

Readorium Scholar Alignment with Next Generation Science Standards: Middle School Grades 6-8

Readorium Content: In Readorium, either students choose **science books** from the Book Shelf that interest them, or teachers may lock or unlock specific books for classes, groups, or individuals. Once students receive tokens for completing books, they may select **magazine articles** from the Magazine Rack, or **National Science Foundation videos** from the Science Alive section of the library. They may also play learning games in Readorium's Village. Teachers can log into the **Teacher Resource Center** to view student data and download **strategy lessons with additional science articles**. **This chart shows the content available for students by NGSS standard.** Some content covers more than one standard.

Readorium Scholar Alignment with Next Generation Science Standards: Grades 6-8			
Next Generation Science Standards	Readorium Books By Standard	Magazine Articles (A) and Science Alive Videos (V) By Standard	Teacher Resource Center Classroom Strategy Lessons (CL) with Articles (A) by Standard
Middle School-Physical Science (MS-PS): Structure and Properties of Matter			
MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.	<ul style="list-style-type: none"> • Chemical and Physical Properties of Matter 1 • Chemical and Physical Properties of Matter 2 		<ul style="list-style-type: none"> • Determining Importance (CL-3, A-2 Crystals)
MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society	<ul style="list-style-type: none"> • Pollution 		
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.	<ul style="list-style-type: none"> • Chemical and Physical Properties of Matter 1 • Chemical and Physical Properties of Matter 2 • Formation of Volcanoes • Lights Sound Action • Plate Tectonics • Weather 		
Middle School-Physical Science (MS-PS): Chemical Reactions			
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.	<ul style="list-style-type: none"> • Chemical and Physical Properties of Matter 1 • Chemical and Physical Properties of Matter 2 	<ul style="list-style-type: none"> • Cafeteria Chemistry: How to Play with Your Food and Astound Your Friends (A) • Crystals (A) • Kitchen Chemistry (A) • The Cool World of Chemistry (A) 	<ul style="list-style-type: none"> • Creating Sensory Images (CL-1, A-2 Kitchen Chemistry) • Determining Importance (CL-3, A-2 Crystals)
MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in	<ul style="list-style-type: none"> • Chemical and Physical Properties of Matter 2 	<ul style="list-style-type: none"> • Gold - The Magnificent Metal (A) • Crystals (A) 	

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	<ul style="list-style-type: none"> • The Formation of Volcanoes 		
Middle School-Physical Science (MS-PS): Forces and Interactions			
MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.	<ul style="list-style-type: none"> • Newton's Laws • Scientists who Changed the World • Sports Physics 		
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.	<ul style="list-style-type: none"> • Newton's Laws • Scientists who Changed the World • Space Rocks! 		
MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	<ul style="list-style-type: none"> • Sea Floor Spreading 	<ul style="list-style-type: none"> • The Many Uses of Submarines (A) 	
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.	<ul style="list-style-type: none"> • Lives of Stars • Scientists who Changed the World • Total Lunacy 		
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.	<ul style="list-style-type: none"> • Sea Floor Spreading • Total Lunacy • Scientific Method 		
Middle School-Physical Science (MS-PS): Energy			
MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the	<ul style="list-style-type: none"> • Lights Sound Action • Sports Physics • Newton's Laws 	<ul style="list-style-type: none"> • 25 Fascinating Facts About Humans (A) • The Rhymes and Riddles of Science (A) • 25 Scrumptious Facts About 	

mass of an object and to the speed of an object.		Food (A) <ul style="list-style-type: none"> • 50 Amazing Animal Facts (A) • 50 Fun Facts That Will Amaze Your Friends (A) 	
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.	<ul style="list-style-type: none"> • Sports Physics 	<ul style="list-style-type: none"> • Weapons Older than Dirt: The History of Some of the World's Most Ancient Weapons (A) • Things That Go BOOM!: The History and Chemistry of Explosives (A) 	
MS-PS3-3. Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	<ul style="list-style-type: none"> • Lights Sound Action 		
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 energy of the particles as measured by the temperature of the sample.	<ul style="list-style-type: none"> • Lights Sound Action 	<ul style="list-style-type: none"> • Space Junk: Are We Trashing our Solar System? (A) 	
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.	<ul style="list-style-type: none"> • Lights Sound Action • Sports Physics 	<ul style="list-style-type: none"> • Weapons Older than Dirt: The History of Some of the World's Most Ancient Weapons (A) • Machines of Ancient War: The Physics and History of Siege Engines (A) 	
Middle School-Physical Science (MS-PS): Waves and Electromagnetic Radiation			
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.		<ul style="list-style-type: none"> • Sounds and Hearing 	
MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	<ul style="list-style-type: none"> • Lights Sound Action • Space Rocks! 		
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.			
MS-LS-Structure, Function, and Information Processing			
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.	<ul style="list-style-type: none"> • Microscopes • Nature's Weird Surprises • Our Bodies • Genetics: Why We Look the Way We Do • The Formation and Growth of Human Life - Mitosis and Meiosis 		<ul style="list-style-type: none"> • Making Connections & Synthesizing (CL-1, A-2 The Warrior Gene)
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.	<ul style="list-style-type: none"> • Genetics: Why We Look the Way We Do • Microscopes: Seeing the Tiny World) 		
MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.	<ul style="list-style-type: none"> • Becoming and Staying Healthy • Nature's Weird Surprises • Our Bodies 		
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.	<ul style="list-style-type: none"> • Our Bodies: The Most Marvelous Machines 		<ul style="list-style-type: none"> • Making Connections/ Synthesizing (CL-3, A-2 The Limits of the Human Body) • Context Clues (CL-1, A-2 Making Memories) • Creating Sensory Images (CL-2, A-1 The Call of the Tinamou) • Inferring (CL-2, A-2 Video Games)
Middle School-Life Science (MS-LS): Matter and Energy in Organisms and Ecosystems			
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	<ul style="list-style-type: none"> • Chemical and Physical Properties of Matter 2 • Coral Reefs • Life Research Ship 	<ul style="list-style-type: none"> • Artificial Reefs: How and Why We Build Them (A) 	<ul style="list-style-type: none"> • Determining Importance (CL-1, A-1, A Place with Many Levels) <i>may be a stretch</i> • Monitor for Meaning CL-3 A-1 Sharing the Sun)

out of organisms.			
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.	<ul style="list-style-type: none"> • Chemical and Physical Properties of Matter 1 • Our Bodies 	<ul style="list-style-type: none"> • Artificial Blood! (A) • Deadly Mushrooms (A) 	
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.	<ul style="list-style-type: none"> • Coral Reefs • Desert Biomes • Life in the Tundra • Prairie Ecosystems • Scientific Method 	<ul style="list-style-type: none"> • Why do Some Animals Eat their Own Kind? (A) • Invasive Species (A) • Pirate Spiders(A) • Animal Cannibals (A) • A Spider with Deadly Aim (A) • Spitting Spiders (A) • Looks like an Ant... Or Does It? (A) • The Venomous Sea Wasp (A) • The World's Most Disgusting Animal: The Hagfish (A) • The Adventure of Keeping an Aquarium} (A) • A Weird Animal: The Binturong (A) • Carnivorous Dinosaurs (A) • Bones Tell the Story (A) • Getting DNA Out of Ancient Fossils (A) • Selective Breeding, Genetic Engineering, and Pedigrees (A) • Ant Activists (V) • Birds Strut their Stuff(V) • Make Way for Ducklings(V) • Orangutans See, Orangutans Do?(V) • Snaking Around(V) • Squid: Underwater Masters of Disguise (V) • Taking the Bite Out of Mosquito Bites (V) • Totally Batty(V) 	<ul style="list-style-type: none"> • Making Connections & Synthesizing (CL-3, A-1 The Lynx and the Hare: Predator-Prey Relationships) • Context Clues CL-3 A-2, What Happens When Something Goes Extinct?) • Graphic Features (CL-1, A-1 What is Happening to the Bluefin Tuna?) • Inferring (CL-1, A-2 Animal Cannibals) • Print Features CL-3 A-1 Home Sweet Home: Dens and Other Shelters) • Monitor for Meaning (CL-1, A-1 Lizard Lifestyles) • Monitor for Meaning CL-2, A-1 Great Barrier Reef) • Monitor for Meaning (CL-2, A-2 Is that Popcorn? No, it's a Binturaong! • Inferring (CL-3 A-1 Meet a Scientist)
MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	<ul style="list-style-type: none"> • Prairie Ecosystems 	<ul style="list-style-type: none"> • Artificial Reefs: How and Why We Build Them (A) • Garbage Island (A) 	<ul style="list-style-type: none"> • Determining Importance (CL-2, A-2 Garbage Island) • Monitor for Meaning (CL-1, A-2 Reflections on Dead Wood)

<p>MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.</p>	<ul style="list-style-type: none"> • Desert Biomes • Prairie Ecosystems • Rainforests 	<ul style="list-style-type: none"> • Artificial Reefs: How and Why We Build Them (A) • Crime-Solving Insects (A) • Garbage Island (A) • How Plants Trick Animals (A) • Life Inside Deep Caves (A) • Parasites: Nature's Thieves (A) • The Illegal Wildlife Trade (A) • What Happens When Something Goes Extinct? (A) 	<ul style="list-style-type: none"> • Context Clues (CL-1, A-1 Life Inside Deep Caves) • Context Clues CL-3 A-2 When Something Goes Extinct) • Determining Importance (CL-2, A-2 Garbage Island) • Graphic Features (CL-1, A-1 What is Happening to the Bluefin Tuna?) • Making Connections & Synthesizing (CL-3, A-1 The Lynx and the Hare: Predator-Prey Relationships) • Monitor for Meaning (CL-3 A-2 A Wildlife Trade) • Print Features CL-2, A-1 Bats) • Print Features (CL-2, A-2 Plants that Trick Animals!) (CL-2, A-2 Garbage Island)
<p>Middle School-Life Science (MS-LS): Interdependent Relationships in Ecosystems</p>			
<p>MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.</p>	<ul style="list-style-type: none"> • Life in the Tundra • Prairie Ecosystems • Surviving in Nature 		<ul style="list-style-type: none"> • Print Features (CL-1, A-1 Symbiosis: Living Together and Loving It) • Monitor for Meaning CL-2, A-1 Great Barrier Reef) • Monitor for Meaning (CL-2, A-2 Is that Popcorn? No, it's a Binturaong!
<p>MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.</p>	<ul style="list-style-type: none"> • Surviving in Nature 		
<p>Middle School-Life Science (MS-LS): Growth, Development, and Reproduction of Organisms</p>			
<p>MS-LS1-4. Use argument 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.</p>	<ul style="list-style-type: none"> • Desert Biomes • Life in the Tundra • Nature's Weird Surprises • Prairie Ecosystems • Scientists who Changed the World • Surviving in Nature 	<ul style="list-style-type: none"> • Bones Tell the Story (A) • How Plants Trick Animals (A) • Animal Magnetism! (V) 	<ul style="list-style-type: none"> • Creating Sensory Images (CL-1, A-1 The Rainforest Awakens My Senses) • Creating Sensory Images (CL-3 A-2, An Afternoon Rain) • Determining Importance (CL-2, A-1 Dragonflies: Flying Aces) • Determining Importance (CL-3, A-1 An Anchor in the Storm)

			<ul style="list-style-type: none"> • Making Connections/ Synthesizing (CL-3, A-1 The Lynx and the Hare: Predator-Prey Relationships) • Print Features (CL-2, A-2 Plants that Trick Animals!) • Print Features CL-2, A-1 Bats) • Inferring (CL-2, A-1 Sloth Stories) • Print Features CL-3 A-1 Home Sweet Home: Dens and Other Shelters) • Monitor for Meaning CL-3 A-1 Sharing the Sun)
<p>MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms</p>	<ul style="list-style-type: none"> • Formation of Growth: Mitosis and Meiosis • Genetics • Scientists who Changed the World • Surviving in Nature 	<ul style="list-style-type: none"> • The Teenage Brain - Why Teens Act so Twisted! (A) • The Tiniest Killers (A) • How Video Games Affect Your Personality (A) • Pimples, Whiteheads, and Blackheads, Oh No! (A) • The Warrior Gene (A) • The Brain!...What's in There? (A) • Strange Medical Conditions (A) • The Black Death (A) • Life Near Undersea Vents (A) • Cloning: The More the Merrier (A) • Animal Magnetism! (V) • Bird Brains (V) • Fascinating Flights (V) • Insects and Team Work (V) 	<ul style="list-style-type: none"> • Determining Importance (CL-1, A-1, A Place with Many Levels) • Graphic Features (CL-1, A-1 What is Happening to the Bluefin Tuna?) • Making Connections & Synthesizing (CL-1, A-1 A Marsupial for Every Occasion) • Making Connections/ Synthesizing (CL-3, A-2 The Limits of the Human Body) • Print Features CL-2, A-1 Bats)
<p>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.</p>	<ul style="list-style-type: none"> • Desert Biomes • Surviving in Nature 	<ul style="list-style-type: none"> • How Video Games Affect Your Personality (A) • Strange Medical Conditions (A) 	
<p>MS-LS3-2. Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in</p>	<ul style="list-style-type: none"> • Formation of Growth: Mitosis and Meiosis • Genetics 		

offspring with genetic variation.			
MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	<ul style="list-style-type: none"> • Genetics • Surviving in Nature • Pollution 		<ul style="list-style-type: none"> • Making Connections & Synthesizing (CL-3, A-2 The Limits of the Human Body)
Middle School-Life Science (MS-LS): Natural Selection and Adaptations			
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.	<ul style="list-style-type: none"> • Surviving in Nature 		<ul style="list-style-type: none"> • Context Clues (CL-1, A-1 Life Inside Deep Caves) • Context Clues CL-2, A-1 Life at the Top) • Context Clues CL-3 A-2, What Happens When Something Goes Extinct) • Creating Sensory Images (CL-2, A-1 The Call of the Tinamou)
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.	<ul style="list-style-type: none"> • Desert Biomes • Nature’s Weird Surprises • Scientists who Changed the World • Surviving in Nature 	<ul style="list-style-type: none"> • From Blinking to Thinking: The Amazing Human Brain (A) 	<ul style="list-style-type: none"> • Context Clues (CL-1, A-1 Life Inside Deep Caves)
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.	<ul style="list-style-type: none"> • Surviving in Nature 	<ul style="list-style-type: none"> • The Very Peculiar Anglerfish (A) 	
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.	<ul style="list-style-type: none"> • Caves • Desert Biomes • Life in the Tundra • Prairie Ecosystems • Scientists who Changed the World • Surviving in Nature 	<ul style="list-style-type: none"> • Teeth (A) • The Limits of the Human Body (A) • Girls in Science Series: Part 1 (A) • Girls in Science Series: Part 2 (A) • Girls in Science Series: Part 3 (A) • Girls in Science Series: Part 4 (A) • Girls in Science Series: Part 5(A) • Girl Powered Science (V) 	<ul style="list-style-type: none"> • Context Clues (CL-1, A-1 Life Inside Deep Caves) • Making Connections/ Synthesizing (CL-1, A-1, A Marsupial for Every Occasion) • Making Connections/ Synthesizing (CL-2, A-1 Tamarins Make a Great Day in the Forest)

<p>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.</p>	<ul style="list-style-type: none"> • Scientists who Changed the World • Surviving in Nature 		<ul style="list-style-type: none"> • Context Clues (CL-1, A-1 Life Inside Deep Caves)
<p>Middle School-Earth & Space Science (MS-ESS): Space Systems</p>			
<p>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.</p>	<ul style="list-style-type: none"> • Total Lunacy • Earth in Motion • Inner and Outer Planets 		
<p>MS-ESS1-2. Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.</p>	<ul style="list-style-type: none"> • Total Lunacy • Lives of Stars • Space Rocks! 	<ul style="list-style-type: none"> • Space Junk: Are We Trashing our Solar System?(A) • The Deep Mystery of Black Holes (A) • Sparkling Sunspots(V) • Gaps in the Galaxies(V) 	
<p>MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system</p>	<ul style="list-style-type: none"> • Inner and Outer Planets 		<ul style="list-style-type: none"> • Context Clues (CL-2, A-2, The Search for Life on Mars)
<p>Middle School-Earth & Space Science (MS-ESS): History of Earth</p>			
<p>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.</p>	<ul style="list-style-type: none"> • Big Delicious Earth 		
<p>MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth’s surface at varying time and spatial scales.</p>	<ul style="list-style-type: none"> • Big Delicious Earth • Caves • Continental Drift • Earthquakes • Formation of Mountains and Deserts • Plate Tectonics • Sea Floor Spreading 	<ul style="list-style-type: none"> • Crystals(A) • Icy Evidence in the Core (V) • Science on Ice (V) • Hurricane Hunting (V) • Twist and Shout: Tornado Trouble (V) 	<ul style="list-style-type: none"> • Determining Importance (CL-3, A-2 Crystals)
<p>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.</p>	<ul style="list-style-type: none"> • Continental Drift • Earthquakes • Form Mountains • Plate Tectonics • Sea Floor Spreading 	<ul style="list-style-type: none"> • Getting DNA Out of Ancient Fossils 	

Middle School-Earth & Space Science (MS-ESS): Earth's Systems			
MS-ESS2-1. Develop a model to describe the cycling of Earth's materials and the flow of energy that drives this process.	<ul style="list-style-type: none"> • Prairie Ecosystems • Rainforests • Weather 	<ul style="list-style-type: none"> • Crazy Careers in Science (garbologist) • Inventor of the Toughest Stuff (A) • Icy Evidence in the Core(V) 	
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.	<ul style="list-style-type: none"> • Weather • Total Lunacy 		
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.	<ul style="list-style-type: none"> • Big Delicious Earth • Formation of Volcanoes 		
Middle School-Earth & Space Science (MS-ESS): Weather and Climate			
MS-ESS2-5. Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	<ul style="list-style-type: none"> • Weather • Form Mountains and Deserts 		
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.	<ul style="list-style-type: none"> • Desert Biomes • Earth in Motion • Life in the Tundra • Rainforests • Weather 		
MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	<ul style="list-style-type: none"> • Earth in Motion • Weather • Pollution • Rainforests 		
Middle School-Earth & Space Science (MS-ESS): Human Impacts			
MS-ESS3-2. Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to	<ul style="list-style-type: none"> • Coral Reefs • Learning from Natural Disasters • Weather 	<ul style="list-style-type: none"> • Space Junk: Are We Trashing our Solar System? (A) 	<ul style="list-style-type: none"> • Print Features CL-3 A-2 Flying Into a Hurricane)

mitigate their effects.			
MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	<ul style="list-style-type: none"> • Pollution • Prairie Ecosystems • Rainforests • Scientific Method 	<ul style="list-style-type: none"> • Bones Tell the Story (A) 	<ul style="list-style-type: none"> • Graphic Features (CL-1, A-2 What Happened to the Blue Whale?)
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.	<ul style="list-style-type: none"> • Coral Reefs (?) • Pollution • Prairie Ecosystems • Rainforests 		
Middle School-Engineering Design (MS-ETS): Engineering Design			
MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	<ul style="list-style-type: none"> • Artificial Satellites • Character Traits of a Good Scientist • Learning from Natural Disasters • Pollution 	<ul style="list-style-type: none"> • Inventor of the Toughest Stuff (A) • Antlers, Beaks, Geckos and Us (V) • Safe from Tsunamis (V) 	<ul style="list-style-type: none"> • Context Clues (CL-3 A-1 Things That Go Boom!) • Determining Importance (CL-2, A-1. Dragonflies: Flying Aces)
MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	<ul style="list-style-type: none"> • Superstition or Science 	<ul style="list-style-type: none"> • Things That Go BOOM!: The History and Chemistry of Explosives (A) • Crazy Careers in Science (A) • Space psychologist (A) • From Waste to Energy: Bacteria Gives a Boost(V) • Hydrogen Power(V) • Wave of the Future- Green Gasoline (V) • Pig Poop and Other Energy Sources (V) • Getting Ready for Earthquakes (V) • Chores Don't Have to be a Pain in the But...ler (V) • Musical Computer (V) • Robots of Your Dreams(V) • Robots with Whiskers (V) • Sensible Sensors (V) • Signing Made Simple (V) • Smart Cars!(V) • The Ins and Outs of the Brain (V) 	<ul style="list-style-type: none"> • Context Clues (CL-3 A-1 Things That Go Boom!)

		<ul style="list-style-type: none"> • Strong but Sensitive: Metal Foam (V) • Smart Helicopters (V) • X-Ray Vision: Beyond the Bones (V) • Picking Your Brain (V) • The Creative Brain (V) • The Good, the Bad, and the Baby (V) • What Makes Us Tick (V) • Locked-in Syndrome: Finding a Way Out (V) • Nanoparticles: Tiny Glowing Cancer Killers (V) • Tongue Driven (V) • Vision for Blind People - Fact or Fiction(V) • Extreme Bacteria (V) • Lord of the Tree Rings (V) • Coral Corrosion (V) • Disappearing Frogs (V) • Earthworm Invasion (V) • ESP: A Lab in a Can (V) • Flowing Free (V) • Virtual Wildfires (V) • Women Powered Robots (V) • Wave of the Future: Clean Ocean Energy (V) 	
<p>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.</p>	<ul style="list-style-type: none"> • Microscopes • Space Race • Superstition or Science 	<ul style="list-style-type: none"> • Do Scientists Cheat? (A) 	
<p>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.</p>	<ul style="list-style-type: none"> • Microscopes • Space Race • Scientific Method 		<ul style="list-style-type: none"> • Graphic Features (CL-2, A-1 High School Track)