XYZprinting K-12 STEAM

a total 3D printing solution

STEAM Education 3D Printing Solution

XYZprinting K-12 STEAM is a 3D printing technology-based curriculum, designed to help you and your students learn the STEAM K-12 principles and prepare for the future.

XYZprinting provides a complete action-ready solution for every classroom environment. Our online curriculum will show you step-by-step how to deliver an engaging STEAM-based lesson, using child-centric 3D software and 3D printers along the way. We've got everything for you to expand your children's horizons and foster innovation today.

Why XYZprinting K-12 STEAM?

Custom kits for different classes

XYZprinting's classroom kits offer a great selection of tools for every classroom environment. Whether you are buying for one classroom or creating your own school's makerlab, we've got your options covered.

Great tools make great work

Our product suite has been designed to enable students to quickly prototype ideas. With beginner friendly modelling software such as XYZmaker, create a model quickly and send it through to one of our 3D printers to print in no time at all.

Innovative curriculum

Follow our new STEAM based curriculum and teach your children to be innovators. Our curriculum has been tailor-made to fit into a classroom environment and easily work with our printers and software.

XYZprinting K-12 STEAM curriculum features

K-12 STEAM's curriculum is a collection of paid lessons, created by like-minded professionals that can be downloaded and used right-away in the classroom.

3D design principles

The curriculum has an emphasis on teaching 3D design principles and encourages collaborative learning and problem solving skills.

NGSS based

Created with Next Generation Science Standards (NGSS) in mind, these lessons can easily be mixed with existing school curriculum or work as stand-alone units.

What is NGSS?
https://www.nextgenscience.org/

Classroom-ready lesson plan

Start teaching 3D design principles quickly with all the background research done for you.

Education kits

- Physical science
- Life science
- Engineering, Technology, & the Application of Science
- Earth and space science

High school (G9-12)

Quantity	1 st yr subscription	annual renew	each per year
13	$ 5,000	$ 2,500	$ 500

- Electrons and chemical bonds
- Circuit board housing
- Solar cell
- Mini Camera module
- Shock absorber
- Rube Goldberg Machines
- Gears
- Flashlight Design
- Buoyancy Design
- Design project: Tolerance analysis
- Bridges
- Pollution, Microplastics
- Structure of DNA

Middle school (G6-8)

Quantity	1 st yr subscription	annual renew	each per year
17	$ 3,000	$ 1,500	$ 250

- Atoms and molecular composition of compounds
- Solar Cooker
- Electromagnets
- Demolition Ball
- Mini windmill
- Roller coaster track
- Sprinings
- Laser lights plates
- Tool design: Wrench (Part 1)
- Tool design: Wrench (Part 2)
- Tool design: Wrench (Part 3)
- Tool design: Wrench (Part 4)
- Mini telescope
- The Object Holder
- Sensory System
- Cells
- Earth, Moon & Sun Systems

K-5

Quantity	1 st yr subscription	annual renew	each per year
10	$ 1,500	$ 750	$ 250

- Seesaw
- Mountain marathon
- The beauty of symmetry
- Gear
- Racing car
- Proportions and art
- Geometric
- Clock
- Elementary arithmetic
- Solar system

How do I get a kit?

Send your

- *Name*
- *Title*
- *Grade Level*
- *School Name*
- *Phone no.*
- *Email*
- *State*
- *Country*

to **education-us@xyzprinting.com**

us.xyzprinting.com

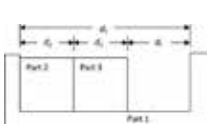
www.facebook.com/XYZprinting

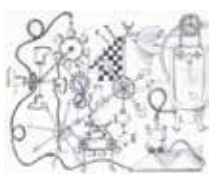
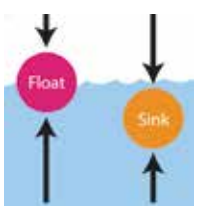
twitter.com/XYZprinting

www.instagram.com/xyzprinting

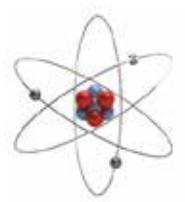
Appendix 1: XYZ STEAM curriculum syllabus (High school (G9-12))

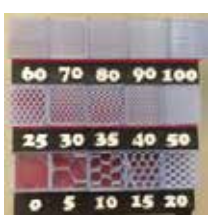
	Subject	Domain	Description	Standards
Curriculum 1 	**Electrons and chemical bonds**	**Physical Science**	Create models of atoms with proper electrons, along with designing models of the types of chemical bonds that exist between molecules. The visual design method will help students to better understand the concept and allow them to create physical representations of the molecular structure.	**HS-PS1-2**: Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.
Curriculum 2 	**Circuit board housing**	**Physical Science**	In these lessons, students will learn about how data is transferred both through analog and digital signals. They will discuss the advantages of both types of transmissions and learn that digital data transmission allows for information to be transferred securely and reliably. Students will also learn about Raspberry Pi, a tiny computer that is used to introduce students to computation and programming. The culminating project in these lessons is a design project where students are asked to 3D model and print a case that will house the latest version of Raspberry Pi.	**HS-PS4-2**: Evaluate questions about the advantages of using a digital transmission and storage of information.
Curriculum 3 	**Structure of DNA**	**Life Science**	DNA, deoxyribonucleic acid, is often referred to as the "blueprint" of life. For all living organisms, DNA contains the instructions for genes, necessary information for making proteins that regulate cell function. The helical structure of DNA (nucleic acid backbone) was discovered by scientists James Watson and Francis Crick in the 1950s after piecing together information from other scientists such as Friedrich Miescher, Rosalind Franklin, and Maurice Wilkins. In these lessons, students will learn about the research that led Watson & Crick to their discovery, along with understand how base pairing in DNA occurs. Students will then use their understanding of the DNA helix model and create a three dimensional version of DNA using CAD.	**HS-LS1-1**: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.
Curriculum 4 	**Pollution, Microplastics**	**Life Science**	In this lesson, students will learn about the Great Pacific Garbage Patch and do research on how plastics, specifically microplastics, have damaging effects on filter feeders such as zooplankton and oysters. Students will learn about microplastics and how they are used in abundance in innocuous everyday items such as toothpaste and facial cleansers. They will then design a sifter than can be used to remove microplastics from ocean sand.	**HS-LS4-6**: Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

	Subject	Domain	Description	Standards
Curriculum 5 	**Bridges**	**Engineering, Technology, & the Application of Science**	Bridge building and design is among the quintessential projects for engineering related courses. Too often, students are asked to create a bridge using toothpicks or uncooked spaghetti noodles. In these lessons, students will evaluate the various types of bridge designs and outline the typical uses for each. Students shall explain the how trusses, beams, and loads are integrated into the bridge designs. Students will create a small scale bridge design using the information they have acquired about the design parameters. Each piece or structure can be designed/3D Printed separately and assembled with glue or designed as a solid structure*.	**HS-ETS1-3**: Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts.
Curriculum 6 	**Design project: Tolerance analysis**	**Engineering, Technology, & the Application of Science**	Building interconnecting and mating parts correctly requires knowledge of the prototyping/production process as well as having an understanding the tolerances of the parts being designed and produced. With the use of the Engineering Design Process, students will design, prototype, and test 3D designs of puzzle cube pieces. Students will conduct FEA or other visual studies on the model as needed to validate such tolerance tests.	**HS-ETS1-4**: Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
Curriculum 7 	**Solar cell**	**Physical Science**	Reviewing the applications of solar technology and its applications, students will utilize off the shelf solar cells to capture sunlight that can provide DC power to a motor, LED, or other power receiving device. Design will focus on creating a solar cell frame that can be rotated/tilted to efficiently capture the sunlight at any given angle. Project will be related to Photovoltaic power production.	**HS-PS4-5**: Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.
Curriculum 8 	**Mini Camera module**	**Physical Science**	In this project, students will utilize a board camera to integrate with a custom hand held housing to build a functional digital custom camera. Designs can be created for specific experiments, projects, or adapted to robotic systems for full integration. Digital files will be stored on external SD Card.	**HS-PS4-2**: Evaluate questions about the advantages of using a digital transmission and storage of information.

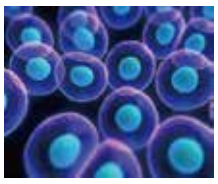
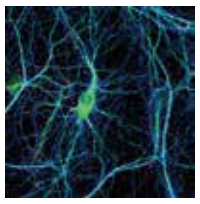
	Subject	Domain	Description	Standards
Curriculum 9				
	**Shock absorber**	**Physical Science**	Determine how forces are acted and reacted upon during contact or collision. Students will learn about action/reaction and methods to minimize the impact. Using a shock absorber design, studies will be done to create effective designs and testing of prototypes to determine the affects of each type of solution.	**HS-PS2-3**. Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.
Curriculum 10				
	**Rube Goldberg Machines**	**Physical Science**	Rube Goldberg machines are composed of different simple machines, tools that help us to do work. In physics, work is defined as a force acting on an object to move it across a distance. In these lessons, students will learn about the different categories of energy, along with the different types of simple machines. They will be asked to design and create their own complex machine.	**HS-PS3-3.** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
Curriculum 11				
	**Gears**	**Physical Science**	In these lessons, students will learn about different types of gears and their uses. Students will learn what dictates the direction of a gear system, how to calculate gear ratios, and how gears convert potential energy (e.g., elastic and gravitational) to kinetic energy in gear systems. Students will also 3D model and print a gear system.	**HS-PS3-3.** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
Curriculum 12				
	**Flashlight Design**	**Physical Science**	In this lesson students will learn about how 3D printing can be used to create precision objects that are both functional and useful. Students will learn about how current flows through a circuit and how symbols (i.e., circuit diagrams) can be used to explain different types of circuit configurations. Students will use their understanding of circuit diagrams to design their own circuit that will be used to create a flashlight design that utilizes off the shelf components such as LED, battery, battery holder, wiring, battery contacts, etc. These components will be integrated into a custom housing that the students design. Each design must integrate these components and fit with precision in order to make the parts function correctly.	**HS-PS2-6.** Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. **HS-PS3-3.** Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
Curriculum 13				
	**Buoyancy Design**	**Engineering, Technology, & the Application of Science**	Students will create a simple boat hull design and understand basic principles of buoyancy, floating/sinking, displacement, density, volume, mass, and area. They will use these principles to design a boat hull that can float using different types of materials.	**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.

Appendix 2: XYZ STEAM curriculum syllabus (Middle school (G6-8))

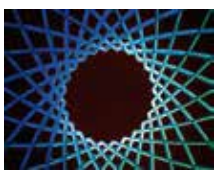
	Subject	Domain	Description	Standards
Curriculum 1 	**Atoms and molecular composition of compounds**	**Physical Science**	An understanding of the relationship between elements, compounds and molecules is essential to understanding how matter is composed. In this lesson, students will learn about the different types of matter and how elements and compounds make up all matter. Using their knowledge of these elements and compounds, students will build simple molecules. This visual representation of atomic composition will enable students to better understand common elements and compounds that make up most of what we are made up of.	**MS-PS1-1**: Develop models to describe the atomic composition of simple molecules and extendedstructures. **MS-PS1-4** : Develop a model to predict and/or describe phenomena.
Curriculum 2 	**Mini telescope**	**Engineering, Technology, & the Application of Science**	In these lessons, students will learn about the components of a basic Galilean telescope. They will learn about how telescopes collect light and magnify the image that the viewer is pointing at. Students will also learn about convex and concave lenses and how light behaves when it passes through them. The Design A Telescope project will allow students to 3D model and print their own version of a mini-telescope.	**MS-ETS1-2**. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
Curriculum 3 	**Solar Cooker**	**Physical Science**	Create an insulated box, a solar cooker, OR Styrofoam cup and test different types of filaments to see if material properties minimize or maximize thermal energy transfer.	**MS PS3-3:** Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. **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.
Curriculum 4 	**Earth, Moon & Sun Systems**	**Earth and Space Science**	In these lessons, students will learn about the Sun, Moon and Earth's patterns of motion. Through research, students will understand that the model of our solar system came from observations of motion and eclipses. Students will learn about the phases of a lunar eclipse, how seasons occur and use the concept of scale and proportion to explain the distance between these objects. Students will also create a model of the Earth-sun-moon system to help explain the patterns seen in observations of the system.	**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.
Curriculum 5 	**Tool design: Wrench (Part 1)**	**Engineering, Technology, & the Application of Science**	Create set of various wrench designs that utilize 3D modeling and mathematical solutions such as geometry and trigonometry concepts. Students will learn about various math concepts as well as torque and other engineering principles.	**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.

	Subject	Domain	Description	Standards
Curriculum 6 	**Tool design: Wrench (Part 2)**	**Engineering, Technology, & the Application of Science**	Students will evaluate the various types of wrench designs in order to determine the applications and usage for each type of shape (hex bolt head vs. triangular screw head, etc.) Geometrical shapes will be an important factor in their understanding of how each design is created and the mechanical properties each design creates.	**MS-ETS1-2**: Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.
Curriculum 7 	**Tool design: Wrench (Part 3)**	**Engineering, Technology, & the Application of Science**	In this section, the previous designs will be analyzed to determine the effectiveness of each design/shape and outline the properties of each design such as cost to manufacture, mechanical properties, torque, leverage, etc.	**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.
Curriculum 8 	**Tool design: Wrench (Part 4)**	**Engineering, Technology, & the Application of Science**	Create set of various wrench designs that utilize 3D modeling and mathematical solutions such as geometry and trigonometry concepts.	**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.
Curriculum 9 	**Electromagnets**	**Physical Science**	Maglev trains travel at top speeds in the absence of a driver. The powered guideways that the trains rest on determine where the trains travel. In these lessons, students will experiment with electromagnets to see what effects adding electricity to a magnet produces. In the design section of the lesson, students will build a housing for a simple electric motor that they will create.	**MS-PS2-3**: Ask questions about data to determine the factors that affect the strength of electric and magnetic forces
Curriculum 10 	**Demolition Ball**	**Physical Science**	Kinetic energy can be found in engineering and building construction industries. Students will learn about how kinetic energy is utilized with speed and mass. In this project, the students will design two varying sized spheres that represent a wrecking ball and conduct testing to analyze which design is most effective.	**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.

	Subject	Domain	Description	Standards
Curriculum 11 	**Mini windmill**	**Physical Science**	The American Wind Energy Association reports that in the last 10 years, $143 billion dollars have been invested in new wind projects as part of the United States wind industry. In 2016, they estimate that 24 million average American homes can be powered by the nation's current installed wind capacity (Wind Energy Facts at a Glance). In this lesson students will do research on wind capacity in their own communities and state. They will also do research on variables that affect wind turbine blade design so that they can 3D model and test their own wind turbines.	**MS-PS1-1** : Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success. **MS-PS1-4** : 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.
Curriculum 12 	**Roller coaster track**	**Physical Science**	An apple falling on Isaac Newton's head has been said to have given him the idea of gravity as a force. Motion and the forces that cause an object's motion have long been a topic of research for physicists and scientists alike. In these lessons, students will learn the difference between potential and kinetic energy by designing a roller coaster track from foam pipe insulation. They will hypothesize how different designs and heights contribute to greater potential energy, thus leading to higher kinetic energy. Students will also be introduced to the equation used to calculate potential energy and will be able to identify variables, along with make predictions regarding the relationships between those variables.	**MS-PS3-2**: Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system. **MS-PS3-5**: 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.
Curriculum 13 	**Sprinings**	**Physical Science**	Transfer of energy in springs is a common element in various products made today. Using a mechanism to create or transfer energy using a compression or extension spring will allow students to creatively think about how this mechanism could be integrated into various applications. Different design challenges can be presented to them for use in developing their design. Applications such as a pin ball machine plunger will be illustrated for reference and provide them with a range of design options.	**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. **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.
Curriculum 14 	**Laser lights plates**	**Physical Science**	In these lessons, students will learn about the difference between electromagnetic and magnetic waves. They will also learn about basic wave properties and what happens to light when it shines on different materials. Students will use their understanding of wave properties, along with their prior knowledge to create a device that will help them test predictions about how light will behave.	**MS-PS4-2**: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

	Subject	Domain	Description	Standards
Curriculum 15 	**Cells**	**Life science**	In these lessons students will learn about different types of cells, mainly plant and animal. Using online simulations, students will learn about the function of, and be able to identify, different organelles in the cell. Students will also learn about the scientists that contributed to our understanding of cell theory and view cell samples under a microscope. Students will then 3D model a plant or animal cell, along with specific organelles.	**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.
Curriculum 16 	**Sensory System**	**Life science**	Students will model simplified axons and dendrites to understand how receptors respond to stimuli. Students will also learn about how degenerative diseases such as multiple sclerosis results in a disruption of the flow of information in nerve cells by modeling that type of nerve cell.	**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.
Curriculum 17 	**The Object Holder**	**Engineering, Technology, & the Application of Science**	Students will design a smart phone or tablet holder to meet specific requirements provided to them. These parts will be designed to adapt to these devices to fit a specific application that will aide in their experiment design, learning environment, or as a tool that will help with conducting experiments such as data collection, visual inspection, etc.	**MS-ETS1-2**. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **MS-ETS1-4.** 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. The performance expectations above were developed using the following.

Appendix 3: XYZ STEAM project syllabus (K-5)

	Subject	Domain	Description	Standards
Curriculum 1				
	**Elementary arithmetic**	**Life Science**	Addition, subtraction, multiplication, division and the most basic operations of arithmetic. There are two important rules among all; Multiplication and division must be completed before addition and subtraction; expressions in parenthesis must be calculated first.	**2-LS4** Biological Evolution: unity and diversity **2-LS4-1** Make observations of plants and animals to compare the diversity of life in different habitats.
Curriculum 2				
	**Clock**	**Engineering, Technology, & the Application of Science**	The clock is one of the earliest inventions in human history. From tracking the changes in season to managing a daily routine, or even measurement in science. In this lesson students will be encouraged to design their own clocks and use them to calculate time equations.	**K-2-ETS1** 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.
Curriculum 3				
	**Proportions and art**	**Engineering, Technology, & the Application of Science**	Students will create in paper a tangram and take this concept and replicate it in 3D to learn about the spatial relationships objects have between one another without using a formula. Finally students will be asked to trace their tangram creations and color them in. By merging art skills, collaboration, and mathematics, students will gain a deeper understanding of the geometrical principles seen in everyday life.	**K-2-ETS1** 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. **K-2-ETS1-2** Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object to help it function as needed to solve a given problem
Curriculum 4				
	**The beauty of symmetry**	**Physical Science**	Students will learn about art and geometrical symmetry by creating spirograph drawings in three different generation methods: computer, 3D printing and drawing with you body and hands. By using these three techniques, children will learn about rotational and mirror symmetry.	**3-PS2** Motion and Stability: Forces and Interactions **3-PS2-1** Plan and conduct investigation to provide evidence of the effects of the balanced and unbalanced forces on the motion of an object. **3-PS2-2** Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.
Curriculum 5				
	**Racing car**	**Engineering, Technology, & the Application of Science**	In this lesson students will plan and design a concept car and use it to deepen their understanding of how gears work in mechanical devices.	**3-5-ETS1** 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. **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.

	Subject	Domain	Description	Standards
Curriculum 6				
	**Solar system**	**Earth and Space Science**	Our Solar System consists of a star we call the sun, and the planetary systems that orbit it. In this lesson students will learn about this solar system and the distances between planets by assembling a solar system model.	**5-PS2** Motion and Stability：Forces and Interactions **5-PS2-1** Support an argument that the gravitational force exerted by Earth on objects is directed down. **5-ESS1** Earth's Place in the Universe **5-ESS1-1** Support an argument that the apparent brightness of the sun and stars is due to their relative distances from the Earth.
Curriculum 7				
	**Gear**	**Engineering, Technology, & the Application of Science**	In our daily life, the use of machines make life easier. The bicycle is an example of a machine, which uses gears to speed up the way we travel. In this lesson, students will learn how gears work in mechanical devices and how they create a mechanical advantage by designing and creating their own 3D printable gear set.	**3-5-ETS1** Engineering Design **3-5-ETS1-2** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. **3-5-ETS1-2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
Curriculum 8				
	**Geometric**	**Engineering, Technology, & the Application of Science**	Geometry is one of the foundations of science that enable people, using purely intellectual processes, to make predictions about physical world. This lesson will help students to explore and create platonic solids.	**3-5-ETS1** Engineering Design **3-5-ETS1-1** Define a simple design problem reflecting a need or a want that includes specified for success and constraints on materials, time, or cost. **3-5-ETS1-2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem
Curriculum 9				
	**Seesaw**	**Physical Science**	A lever is a type of mechanism that contains a beam and a fixed fulcrum. In this lesson, students will learn how to describe measurable objects, such as weight and length, and plan a concept model and rapidly prototype a lever using 3D modeling software and 3D printers.	**3-PS2** 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.

Curriculum 10

Subject	Domain	Description	Standards
Mountain marathon	**Physical Science**	Students will be issued a challenge to create an extremely long penny drop. Using several physical constraints students will learn the practical applications of the Pythagorean formula and design and 3D print a maze to compete against other student groups.	**3-PS2** Motion and Stability: Forces and Interactions **3-PS2-1** Plan and conduct an investigation to provide evidence of the effects balanced and unbalanced forces on the motion of an object. **3-PS2-2** make an observation and/or measurement of an object's motion to provide evidence that a pattern can be used to predict future motion. **3-PS2-4** Define a simple design problem that can be solved be applying scientific ideas about magnets. **4-PS3** Energy **4-PS3-1** Use evidence to construct an explanation relating the speed of an object to the energy of that object.