Aligned to Pre-Kindergarten Standards

Students actively connect themselves with the world around them by exploring and categorizing objects. They explore everyday movements and activities by developing ideas of routines and shared terminology.

Life Science: Living and Nonliving Things

Students explore characteristics of living and nonliving things. By examining habitats, students develop an understanding of what living things need in order to survive. They use the design process to sketch, build, and test an animal's shelter, then reflect on their design.

Matter: Floating and Sinking

Students develop an understanding of matter by examining solids and liquids through hands-on activities. They explore floating and sinking as they predict and observe what effect liquids have on different materials. Using the design process, students rely on their knowledge and skills of matter to sketch, build, test, and reflect on a design they have created that will float on water and keep items within the design dry.

Healthy Habits

Students develop an understanding of healthy habits and learn how food affects growth, gross motor skills (muscles), the heart, teeth, and eyes. They discover career connections as they learn about wellness checkups at the pediatrician, dentist, and optometrist. Students investigate how germs are spread and explore healthy habits to prevent the spread of germs. Using the knowledge and skills they've gained from the activities and project, students create a multimedia product to share what they've learned with others.

Spatial Sense and Coding

Students develop spatial sense as they engage in activities that explore directional movement – over, under, through, and around. They begin to develop coding skills as they plan a path, create wearable code, and code an interactive robotic device. Using the engineering design process, students create code that will lead them to the location of a hidden item.

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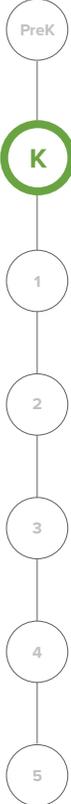
Aligned to Kindergarten Standards

Students observe phenomena with a purpose, and engage in making an impact on the world around them. They make choices of materials and designs in order to provide solutions to real-world problems.

Structure and Function: Exploring Design

Students discover the design process and how engineers influence their lives. They explore the elements of structure and function by identifying products around them designed by engineers and asking questions engineers might ask. They are introduced to a design problem through a story in which Angelina wants to design a paintbrush. Students apply their knowledge from the module to design their own paintbrushes.

Pushes and Pulls

Students investigate pushes and pulls on the motion of an object and develop knowledge and skills related to forces of differing strengths and directions. Their explorations include pushes and pulls found in their everyday world, such as pushing a friend on a swing or pulling a wagon. In this module's design problem, Suzi needs to move rocks from her yard so she can install a swing set. Students work through the problem by applying what they learn about forces.

Structure and Function: Human Body

Students explore the relationship between structure and function in the human body. They examine major organs within the body and investigate how the structure of each is related to its function. Students are introduced to the design problem through a story in which Angelina falls off the monkey bars and breaks her arm. Students learn about the diagnosis and treatment of her injury and then work to design and build a cast for Angelina.

Animals and Algorithms

Students explore the nature of computers and the ways humans control and use technology. Starting with an unplugged activity, students learn about the sequential nature of computer programs. Students are inspired by a story in which Angelina, Mylo, and Suzi make videos to teach preschoolers about animals in their habitats. Then, students work in small groups to design and program a simple digital animation about an animal in its habitat.

Sunlight and Weather

Students learn about the Sun's warming effect on Earth. They investigate how the Sun affects different Earth materials, which leads to how the Sun affects our weather. Students learn how to describe the weather to make observations and collect data. They use this data to describe patterns over time, which helps predict the weather. They view a local weather forecast to understand how the weather impacts their daily lives. Students practice how to dress for the day by dressing Angelina, Mylo, or Suzi based on a forecast. Then, they use the design process to design a structure that can reduce the Sun's warming effect.

Living Things: Needs and Impacts

Students investigate the needs of living things. During an outdoor walk, students look for plants and animals and consider how their needs are met in their natural environment. Then, they explore how living things impact the natural environment. They participate in a simulation to observe how an animal impacts the natural environment to meet its needs. Students then explore human needs and wants and how humans impact the natural environment, both positively and negatively. In an exercise to reduce waste, students use the design process to build a new game or toy out of reusable materials.

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Aligned to First Grade Standards

Students explain natural phenomena with models. They rely on their scientific knowledge to define problems, and to develop solutions to those problems by applying their STEM knowledge and skills.

Light and Sound

Students investigate the properties of light and sound, including vibration from sound waves and the effect of different materials on the path of a beam of light. After students develop an understanding of light and sound, they are challenged to solve a design problem Mylo, Suzi, and Angelina face. In the story, the characters are lost and must use only the materials in their backpack to communicate over a distance by using light and/or sound. Students use the design process to sketch, build, test, and reflect on a device that solves this design problem.

Light: Observing the Sun, Moon, and Stars

After observing the sun, moon, and stars, students identify and describe patterns in their recorded data. Angelina, Mylo, and Suzi introduce the design problem, which challenges students to create a playground structure designed to protect students from ultraviolet radiation. Students utilize their knowledge of light to design, build, and test structures created to solve this problem. Students then evaluate their designs, share their findings, and explore ideas to improve their structures based on the testing data.

Animal Adaptations

Students explore animal adaptations for protection, camouflage, food obtainment, and locomotion. Students learn what it means for an organism to be adapted to its environment and how different adaptations can be categorized. Students are introduced to the design challenge when Suzi announces she is visiting the Sahara and needs to get prepared for her trip. Students are challenged to design the ideal shoe for travelers to wear in extreme environments, applying what they have learned and looking to plant and animal adaptations to guide their designs.

Animated Storytelling

In this module, students explore the sequential nature of computer programs through hands-on activities, both with and without a digital device. They explore the basic fundamentals of programming using ScratchJr, a block-based programming language to create their own projects. The Use-Modify-Create framework strengthens programming skills as students use a practice program, modify the program, and then create their own program according to the constraints provided.

Applying skills and knowledge learned from the activities and project in this module, students work together to design and program a digital animated story to share with members of their community.

Designs Inspired by Nature

Students investigate how offspring are like their parents. They model animals' patterns of behavior which help them survive. They learn how plants and animals have external parts that help them meet their needs. With this understanding, students follow the design process to build a model of an outdoor shelter that is inspired by plant and animal external parts.

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Aligned to Second Grade Standards

Students look for the mechanisms that drive phenomena by considering cause and effect, including designing digital scenarios in which an action has a result. They explore how systems change over long timescales.

Materials Science: Properties of Matter

In this module, students investigate and classify different kinds of materials by their observable properties, including color and texture, and heat conduction. Students learn about states of matter and properties of materials. They investigate which materials are good insulators and which are good conductors. After building their knowledge and skills throughout the module, students determine the best materials to use as they design a prototype to keep an ice pop frozen for at least 30 minutes.

Materials Science: Form and Function

Students research the variety of ways animals disperse seeds and pollinate plants. They expand their understanding of properties of matter as they consider the form and function involved in seed dispersal and pollination. Students are introduced to the design problem when Angelina, Mylo, and Suzi are tasked with starting a wildflower garden on an expansive plot outside of their school. To solve the design problem, students apply their knowledge and skills to design, build, test, and reflect on a device that mimics a way in which animals disperse seeds or pollinate plants.

Grids and Games

In this module, students explore the sequential nature of computer programs through hands-on activities, both with and without a digital device. In a life-size board game, students write a program using directional cards and repeat loops to program Rosie the Robotic Dog to move through a maze. Then, students develop an understanding of computer science, computer scientists, and the impacts of computing.

After building an understanding of computer science, students create programs using a block-based programming language. Students follow the Use-Modify-Create Framework to write programs with sequences, loops, and triggers. Applying skills and knowledge learned from the activities and project, students work together to design and program a game that can be played on a digital device.

The Changing Earth

Students explore how the surface of the Earth is always changing. They are introduced to different types of maps and explore how these maps convey different information about the world in which we live, including where water is found on Earth. Angelina, Mylo, and Suzi introduce the design problem when faced with the challenge of helping a community threatened by a potential landslide. Students investigate the different forces that shape the surface of the Earth and design solutions to limit the impact of erosion on this fictional community, which is located at the bottom of a hill that was recently destabilized by a fire.

Living Things: Diversity of Life

Students learn about the diversity of life in habitats, or biodiversity. They observe different habitats and the living things that grow in them. They engage in three scenarios to learn the importance of having many different organisms in a habitat. Next, students investigate how much water and sunlight plants need to grow in an environment. They use the design process to design a planter garden to grow in a specific environment.

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Aligned to Third Grade Standards

Students create models and make improvements through an iterative process. They design solutions that require them to move beyond their immediate surroundings, and make connections between local and global events.

Stability and Motion: Science of Flight

In this module, students learn about the forces involved in flight as well as Newton's Laws of Motion. They design, build, and test an experimental model glider to find out how air and other forces affect its flight. Students discover aeronautics alongside Angelina, Mylo, and Suzi and are inspired by the characters' desire to use their skills to help those in need. Students apply the design process to the problem of delivering aid to an area where supplies must be airlifted in and dropped to the ground from an aircraft.

Stability and Motion: Forces and Interactions

Students explore simple machines such as wheel and axles, levers, the inclined plane, and more. They investigate the effects of balanced and unbalanced forces on the motion of an object. Angelina, Mylo, and Suzi go on a field trip to the zoo and are faced with the design problem of how to rescue a trapped tiger. Students then apply their knowledge of forces and devise a way to rescue a heavy zoo animal while keeping it safe throughout the process.

Variation of Traits

A litter of puppies intrigues Angelina, Mylo, and Suzi because the color of some of the puppies is different than their parents. They explore the phenomena that offspring may express different traits than parents as they learn about dominant and recessive alleles. Students investigate inherited traits and multifactorial traits. Students discover that variation of traits may provide advantages among individuals of the same species. Using the design process, students design the offspring of two fictional parent animals that are able to survive in a specific environment. They use data to support the inherited traits passed from the parents to the offspring.

Programming Patterns

Students explore control structures such as events, loops, and conditionals. These structures specify the sequence in which instructions are executed within a program. Starting with computer-free activities and progressing to programming in a block-based language on a device, students learn how to think computationally about a program. In the design problem, Angelina, Mylo, and Suzi are challenged to use computer programming to write a story with different endings. Combining their writing and programming skills, students develop interactive stories on a device with multiple plots.

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Weather: Factors and Hazards

Angelina, Mylo, and Suzi wonder about a flood threatening to destroy the garden of Suzi's grandmother. They classify data related to three factors that affect weather: precipitation, temperature, and wind. They compare and contrast weather and climate, using the three factors in their descriptions. Students evaluate the role of materials in building structures that can withstand a weather hazard. They design a solution that reduces the impact of a weather-related hazard.

Life Cycles and Survival

The low yield of the community garden near Angelina, Mylo, and Suzi's school has them wondering about a cause. Students pick up the challenge by considering one possible factor: the decline of honeybees at the garden. They begin by learning about the similarities and differences of animal life cycles. They explore animals that live in groups and animals that live solitary lives. They learn that honeybees have an important relationship with flowering plants and that both life cycles are connected. Students also investigate the decline of honeybees due to environmental factors. Using the design process, they create a model of a habitat that promotes the survival of bees. Students create a public service announcement that shares their designs as a way to raise awareness about the importance of bees.

Environmental Changes

Angelina, Mylo, and Suzi take action to stop the effects of pollution on a local wetland habitat. This motivates students to explore different habitats and how they support life. They examine what fossils reveal about how organisms and habitats adapt and change over time. Students learn about environmental changes and simulate the effect they have on living things. Then, they take a deeper look at specific examples of environmental changes in their own habitat. Students use the design process to explore one problem caused by environmental change and develop an action plan to reduce or stop future damage.

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Aligned to Fourth Grade Standards

Students abstract ideas and generalize concepts from specific examples. They develop an enduring sense of accomplishment by addressing human wants and needs with independence through an engineering design process.

Input/Output: Computer Systems

Students become computer scientists as they explore how computing systems process input to produce output. They apply their understanding of computing systems as they compare them to human body systems. Students learn how to use technology while maintaining digital privacy and engaging in positive, safe, and legal behavior. Then, they use the knowledge and skills they have gained as they create programs using a block-based coding language. In the design problem, students participate in a class hackathon to design a game using inputs and outputs for children to play on a digital device."

Input/Output: Human Brain

Students discover how signals passing from cell to cell allow us to receive stimuli from the outside world, transmit this information to the brain for processing, and then send out a signal to generate a response. When Mylo experiences a concussion after falling off a skateboard while not wearing a helmet, he and his friends are motivated to raise awareness about concussions. Inspired by this design problem, students work as part of a team to design, plan, and create a video or podcast to educate children on identifying and preventing concussions.

Waves and Properties of Light

Students observe the amplitude and wavelength of waves in a simulation, and describe their patterns. They learn that waves move energy from one place to another, which can cause objects to move. They learn that colors are determined by the wavelengths of light through an investigation using the primary colors of light. Then, students explore how light interacts with different materials that are transparent, translucent, and opaque. They use the design process to design a game that incorporates their knowledge and skills about light, gained throughout the module.

Organisms: Structure and Function

Students examine a wide range of organisms, exploring their unique internal and external structures to understand how they support each animal's survival, growth, behavior, and reproduction. Students' view of organism structures becomes more complex as they experience how individual structures combine into larger systems. They make decisions about the types of structures and systems a plant needs to survive. Then they work toward solving the problem raised in the introduction story: How can we create a prosthesis that will help an animal eat or move effectively again? Using the design process, students apply their knowledge to design, build, test, and refine a model prosthesis for an injured animal.

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Earth: Past, Present, and Future

Students explore natural features on Earth. They learn about different landforms and bodies of water. Students take a deeper look at the origins of landforms as they learn about tectonic plates and plate boundaries. They examine how landforms have changed over time due to weathering and erosion. Students investigate how mechanical and chemical weathering impacts the Earth, and they identify examples of weathering in their local area. Students use the design process to create a documentary that explains how one of Earth's landforms has been shaped over time.

Earth: Human Impact and Natural Disasters

Students explore the relationship between humans and the environment. They learn how to reduce the impacts of humans on the environment and use the design process to create an upcycled project. Students investigate natural disasters, specifically earthquakes, to determine their frequency, location, and the risk of harm to humans. They design emergency preparedness kits to demonstrate their understanding of the challenges that natural disasters pose. Students follow the design process to generate a plan to reduce the human impact on Earth or to lessen the impact of natural disasters on humans.

Energy Exploration

Students engage in explorations of energy-related phenomena. They make observations, pose questions, and make connections as they investigate energy transfers. Throughout the module, students explore connections to careers and to the necessity of energy in real-life as they visit multiple business owners through the Main Street interactive experience. To deepen their understanding of energy, students design an investigation to test what happens when marbles collide on a track. Each business owner presents a problem that needs to be solved. Students select a problem and use the design process to apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

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Aligned to Fifth Grade Standards

Students apply technology to help others, and magnify their potential impact through the use of robotics, computer modeling, and simulations. They make sense of data while seeking answers to their own questions.

Robotics and Automation

Students explore the ways robots are used in today's world and their impact on society and the environment. Students learn about a variety of robotic components as they build and test mobile robots that may be controlled remotely. Angelina, Mylo, and Suzi are tasked with designing a mobile robot that can remove hazardous materials from a disaster site. Students are then challenged to design, model, and test a mobile robot that solves this design problem.

Robotics and Automation: Challenge

Students expand their understanding of robotics as they explore mechanical design and computer programming. This module focuses on developing skills needed to build and program autonomous robots. Angelina, Mylo, and Suzi are tasked with designing an automatic-guided vehicle to deliver supplies to a specific area in a hospital without being remotely controlled by a person. Inspired by this design problem, students work with a group to apply their knowledge to design, build, test, and refine a mobile robot that meets a set of design constraints.

Infection: Detection

Students explore transmission of infection, agents of disease, and mechanisms the body uses to stay healthy. Through a simulation, they compare communicable and non-communicable diseases. In the design problem, Suzi comes down with a fever and sore throat, and her friends wonder how this illness might have spread across the school. Students tackle the design problem by examining evidence to deduce the agent of infection, the likely source of the outbreak, and the path of transmission through a school. They design and run an experiment related to limiting the spread of germs and apply results to propose appropriate prevention methods.

Infection: Modeling and Simulation

Students explore how computer models can simulate the spread of communicable diseases. They learn that scientists use computer models to test predictions and develop explanations about the spread of these diseases, without infecting real people. Students investigate parameters, such as washing hands and staying home, that prevent the spread of a communicable disease. They apply what they have learned as they create programs using a block-based coding language. In the design problem, students design a computer model that simulates the spread of a communicable disease."

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Matter: Properties and Reactions

Students learn about the three states of matter. They investigate mixtures of different materials that lead to new substances and conserve mass. Students design a test that demonstrates that an item has the required mechanical properties.

Ecosystems: Flow of Matter and Energy

Students learn about Earth's ecosystems and how energy flows from the Sun to plants, and from plants to animals. Students create a model to describe photosynthesis and explain how energy from the Sun is introduced into an ecosystem. Students use evidence to defend the claim that plants get the materials they need for growth mainly from air and water. Students learn how energy flows through an ecosystem and explore a simulation about how an ecosystem can become unbalanced. Finally, students use the design process to develop an action plan to protect an ecosystem that has become unbalanced due to human activity.

Patterns in the Universe

Students develop an understanding that stars are balls of hot gas. They learn that our Sun is a star at the center of our planetary system. Students learn about predictable patterns on Earth in relation to its place in the solar system. They design an exhibit that educates others about a concept they have learned throughout the module.

Earth's Water and Interconnected Systems

Students learn about Earth's systems: the atmosphere, hydrosphere, geosphere, and biosphere. Students examine how these systems interact and examine the role of gravity within each system. They take an in-depth look at how the processes of the water cycle intersect with each of the systems and apply this knowledge to investigate factors that impact the rate of evaporation. Students use the design process to develop a method for producing clean drinking water from samples of contaminated water.