K-PS2 Motion and Stability: Forces and Interactions K-PS3 Energy	K-ESS2 Earth's Systems K-ES3 Earth and Human Activity	K-LS1 From Molecules to Organisms: Structures and Processes	K-2 ETS1 Engineering Design
Grade 1	1- PS4 Waves and Their Applications for Information Transfer	1-ESS1 Earth's Place in the Universe	1-LS1 From Molecules to Organisms: Structures and Processes 1-LS3 Heredity: Inheritance and Variation of Traits	K-2 ETS1 Engineering Design
Grade 2	2-PS1 Matter and Its Interactions	2-ESS1 Earth's Place in the Universe 2-ESS2 Earth's Systems	2-LS2 Ecosystems: Interactions, Energy, and Dynamics 2-LS4 Biological Evolution: Unity and Diversity	K-2 ETS1 Engineering Design
Grade 3	3-PS2 Motion and Stability: Forces and Interactions	3-ESS2 Earth's Systems 3-ES3 Earth and Human Activity	3-LS1 From Molecules to Organisms: Structures and Processes 3-LS2 Ecosystems: Interactions, Energy, and Dynamics 3-LS3 Heredity: Inheritance and Variation of Traits 3-LS4 Biological Evolution: Unity and Diversity	3-5 Engineering and Design
Grade 4	4-PS3 Energy 4-PS3 Waves and Their Applications for INformation Transfer	4-ESS1 Earth's Place in the Universe 4-ESS2 Earth's Systems 4-ES3 Earth and Human Activity	4-LS1 From Molecules to Organisms: Structures and Processes	3-5 Engineering and Design
Grade 5	5-PS1 Matter and Its Interactions 5-PS2 Motion and Stability: Forces and Interactions 5-PS3 Energy	5-ESS1 Earth's Place in the Universe 5-ESS2 Earth's Systems 5-ES3 Earth and Human Activity	5-LS1 From Molecules to Organisms: Structures and Processes 5-LS2 Ecosystems: Interactions, Energy, and Dynamics	3-5 Engineering and Design
Grade 6	MS PS1 (1-6) Matter and Its Interactions MS PS2 (1-5)Motion and Stability: Forces and Interactions MS PS3 (1-5)Energy	MS ESS1 (1-3)Earth's Place in the Universe MS ESS2 (2-6)Earth's Systems MS ESS3 (1) Earth and Human Activity	MS LS2 (1-2) Ecosystems: Interactions, Energy and Dynamics	MS ETS1 Engineering Design

	MS PS4 (1-2) Waves and Their Applications in Technologies for Information Transfer			
Grade 7	MS PS3 (2) Energy MS PS4 (2-3) Waves and Their Applications in Technologies for Information Transfer	MS ESS1 (1-2) Earth's Place in the Universe MS ESS2 (1,2,5,6) Earth's Systems MS ESS3 (2) Earth and Human Activity	MS LS1 (1-7) From Molecules to Organisms: Structures and Processes MS LS2 (3) Ecosystems: Interactions, Energy and Dynamics MS LS3 (1-2) Heredity: Inheritance and Variation of Traits	MS ETS1 Engineering Design
Grade 8		MS ESS1 (4) Earth's Place in the Universe MS ESS2 (3,5,6) Earth's Systems MS ESS3 (3-5) Earth and Human Activity	MS LS1 (8) From Molecules to Organisms: Structures and Processes MS LS2 (4,5) Ecosystems: Interactions, Energy and Dynamics MS LS4 (1-6) Biological Evolution: Unity and Diversity	MS ETS1 Engineering Design