Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
		Kindergarten	
Motion and Stability: Forces and Interactions	**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	Make a Rube Goldberg Machine Make a Mechanical Stegosaurus Tail Build a Mighty Machine Build a Vertical Jumping Machine	Construct a Crane Build a Cantilever
	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.	Build a Vertical Jumping Machine Make a Mechanical Stegosaurus Tail Make a Rube Goldberg Machine Control a Microraptor's Flight	Construct a Crane Build a Plane Powered By Stored Energy Build a Cantilever
Energy	**K-PS3-1.** Make observations to determine the effect of sunlight on Earth's surface	Engineer a Redwood Tree	Build a Blooming Flower
	K-PS3-2 Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area		
From Molecules to Organisms: Structures and Processes	**K-LS1-1.** Use observations to describe patterns of what plants and animals (including humans) need to survive.	Engineer a Bird Beak Camouflage an Animal Engineer a Redwood Tree Disperse Seeds Far and Wide	Make a Root System
Earth's Systems	**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.	Engineer a Bird Beak Make a Root System Control a Microraptor's Flight Engineer a Redwood Tree	Make a Honeycomb Structure

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
Earth and Human Activity	**K-ESS3-1.** Use a model to represent the relationship between the needs of different plants and animals (including humans) and the places they live.	Engineer a Bird Beak Design a Powerful Bird Wing Camouflage an Animal Make a Root System Design a Pinecone Engineer a Redwood Tree Disperse Seeds Far and Wide	
	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 humans on the land, water, air, and/or other living things in the local environment	Build a Hydroelectric Waterwheel Build a Plane Powered By Stored Energy	Build a Wind-Powered Speed Boat
Engineering Design	**K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	All design challenges	
	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.	All design challenges	
	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.	All design challenges	

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First Grade

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
Waves and their Applications in Technologies for Information Transfer	**1-PS4-1.** Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.	Make a Wave Machine Build a Signal Horn Build a Soundmaker Build a Communication Network	
	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.		Build a Dinosaur Shadow Box
	1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.	Build a Signal Horn Engineer an Electric Switch Build a “No Wire” Circuit Build a Soundmaker Build a Communication Network	Make a Wave Machine
From Molecules to Organisms: Structures and Processes	**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.	Camouflage an Animal Engineer a Bird Beak Build a Signal Horn Make a Mechanical Stegosaurus Tail	
Heredity: Inheritance and Variation of Traits	**1-LS1-2.** Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive.	Camouflage an Animal	Design a Microexpression Zoetrope

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	1-LS3-1. Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.	Design a Set of Mechanical Genes	Make a Root System Design a Pinecone Engineer a Redwood Tree Disperse Seeds Far and Wide Build a Blooming Flower
Earth's Place in the Universe	**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		
Engineering Design	**K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	All design challenges	
	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.	All design challenges	
	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.	All design challenges	

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
		Second Grade	
Matter and its Interactions	**2-PS1-1.** Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.	Build a "No Wire" Circuit Make a Honeycomb Structure	Build a Lightweight Airplane Wing
	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	All design challenges	
	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.	Build a 3D Object out of Tetrahedra Build a Flat Ball Take Apart a Household Appliance Make a Structure that Assembles Itself Build a DNA Origami Inspired Structure	Build a Lightweight Airplane Wing
	2-PS1-4. Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.		
Ecosystems, Interactions, Energy and Dynamics	**2-LS2-1.** Plan and conduct an investigation to determine if plants need sunlight and water to grow.		
Biological Evolution: Unity and Diversity	**2-LS2-2.** Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.	Disperse Seeds Far and Wide Design a Pinecone Build a Blooming Flower	

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats.	Engineer a Bird Beak Engineer an Octopus Suction Pad Build Octopus Chromatophores Design a Powerful Bird Wing Camouflage an Animal Control a Microraptor's Flight Invent a Bio•bot	Design a Pinecone
Earth's Place in the Universe	**2-ESS1-1.** Use information from several sources to provide evidence that Earth events can occur quickly or slowly.		
Earth's Systems	**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.	Map the Ocean Floor	
	2-ESS2-3. Obtain information to identify where water is found on Earth and that it can be solid or liquid.		
Engineering Design	**K-2-ETS1-1.** Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.	All design challenges	
	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.	All design challenges	

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	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.	All design challenges	

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
		Third Grade	
Motion and Stability: Forces and Interactions	**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.	Construct a Crane Make a Stable Boat Build a Helicopter Build a Flat Ball Build a Cantilever Build a Wind-Powered Speed Boat Make a Structure that Assembles Itself Engineer an Air-Powered Spinning Machine Build a Glider Build a Mighty Machine Build a Vertical Jumping Machine	Engineer a Flow Control System Make a Mechanical Stegosaurus Tail Build a Plane Powered By Stored Energy Build a Suspension Bridge Balance a Dinosaur
	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.	Build a Wind-Powered Speed Boat Make a Mechanical Stegosaurus Tail Construct a Crane Make a Rube Goldberg Machine Build a Hydroelectric Waterwheel Zipping Through the Ocean Make a Structure that Assembles Itself Engineer a Flow Control System	Build a Joystick Build a Plane Powered By Stored Energy Build a Helicopter Build a Cantilever
	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.	Make a Structure that Assembles Itself Build a "No Wire" Circuit Engineer an Electric Switch Engineer a Safe Stopping Robot	
	3-PS2-4. Define a simple design problem that can be solved by applying scientific ideas about magnets.	Make a Structure that Assembles Itself Build a Bubble Switch	

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
From Molecules to Organisms: Structures and Processes	**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.		
Ecosystems: Interactions, Energy and Dynamics	**3-LS2-1.** Construct an argument that some animals form groups that help members survive.		
Heredity: Inheritance and Variation of Traits	**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.	Design a Set of Mechanical Genes Engineer a Bird Beak	Control a Microraptor's Flight
	3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.	Engineer a Bird Beak Camouflage an Animal Engineer a Redwood Tree Disperse Seeds Far and Wide Control a Microraptor's Flight Build Octopus Chromatophores Make a Root System	Engineer an Octopus Suction Pad Design a Pinecone Design a Powerful Bird Wing
	3-LS4-1 Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.		
Biological Evolution: Unity and Diversity			

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	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.	Design a Set of Mechanical Genes Make a Mechanical Stegosaurus Tail Disperse Seeds Far and Wide Camouflage an Animal	Design a Pinecone Build a Blooming Flower Engineer a Redwood Tree Balance a Dinosaur
	3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, some cannot survive at all.		Camouflage an Animal
	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.		
Earth's Systems	**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.		
Earth and Human Activity	**3-ESS3-1.** Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard.	Engineer a Skyscraper for the Wind Build a Hydroelectric Waterwheel Engineer an Automated Wrapping Machine	Build a Suspension Bridge Engineer a Wind-Powered Water Pump Engineer an Electronic Water Level Detector
Engineering Design	**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.	All design challenges	

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	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.	All design challenges	
	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.	All design challenges	

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
		Fourth Grade	
Energy	**4-PS3-1.** Use evidence to construct an explanation relating the speed of an object to the energy of that object.	Engineer an Air-Powered Spinning Machine Design a Wind Up Mars Rover Zipping Through the Ocean Build a Plane Powered By Stored Energy Build a Wind-Powered Speed Boat Belt Mechanism Cam Mechanism Crank Mechanism Build a Hydroelectric Waterwheel Engineer a Wind-Powered Water Pump Build a Self-Propelling Boat	Construct a Crane Build a Self-Powered Rocket Build a Stomp rocket Build a Cantilever Build a Helicopter Gravity Design Challenge Make a Mechanical Theater Make a Rube Goldberg Machine Engineer a Balloon Helicopter Make a Wave Machine Engineer a Flow Control System Make a Mechanical Stegosaurus Tail
	4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	Engineer an Electric Switch Build a "No Wire" Circuit Build a Joystick Generate Electricity to Light up an LED Create a Circuit to Light up an LED Make a Wave Machine Engineer a Flow Control System Build a Signal Horn Engineer a Safe Stopping Robot Engineer an Exoskeleton Hack a Box Engineer an Electric Switch Make a Rube Goldberg Machine Build a Soundmaker Build a Communication Network	Build a Signal Horn Engineer an Electronic Water Level Detector Build a Soundmaker
	4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide.	Make a Rube Goldberg Machine	Make a Mechanical Stegosaurus Tail

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	Engineer a Safe Stopping Robot Build a Self-Powered Rocket Build a Wind-Powered Speed Boat Crank Mechanism Belt Mechanism Cam Mechanism Build a Plane Powered By Stored Energy Generate Electricity to Light up an LED Build a Hydroelectric Waterwheel Engineer a Wind-Powered Water Pump Engineer a Balloon Helicopter Build a Mighty Machine Build a Vertical Jumping Machine Make a Rube Goldberg Machine Build a Self-Propelling Boat Engineer an Air-Powered Spinning Machine	Build a Joystick Construct a Crane Build a Cantilever Engineer an Electronic Water Level Detector Engineer an Electric Switch
Waves and their Applications in Technologies in Information Transfer	**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.	Make a Wave Machine In Production: metamaterials	Build a Communication Network
	4-PS4-2. Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.		In Production: metamaterial
	4-PS4-3. Generate and compare multiple solutions that use patterns to transfer information.	Make a Wave Machine Build a Joystick Build a Communication Network	Build a 3D Object out of Tetrahedra Build a “No Wire” Circuit
From Molecules to Organisms: Structures and	**4-LS1-1.** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and	Control a Microraptor's Flight Engineer a Bird Beak Engineer an Octopus Suction Pad	Design a Set of Mechanical Genes

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
Processes	reproduction.	Make a Mechanical Stegosaurus Tail Design a Powerful Bird Wing Design a Streamlined Fish Build a Mighty Machine Camouflage an Animal Make a Root System Design a Pinecone Engineer a Redwood Tree Make a Honeycomb Structure Disperse Seeds Far and Wide Build a Blooming Flower Balance a Dinosaur Design a Set of Mechanical Genes	
	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.	Build a Robotic Face Invent a Bio•bot Build a Signal Horn Camouflage an Animal Build Octopus Chromatophores	Build a Blooming Flower Design a Pinecone
Earth's Place in the Universe **Earth's Systems**	**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.		
	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.	Engineer an Electronic Water Level Detector	
Earth and Human Activity	**4-ESS2-2.** Analyze and interpret data from maps to describe patterns of Earth's features.		Map the Ocean Floor

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	Build a Hydroelectric Waterwheel Engineer a Wind-Powered Water Pump In Production: Sustainable House	Build a Plane Powered By Stored Energy
	4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	Engineer a Wind-Powered Water Pump Build a Water Filter Generate Electricity to Light up an LED Engineer an Electronic Water Level Detector In Production: Sustainable House	Deploy a Satellite Skyscraper for the Wind Build a Suspension Bridge Build a Long Spanning Wing
Engineering Design	**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.	All design challenges	
	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.	All design challenges	
	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.	All design challenges	

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
		Fifth Grade	
Matter and its Interactions	**5-PS1-1.** Develop a model to describe that matter is made of particles too small to be seen.	Make a Structure that Assembles Itself Build a "No Wire" Circuit	Zipping Through the Ocean Build a Submarine Build a Wind-Powered Speed Boat Build a Plane Powered By Stored Energy Engineer an Airfoil Engineer a Pneumatic Creature
	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.	Build a "No Wire" Circuit Build a Water Filter Build a Lightweight Airplane Wing Make a Structure that Assembles Itself	
	5-PS1-4. Conduct an investigation to determine whether the mixing of two or more substances results in new substances.	Build an Automated Wrapping Machine	Make the Perfect Dip Recipe
Motion and Stability: Forces and Interactions	**5-PS2-1** Support an argument that the gravitational force exerted by earth on objects is directed down.	Balance a Dinosaur Engineer a Landing Device Skyscraper for the Wind Build a Suspension Bridge Build a Long Spanning Wing	
Energy	**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.		

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
From Molecules to Organisms: Structures and Processes	**5-LS1-1.** Support an argument that plants get the materials they need for growth chiefly from air and water.	Make a Root System	Engineer a Redwood Tree
Ecosystems: Interactions, Energy and Dynamics	**5-LS2-1.** Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.	Disperse Seeds Far and Wide	Build a Blooming Flower Make a Root System
Earth's Place in the Universe	**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 the earth.		
	5-ESS1-2 Represent data in graphical displays to reveal patterns in daily changes of length and direction of shadows, day and night, and the seasonal appearance of some stars in the night sky.		
Earth's Systems	**5-ESS2-1.** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.		
	5-ESS2-2. Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.		
Earth and Human Activity	**5-ESS3-1.** Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.	Engineer an Electronic Water Level Detector Build a Water Filter Build a Hydroelectric Waterwheel	

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
		Generate Electricity to Light up an LED Engineer a Wind-Powered Water Pump Build a Plane Powered By Stored Energy In Production: Sustainable House	
Engineering Design	**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.	All design challenges	
	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.	All design challenges	
	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.	All design challenges	

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	Sixth - Eighth Grade		
Matter and Its Interactions	**MS-PS1-1.** Develop models to describe the atomic composition of simple molecules and extended structures.		Build a DNA-Inspired Origami Structure Build a 3D Object out of Tetrahedra Make a Structure that Assembles Itself
	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.		
Motion and Stability: 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.	Make a Rube Goldberg Machine	Mighty Machine Vertical Jumping Machine

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	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.	Build a Helicopter Balance a Dinosaur Engineer a Balloon Helicopter Engineer an Airfoil	Make a Rube Goldberg Machine Control a Microraptor's Flight Build a Glider Build a Plane Powered By Stored Energy
	MS-PS2-3. Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.	Make a Structure that Assembles Itself Build a "No Wire" Circuit Generate Electricity to Light up an LED Engineer an Electric Switch	Build a Hydroelectric Waterwheel
	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.	Engineer a Landing Device	Mighty Machine Vertical Jumping Machine
	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.	Make a Structure that Assembles Itself Build a "No Wire" Circuit	Engineer an Electric Switch Generate Electricity to Light up an LED
Energy	**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.	Build a Helicopter Build a Self-Propelling Boat Design a Wind Up Mars Rover Design a Wind-Powered Sailboat Make a Rube Goldberg Machine Build a Plane Powered By Stored Energy Build a Glider	Build a Vertical Jumping Machine Mighty Machine
	MS-PS3-2. Develop a model to describe that when the arrangement of objects interacting at a	Build a Plane Powered By Stored Energy Build a Mighty Machine	Build a Helicopter Make a Structure that Assembles Itself

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	distance changes, different amounts of potential energy are stored in the system.	Build a Vertical Jumping Machine Make a Rube Goldberg Machine Construct a Crane	
	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 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.	Engineer an Air-Powered Spinning Machine Build a Hydroelectric Waterwheel Engineer a Wind-Powered Water Pump Build a Plane Powered By Stored Energy Make a Mechanical Stegosaurus Tail Engineer a Safe Stopping Robot	Make a Rube Goldberg Machine Design a Wind-Powered Sailboat
Waves and Their Applications in Technologies for Information Transfer	**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.		Make a Wave Machine Build a Communication Network
	MS-PS4-2. Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	Make a Wave Machine Build a Communication Network In Production: Metamaterials	
	MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that		Build a Communication Network

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	digitized signals are a more reliable way to encode and transmit information than analog signals.		
From Molecules to Organisms: Structures and Processes	**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.		Design a Set of Mechanical Genes
	MS-LS1-3. Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.		
	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.	Design a Pinecone Design a Set of Mechanical Genes Camouflage an Animal Disperse Seeds Far and Wide Engineer a Bird Beak	Build a Blooming Flower Engineer a Redwood Tree
	MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	Design a Set of Mechanical Genes	Engineer a Bird Beak
	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.		

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	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.		Build a Robotic Face
Ecosystems: Interactions, Energy, and Dynamics	**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.	Engineer a Bird Beak	Design a Set of Mechanical Genes Build a Blooming Flower Engineer a Redwood Tree
	MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.		
	MS-LS2-3. Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	Engineer an Electronic Water Level Detector	
	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.	Engineer an Electronic Water Level Detector Build a Water Filter	Engineer a Bird Beak Camouflage an Animal

Curiosity Machine/NGSS K-8 Alignment

Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
Heredity: Inheritance and Variation of Traits	**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.	Design a Set of Mechanical Genes	Engineer a Bird Beak
	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 offspring with genetic variation.		Disperse Seeds Far and Wide Design a Set of Mechanical Genes Build a Blooming Flower
Biological Evolution: Unity and Diversity	**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.	Build a Dinosaur Shadow Box	
	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.	Build a Water Pump Control a Microraptor's Flight Balance a Dinosaur	Build a Dinosaur Shadow Box Engineer a Bird Beak
	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.		

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	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.	Engineer a Bird Beak Disperse Seeds Far and Wide	Design a Set of Mechanical Genes Design a Powerful Bird Wing Control a Microraptor's Flight Balance a Dinosaur
	MS-LS4-5. Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	Design a Set of Mechanical Genes	
	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.		
Earth's Place in the Universe	**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.		

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
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.		
	MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.		Map the Ocean Floor Build a Water Filter
	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.		Map the Ocean Floor
	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.	Build a Water Filter Engineer an Electronic Water Level Detector	
Earth and Human Activity	**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.		Build a Water Filter
	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.	Engineer an Electronic Water Level Detector	
	MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	Build a Hydroelectric Waterwheel Generate Electricity to Light up an LED Engineer a Wind-Powered Water Pump Engineer an Electronic Water Level	Build a Plane Powered By Stored Energy

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
		Detector In Production: Sustainable House	
	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.		Build a Plane Powered By Stored Energy
	MS-ESS3-5. Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.		
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.	Engineer an Electronic Water Level Detector Make a Water Transport Satellite Engineer a Safe Stopping Robot Hack a Box Engineer an Exoskeleton Engineer a Flow Control System In Production: Sustainable House	All Design Challenges
	MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	All	
	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.	All	
	MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed	All	

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Storyline	Standards	Well Aligned Design Challenges	Somewhat Aligned Design Challenges
	object, tool, or process such that an optimal design can be achieved.		