Kingsway Regional School District

Committed to Excellence

Course Name: Architectural Design	**Grade Level(s):** 7
Department: Math	**Credits:** NA
BOE Adoption Date: October 2016	**Revision Date(s): October 2017; October 2018; October 2021**

ABSTRACT

This semester course introduces students to early hands-on engineering lessons. Students will study ancient architecture from the Egyptians and Romans as well as modern architecture. Students will study engineering disasters and their causes while applying their new found knowledge to plan and design buildings, bridges, urban areas, and space stations.

The course will incorporate concepts related to physics, math, and engineering. Students will need to conceptually understand mathematical concepts in order to be able to apply them to features related to buildings, bridges, transportation, and energy needs. Architectural Design is a course that transcends traditional subject matter. In education today, we are often program-heavy and systems-light. The Architectural Design curriculum is a catalyst for real change.

The course will be broken up into four major units, which include:

- History of Architecture
- Structural Engineering
- Urban Design
- Aerospace Engineering

Proficiencies and Pacing Guide:
Course Title: Architectural Design
Prerequisite(s): NA

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
Unit 1: History of Architecture	3 weeks Sept	**Mathematics:** NJ SLS.7.RP A.1, NJ SLS.7.RP.A.2.a, NJ SLS.7.NS A.3, NJ SLS.7.NS.B.3, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.8.G.B.6, NJ SLS.8.G.B.7, NJ SLS.8.G.B.8 **Science and engineering:** NJ SLS.MS-PS2-2, NJ SLS.MS-ETS1-3, NJ SLS.MS-ETS1-4, NJ SLS.HS-PS2-1 **Interdisciplinary:** NJ SLS.RST.6-8.1, NJ SLS.RST.6-8.3, NJ SLS.RST.6-8.7, NJ SLS.RST. 6-12.4, NJ SLS.RST.6-12.7 NJ SLS.WHST.6-8.1, NJ SLS.WHST.6-8.7 **Technology**: NJ SLS.8.2.8.ETW.2, NJ SLS.8.1.8.IC.1, NJ SLS.8.1.8.ED.3, NJ SLS.8.1.8.IC.3, NJ SLS.8.2.8.ETW.2, NJ SLS.8.2.8.ETW.2, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.HL-THR.4, NJ SLS.8.2.8.ED.5, NJ SLS.8.2.8.ED.3.a, NJ SLS.8.2.8.ED.7, NJ SLS.8.2.8.NT.3, NJ SLS.8.2.8.ED.6, NJ SLS.8.2.8.ED.2 **21st Century Life & Career Standards** NJ SLS.9.3.ST.1, NJ SLS.9.3.ST.2, NJ SLS.9.3.ST.3, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.ST-ET.2, NJ SLS.9.3.ST-ET.3, NJ SLS.9.3.ST-ET.4, NJ SLS.9.3.ST-ET.5, NJ SLS.9.3.ST-ET.6, NJ	• Students will be able to analyze proportional relationships and use them to solve real world and mathematical problems. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in different units as they read and create scale drawings (NJ SLS.7.RP A.1, 7.RP.A.2.a, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2)(2 weeks) • Students will be able to explain a proof of the Pythagorean Theorem and its converse as it pertains to the Egyptian pyramids and apply the Pythagorean Theorem to find unknown side lengths in a right triangle and the distance between two points. (NJ SLS.7.NS.A.3, NJ SLS.7.NS.B.3, NJ SLS.8.G.B.6, NJ SLS.8.G.B.7, NJ SLS.8.G.B.8) (1 week)	• Understand how and why early architecture starting with the pyramids of Egypt were designed and built • Understand where the Pythagorean Theorem came from and how it was used in early architecture • Apply the Pythagorean Theorem to identify right triangles • Apply the Pythagorean Theorem to find the unknown side of a right triangle • Apply the Pythagorean Theorem to find the distance between two points • Understand the basics of architecture • Design a single family home within a budget • Determine the dimensions and area of their home design

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		SLS.9.3.ST-SM.1, NJ SLS.9.3.ST-SM.2, NJ SLS.9.3.ST-SM.4 **Career Ready Practices:** CLKS.1, NSLS.CRP2, CRP4, CLKS.4, JSLS.CRP7, CLKS.5		
Unit 2: Structural Engineering	6 weeks Sept-Nov	**Mathematics:** NJ SLS.7.RP A.1, NJ SLS.7.NS A.3, NJ SLS.7.NS.B.3, NJ SLS.7.EE.B.3, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.7.G.B.4 **Science and engineering** NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2, NJ SLS.MS-ETS1-3 **Interdisciplinary:** NJ SLS.RST.6-8.1, NJ SLS.RST.6-8.3, NJ SLS.RST.6-8.7, NJ SLS.RST. 6-12.4, NJ SLS.RST.6-12.7 NJ SLS.WHST.6-8.1, NJ SLS.WHST.6-8.7 **Technology**: NJ SLS.8.2.8.ETW.2, NJ SLS.8.1.8.IC.1, NJ SLS.8.1.8.ED.3, NJ SLS.8.1.8.IC.3, NJ SLS.8.2.8.ETW.2, NJ SLS.8.2.8.ETW.2, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.HL-THR.4, NJ SLS.8.2.8.ED.5, NJ SLS.8.2.8.ED.3, NJ SLS.8.2.8.ED.7, NJ SLS.8.2.8.NT.3, NJ SLS.8.2.8.ED.6, NJ SLS.8.2.8.ED.2 **21st Century Life & Career Standards** NJ SLS.9.3.ST.1, NJ SLS.9.3.ST.2, NJ SLS.9.3.ST.3, NJ SLS.9.3.ST-ET.1, NJ	• Students will be able to analyze data from past engineering disasters 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 understand what contributed to the disaster and how to improve the design. (NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2, NJ SLS.MS-ETS1-3) (2 weeks) • Students will be able to design a skyscraper taking into account material cost and tensile strength along with the strength of geometric shapes. They will also evaluate competing design solutions to determine how well they meet the criteria and constraints of the problem. (NJ SLS.7.RP.A.1, NJ SLS.7.EE.B.3, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.7.G.B.4, NJ SLS.MS-ETS1-1) (2 weeks) • Students will be able to draw and construct bridges understanding the constraints of the design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on the natural environment that may limit possible solutions. (NJ SLS.7.RP.A.1,	• Understand the importance to detail. • Understand why engineering disasters happen. • Understand the effects of wind shear on a bridge. • Understand why the Twin Towers fell on 9/11. • Develop an understanding of tensile strength of different material. • Develop an understanding that different geometric shapes have different strengths. • Design a city skyline. • Plan and design a skyscraper. • Compare skyscraper designs. • Understand how skyscrapers differ depending on where it is built and why. • Design different types of bridges based on the location, height, and distance of the bridge. • Design and build a toothpick bridge. • Compare their bridges for strength.

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		SLS.9.3.ST-ET.2, NJ SLS.9.3.ST-ET.3, NJ SLS.9.3.ST-ET.4, NJ SLS.9.3.ST-ET.5, NJ SLS.9.3.ST-ET.6, NJ SLS.9.3.ST-SM.1, NJ SLS.9.3.ST-SM.2, NJ SLS.9.3.ST-SM.4 **Career Ready Practices:** CLKS.1, CRP2, CRP4, CLKS.4, CRP7, CLKS.5	NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.7.G.B.4, NJ SLS.MS-ETS1-1) (2 weeks)	
Unit 3: Urban Design	6 weeks Nov-Jan	**Mathematics:** NJ SLS.7.RP A.1, NJ SLS.7.NS A.3, NJ SLS. 7.NS.B.3, NJ SLS.7.G A.1, NJ SLS.7.G.A.2 **Science and engineering** NJ SLS.MS-ESS3-3, NJ SLS.MS-ESS3-4, NJ SLS. MS-ESS3-5, NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2 **Interdisciplinary:** NJ SLS.RST.6-8.1, NJ SLS.RST.6-8.3, NJ SLS.RST.6-8.7, NJ SLS.RST. 6-12.4, NJ SLS.RST.6-12.7 NJ SLS.WHST.6-8.1, NJ SLS.WHST.6-8.7 **Technology**: NJ SLS.8.2.8.ETW.2, NJ SLS.8.1.8.IC.1, NJ SLS.8.1.8.ED.3, NJ SLS.8.1.8.IC.3, NJ SLS.8.2.8.ETW.2, NJ SLS.8.2.8.ETW.2, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.HL-THR.4, NJ SLS.8.2.8.ED.5, NJ SLS.8.2.8.ED.3.a, NJ SLS.8.2.8.ED.7, NJ SLS.8.2.8.NT.3, NJ SLS.8.2.8.ED.6, NJ SLS.8.2.8.ED.2	• Students will be able to analyze different urban development plans comparing the similarities and differences taking into account relevant scientific principles and potential impacts on people and the natural environment that may have limited the urban designs. (NJ SLS.7.RP.A.1, NJ SLS.MS-ETS1-2) (1 week) • Students will be able to construct an argument supported by evidence of how human population and their consumption of natural resources affects Earth. Students will also be able to analyze factors that contribute to the cause of rise in global temperatures and apply scientific principles to design a way to minimize human impact on the environment. (7.NS.A.3, NJ SLS.7.NS.B.3, NJ SLS.MS-ESS3-3, NJ SLS.MS-ESS3-4, NJ SLS.MS-ESS3-5) (1 week) • Students will be able to define the criteria and constraints of an urban design, taking into account impacts on people and the natural environment that may limit possible designs. They will also	• Compare different urban design layouts • Understand the impact of land formations and the design of the urban area • Understand the importance of a transportation system • Understand the important role energy plays in daily life • Investigate alternative energy sources • Understand the importance for public space and landscaping in urban living • Design their own urban layout • Design/Construct their own urban design through SimCity challenge • Design/construct a tiny house

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		21st Century Life & Career Standards NJ SLS.9.3.ST.1, NJ SLS.9.3.ST.2, NJ SLS.9.3.ST.3, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.ST-ET.2, NJ SLS.9.3.ST-ET.3, NJ SLS.9.3.ST-ET.4, NJ SLS.9.3.ST-ET.5, NJ SLS.9.3.ST-ET.6, NJ SLS.9.3.ST-SM.1, NJ SLS.9.3.ST-SM.2, NJ SLS.9.3.ST-SM.4 **Career Ready Practices:** CLKS.1, CRP2, CRP4, CLKS.4, CRP7, CLKS.5	create a scale drawing an urban design that would meet their defined criteria and constraints. (NJ SLS.7.RP.A.1, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2) (2 weeks) • Students will be able to create and evaluate competing design solutions using SimCity results to determine how well they met the criteria and constraints of urban design. (NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.MS-ETS1-2) (2 weeks)	
Unit 4: Aerospace Engineering	3 weeks Jan-Feb	**Mathematics:** NJ SLS.7.RP A.1, NJ SLS.7.NS.B.3, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2 **Science and engineering** NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2 **Interdisciplinary:** NJ SLS.RST.6-8.1, NJ SLS.RST.6-8.3, NJ SLS.RST.6-8.7, NJ SLS.RST. 6-12.4, NJ SLS.RST.6-12.7 NJ SLS.WHST.6-8.1, NJ SLS.WHST.6-8.7 **Technology**: NJ SLS.8.2.8.ETW.2, NJ SLS.8.1.8.IC.1, NJ SLS.8.1.8.ED.3, NJ SLS.8.1.8.IC.3, NJ SLS.8.2.8.ETW.2, NJ SLS.8.2.8.ETW.2, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.HL-THR.4, NJ SLS.8.2.8.ED.5, NJ SLS.8.2.8.ED.3.a, NJ SLS.8.2.8.ED.7, NJ SLS. 8.2.8.NT.3, NJ SLS.8.2.8.ED.6, NJ	• Students will be able to analyze different planets comparing the similarities and differences to Earth taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit life on other planets. (NJ SLS.7.RP.A.1, NJ SLS.7.NS.B.3, NJ SLS.MS-ETS1-2)(1 week) • Students will be able to define the criteria and constraints of a space station design, taking into account impacts on people, and the natural environment that may limit possible designs. They will also create a scale drawing a space station that would meet their defined criteria and constraints. (7.RP.A.1, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2) (2 weeks)	• Understand the NASA technology used every day • Understand NASA's future plans for space travel • Compare urban design to a possible space station on the moon or Mars • Describe constraints on a possible space station • Understand the importance of a transportation hub for life in space • Compare an airport to a possible space station port • Plan and design a space station for the moon or Mars

Unit Title:	Duration/ Month(s)	Related Standards:	Learning Goals:	Topics and Skills:
		SLS. 8.2.8.ED.2 **21st Century Life & Career Standards** NJ SLS.9.3.ST.1, NJ SLS.9.3.ST.2, NJ SLS.9.3.ST.3, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.ST-ET.2, NJ SLS.9.3.ST-ET.3, NJ SLS.9.3.ST-ET.4, NJ SLS.9.3.ST-ET.5, NJ SLS.9.3.ST-ET.6, NJ SLS.9.3.ST-SM.1, NJ SLS.9.3.ST-SM.2, NJ SLS.9.3.ST-SM.4 **Career Ready Practices:** CLKS.1, CRP2, CRP4, NJLS.CLKS.4, CRP7, CLKS.5		

Unit: 1 History of Architecture	Recommended Duration: 3 Weeks– Sept
Unit Description: This unit takes a global look at the history of architecture, from the Egyptian civilization to the current day. It treats buildings and environments, including cities, in the context of the cultural and civilizational history. It offers an introduction to design principles and analysis.	

Essential Questions:	Enduring Understandings:
• How does ancient architecture influence modern architectural design? • What are the implications of not using a scale model or drawing when designing architecture?	• Understand architecture is the art of building something. • Understand architects design a building using scale drawings such as ¼ scale and mathematical concepts used.

Relevant Standards:	Learning Goals:	Learning Objectives:
Mathematics: **NJ SLS.7.RP A.1** Analyze proportional relationships and use them to solve real world and mathematical problems. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour. **NJ SLS.7.RP.A.2.a** Analyze proportional relationships and use them to solve real-world and mathematical problems. Recognize and represent proportional relationships between quantities. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. **NJ SLS.7.NS A.3** Apply and extend previous understandings of operations with fractions to add,	• Students will be able to analyze proportional relationships and use them to solve real world and mathematical problems. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in different units as they read and create scale drawings (NJ SLS.7.RP A.1, NJ SLS.7.RP.A.2.a, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2) (2 weeks) • Students will be able to explain a proof of the Pythagorean Theorem and its converse as it pertains to the Egyptian pyramids and apply the Pythagorean Theorem to find unknown side lengths in a right triangle and the distance between two points. (7.NS.A.3, NJ SLS.7.NS.B.3, NJ SLS.8.G.B.6, NJ SLS.8.G.B.7, NJ SLS.8.G.B.8) (1 week)	• Understand how and why early architecture starting with the pyramids of Egypt were designed and built • Understand where the Pythagorean Theorem came from and how it was used in early architecture • Apply the Pythagorean Theorem to identify right triangles • Apply the Pythagorean Theorem to find the unknown side of a right triangle • Apply the Pythagorean Theorem to find the distance between two points • Understand the basics of architecture • Design a single family home within a budget • Determine the dimensions and area of their home design

Relevant Standards:	Learning Goals:	Learning Objectives:
subtract, multiply, and divide rational numbers. Solve real-world and mathematical problems involving the four operations with rational numbers. **NJ SLS.7.NS.B.3** Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. **NJ SLS.7.G A.1** Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. **NJ SLS.7.G.A.2** Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides,		

Relevant Standards:	Learning Goals:	Learning Objectives:
noticing when the conditions determine a unique triangle, more than one triangle, or no triangle **NJ SLS.8.G.B.6** Explain a proof of the Pythagorean Theorem and its converse. **NJ SLS.8.G.B.7** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. **NJ SLS.8.G.B.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.		

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
Pre-Assessment , Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Popsicle Sticks, Thumbs Up/Thumbs Down, Stomp on Three, Student Progress Charts & Reflections	Unit test, Extended constructed response questions, Quizzes, Student logbook	¼ scale drawing of a home	**Major Assignments (required):** ¼ scale drawing of a home, Unit test, Extended constructed response questions, Quizzes, Student logbook **Major Activities (required):** ¼ scale drawing of a home

Instructional Strategies:
Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Examining Similarities and Differences, Examining Errors in Reasoning, Practicing Skills, Strategies and Processes, Engaging Students in Cognitively Complex Tasks Involving Hypothesis Generation and Testing

Possible Instructional Modifications /Accommodations:
Instructional Scaffolds, “Interleave”-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (such as measurement, units of measure, and properly reading a stopwatch and tape measure), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: Aqueduct, Amphitheatre, Theatre, arch, column, bathhouse, monument, pyramid, Pythagorean Theorem, right triangle, hypotenuse, addition, subtraction, square, square root **Non-Essential:** Colosseum, Doric, Ionic, Corinthian, Great Pyramid at Giza, Valley of the Kings, capital

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
E/LA: NJ SLS.RST.6-8.1 NJ SLS.RST.6-8.3 NJ SLS.RST.6-8.7 NJ SLS.RST. 6-12.4 NJ SLS.RST.6-12.7 NJ SLS.WHST.6-8.1 NJ SLS.WHST.6-8.7 Mathematics: NJ SLS.7.RP A.1, 7.RP.A.2.a NJ SLS.7.NS A.3 NJ SLS.7.NS.B.3 NJ SLS.7.G.A.1 NJ SLS.7.G.A.2 NJ SLS.8.G.B.6 NJ SLS.8.G.B.7 NJ SLS.8.G.B.8 Science: NJ SLS.MS-PS2-2 NJ SLS.MS-ETS1-3 NJ SLS.MS-ETS1-4 NJ SLS.HS-PS2-1 Technology: NJ SLS.8.2.8.ETW.2 NJ SLS.8.1.8.IC.1 NJ SLS.8.1.8.ED.3	Technology: Geometry Sketch PAD CAD	_x__ Financial, Economic, Business, & Entrepreneurial Literacy	__x_ Creativity & Innovation _x__ Critical Thinking and Problem Solving _x__ Life and Career Skills Technologies Literacy _x__ Communication & Collaboration

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
NJ SLS.8.1.8.IC.3 NJ SLS.8.2.8.ETW.2 NJ SLS.8.2.8.ETW.2 NJ SLS.9.3.ST-ET.1 NJ SLS.9.3.HL-THR.4 NJ SLS.8.2.8.ED.5 NJ SLS.8.2.8.ED.3.a NJ SLS.8.2.8.ED.7 NJ SLS.8.2.8.NT.3 NJ SLS.8.2.8.ED.6 NJ SLS.8.2.8.ED.2 Equity Integration (Using James Banks' Levels of Multicultural Integration): https://diversity.asee.org/deicommittee/2021/05/04/two-strategies-towards-socially-just-engineering-integration-in-high-school-science/ 21st Century Life and Careers: NJ SLS.9.3.ST.1 NJ SLS.9.3.ST.2 NJ SLS.9.3.ST.3 NJ SLS.9.3.ST-ET.1 NJ SLS.9.3.ST-ET.2 NJ SLS.9.3.ST-ET.3 NJ SLS.9.3.ST-ET.4 NJ SLS.9.3.ST-ET.5 NJ SLS.9.3.ST-ET.6 NJ SLS.9.3.ST-SM.1 NJ SLS.9.3.ST-SM.2 NJ SLS.9.3.ST-SM.4			

Resources:
Texts/Materials: websites, YouTube clips

Resources:

Unit: 2 Architectural Engineering	Recommended Duration: 6 Weeks– Sept- Nov
Unit Description: In unit two, students will study some of the engineering disasters that have plagued architects and engineers alike, from the leaning Tower of Pisa to the Tacoma Narrows Bridge "Galloping Gertie" and many more. Students will also develop an understanding of tensile strength of materials and geometric shapes. With this knowledge, students will design bridges and a skyscraper.	

Essential Questions:	Enduring Understandings:
• What are the primary causes of an engineering disaster? • How did the collapse of the Tacoma Narrows Bridge change how suspension bridges are made today? • What is tensile strength? • What geometric shapes are the strongest? • How did the collapse of the Twin Towers change skyscrapers today? • What forces do bridges and skyscrapers have to overcome?	• Understand there are a number of reasons including human error, design error, material failure, and extreme conditions on environment. • Understand that aerodynamics must be accounted for in more than automobiles. • Understand different materials can withstand different amounts of tension. • Understand geometric shapes have different strengths. • Understand that structures must overcome a number of forces.

Relevant Standards:	Learning Goals:	Learning Objectives:
Mathematics: **NJ SLS.7.RP.A.1** Analyze proportional relationships and use them to solve real-world and mathematical problems. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour. **NJ SLS.7.EE.B.3** Solve real-life and mathematical problems using numerical and algebraic expressions and equations. 3. Solve multi-step real-life and mathematical problems posed with	• Students will be able to analyze data from past engineering disasters 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 understand what contributed to the disaster and how to improve the design. (NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2, NJ SLS.MS-ETS1-3) (2 weeks)	• Understand the importance to detail • Understand why engineering disasters happen • Understand the effects of wind shear on a bridge • Understand why the Twin Towers fell on 9/11 • Develop an understanding of tensile strength of different material • Develop an understanding that different geometric shapes have

Relevant Standards:	Learning Goals:	Learning Objectives:
positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. **NJ SLS.7.G A.1** Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. **NJ SLS.7.G.A.2** Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle **NJ SLS.7.G.B.4** Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. 4. Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. **Science:** **NJ SLS.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.	• Students will be able to design a skyscraper taking into account material cost and tensile strength along with the strength of geometric shapes. They will also evaluate competing design solutions to determine how well they meet the criteria and constraints of the problem. (NJ SLS.7.RP.A.1, NJ SLS.7.EE.B.3, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.7.G.B.4, NJ SLS.MS-ETS1-1) (2 Weeks) • Students will be able to draw and construct bridges understanding the constraints of the design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on the natural environment that may limit possible solutions. (NJ SLS.7.RP.A.1, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.7.G.B.4, NJ SLS.MS-ETS1-1) (2 weeks)	different strengths • Design a city skyline • Plan and design a skyscraper • Compare skyscraper designs • Understand how skyscrapers differ depending on where it is built and why • Design different types of bridges based on the location, height, and distance of the bridge • Design and build a toothpick bridge • Compare their bridges for strength

Relevant Standards:	Learning Goals:	Learning Objectives:
NJ SLS.MS-ETS1-2 Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem. **NJ SLS.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.		

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
Pre-Assessment , Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Popsicle Sticks, Thumbs Up/Thumbs Down, Stomp on Three, Student Progress Charts & Reflections	Unit test, Extended constructed response questions, Quizzes, Student logbook, Team projects	Geometric shapes strength test, city skyline, skyscraper design, bridge designs, toothpick bridge	**Major Assignments (required):** Unit Test **Major Activities (required):** geometric shapes strength test, skyscraper design, toothpick bridge

Possible Assessment Modifications /Accommodations:
Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices

Instructional Strategies:
Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Examining Similarities and Differences, Examining Errors in Reasoning, Practicing Skills, Strategies and Processes, Engaging Students in Cognitively Complex Tasks Involving Hypothesis Generation and Testing

Possible Instructional Modifications /Accommodations:
Instructional Scaffolds, “Interleave”-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (such as measurement, units of measure, and properly reading a stopwatch and tape measure), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: Metric, Imperial, Cable-Stayed Bridge, Suspension Bridge, Cantilever Bridge, Arch Bridge, Beam Bridge, Truss Bridge**,** tensile strength **Non-Essential:**

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
E/LA: NJ SLS.RST.6-8.1, NJ SLS.RST.6-8.3, NJ SLS.RST.6-8.7, NJ SLS.RST. 6-12.4, NJ SLS.RST.6-12.7 NJ SLS.WHST.6-8.1, NJ SLS.WHST.6-8.7 Mathematics: NJ SLS.7.RP A.1, NJ SLS.7.NS A.3, NJ SLS.7.NS.B.3, NJ SLS.7.EE.B.3, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.7.G.B.4 Science: NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2, NJ SLS.MS-ETS1-3 Technology: NJ SLS.8.2.8.ETW.2, NJ SLS.8.1.8.IC.1, NJ SLS.8.1.8.ED.3, NJ SLS.8.1.8.IC.3, NJ SLS.8.2.8.ETW.2, NJ SLS.8.2.8.ETW.2, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.HL-THR.4, NJ SLS.8.2.8.ED.5, NJ SLS.8.2.8.ED.3.a, NJ SLS.8.2.8.ED.7, NJ SLS.8.2.8.NT.3, NJ SLS.8.2.8.ED.6, NJ SLS.8.2.8.ED.2 Equity Integration (Using James Banks' Levels of Multicultural Integration): https://diversity.asee.org/deicommittee/2021/05/04/two-strategies-towards-socially-just-engineering-integration-in-high-school-science/ 21st Century Life and Careers: NJ SLS.9.3.ST.1, NJ SLS.9.3.ST.2, NJ SLS.9.3.ST.3, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.ST-ET.2, NJ SLS.9.3.ST-ET.3, NJ SLS.9.3.ST-ET.4, NJ SLS.9.3.ST-ET.5, NJ SLS.9.3.ST-ET.6, NJ SLS.9.3.ST-SM.1, NJ SLS.9.3.ST-SM.2, NJ SLS.9.3.ST-SM.4	Technology: Geometry Sketch PAD CAD	____ Global Awareness ____ Civic Literacy _x__ Financial, Economic, Business, & Entrepreneurial Literacy ____ Health Literacy	_x__ Creativity & Innovation ____ Media Literacy _x__ Critical Thinking and Problem Solving _x__ Life and Career Skills ____ Information & Communication Technologies Literacy _x__ Communication & Collaboration ____ Information Literacy

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:

Resources:
Texts/Materials:

Unit: 3 Urban Living	Recommended Duration: 6 Weeks– November- January
Unit Description: In unit three, students will study urban living and city design. Students will understand the importance in the location of streets, transportation hubs, buildings, public space, and landscape. They will also understand the importance of energy and how to supply it to the city.	

Essential Questions:	Enduring Understandings:
• What does urban design consist of? • How important is transportation? • Why is it important to have public space and landscaping in urban design? • What are the pros and cons of each energy source? • Are there any alternatives for future energy consumption? • What are the basic energy sources?	• Understand designing an urban area consists of many aspects including buildings, streets, transportation hubs, energy sources, public space, and landscaping. • Understand there are many energy sources for urban development. • Understand the importance of implementing alternative energy sources.

Relevant Standards:	Learning Goals:	Learning Objectives:
Mathematics: **NJ SLS.7.RP A.1** Analyze proportional relationships and use them to solve real-world and mathematical problems. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour. **NJ SLS.7.NS A.3** Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide	• Students will be able to analyze different urban development plans comparing the similarities and differences taking into account relevant scientific principles and potential impacts on people and the natural environment that may have limited the urban designs. (NJ SLS.7.RP.A.1, NJ SLS.MS-ETS1-2) (1 week) • Students will be able to construct an	• Compare different urban design layouts • Understand the impact of land formations and the design of the urban area • Understand the importance of a transportation system • Understand the important role energy plays in daily life • Investigate alternative energy sources • Understand the importance for public

Relevant Standards:	Learning Goals:	Learning Objectives:
rational numbers. Solve real-world and mathematical problems involving the four operations with rational numbers. **NJ SLS.7.NS.B.3** Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. **NJ SLS.7.G A.1** Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. **NJ SLS.7.G.A.2** Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **Science:** **NJ SLS.MS-ESS3-3** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	argument supported by evidence of how human population and their consumption of natural resources impact Earth. Students will also be able to analyze factors which contribute to the cause of rise in global temperatures and apply scientific principles to design a way to minimize human impact on the environment. (NJ SLS.7.NS.A.3, NJ SLS.7.NS.B.3, NJ SLS.MS-ESS3-3, NJ SLS.MS-ESS3-4, NJ SLS.MS-ESS3-5) (1 week) • Students will be able to define the criteria and constraints of an urban design, taking into account impacts on people and the natural environment that may limit possible designs. They will also create a scale drawing an urban design which would meet their defined criteria and constraints. (NJ SLS.7.RP.A.1, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2)(2 weeks) • Students will be able to create and evaluate competing design solutions using SimCity results to determine how well they met the criteria and constraints of urban design. (NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.MS-ETS1-2) (2 weeks)	space and landscaping in urban living • Design their own urban layout • Design/Construct their own urban design through SimCity challenge

Relevant Standards:	Learning Goals:	Learning Objectives:
NJ SLS.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. **NJ SLS.MS-ESS3-5** Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century. **NJ SLS.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. **NJ SLS.MS-ETS1-2** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.		

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
Pre-Assessment , Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Popsicle Sticks, Thumbs Up/Thumbs Down, Stomp on Three, Student Progress Charts & Reflections	Unit test, Extended constructed response questions, Quizzes, Student logbook, Team projects	Design a neighborhood, energy of the future project, SimCity project	**Major Assignments (required):** Unit Test **Major Activities (required):** Design a neighborhood, SimCity project

Possible Assessment Modifications /Accommodations:
Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices

Instructional Strategies:
Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Examining Similarities and Differences, Examining Errors in Reasoning, Practicing Skills, Strategies and Processes, Engaging Students in Cognitively Complex Tasks Involving Hypothesis Generation and Testing

Possible Instructional Modifications /Accommodations:
Instructional Scaffolds, "Interleave"-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (such as measurement, units of measure, and properly reading a stopwatch and tape measure), Review and Re-teaching of Difficult Concepts

Unit Vocabulary:
Essential: Energy, Kinetic Energy, Potential Energy, Conservation of Energy, Energy Transfer, Gravitational Potential Energy, Chemical Energy, Mechanical Energy, Electrical Energy, renewable energy, solar energy, wind energy, hydroelectric energy **Non-Essential:** ?

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
E/LA: NJ SLS.RST.6-8.1, NJ SLS.RST.6-8.3, NJ SLS.RST.6-8.7, NJ SLS.RST. 6-12.4, NJ SLS.RST.6-12.7 NJ SLS.WHST.6-8.1, NJ SLS.WHST.6-8.7 Mathematics: NJ SLS.7.RP A.1, NJ SLS.7.NS A.3, NJ SLS.7.NS.B.3, NJ SLS.7.G A.1, NJ SLS.7.G.A.2 Science: NJ SLS.MS-ESS3-3, NJ SLS.MS-ESS3-4, NJ SLS.MS-ESS3-5, NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2 Equity Integration (Using James Banks' Levels of Multicultural Integration): https://diversity.asee.org/deicommittee/2021/05/04/two-strategies-towards-socially-just-engineering-integration-in-high-school-science/ Technology: NJ SLS.8.2.8.ETW.2, NJ SLS.8.1.8.IC.1, NJ SLS.8.1.8.ED.3, NJ	Technology: SIM City	____ Global Awareness ____ Civic Literacy _x__ Financial, Economic, Business, & Entrepreneurial Literacy ____ Health Literacy	_x__ Creativity & Innovation ____ Media Literacy __x_ Critical Thinking and Problem Solving _x__ Life and Career Skills ____ Information & Communication Technologies Literacy _x__ Communication & Collaboration

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
SLS.8.1.8.IC.3, NJ SLS.8.2.8.ETW.2, NJ SLS.8.2.8.ETW.2, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.HL-THR.4, NJ SLS.8.2.8.ED.5, NJ SLS.8.2.8.ED.3.a, NJ SLS.8.2.8.ED.7, NJ SLS.8.2.8.NT.3, NJ SLS.8.2.8.ED.6, NJ SLS.8.2.8.ED.2 21st Century Life and Careers: NJ SLS.9.3.ST.1, NJ SLS.9.3.ST.2, NJ SLS.9.3.ST.3, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.ST-ET.2, NJ SLS.9.3.ST-ET.3, NJ SLS.9.3.ST-ET.4, NJ SLS.9.3.ST-ET.5, NJ SLS.9.3.ST-ET.6, NJ SLS.9.3.ST-SM.1, NJ SLS.9.3.ST-SM.2, NJ SLS.9.3.ST-SM.4			____ Information Literacy

Resources:
Texts/Materials: internet, virtual reality glasses, SimCity

Unit: 4 Space Design	Recommended Duration: 3 Weeks– January-February
Unit Description: This unit takes a turn towards space as the students study the possibility of life in space. It offers an introduction NASA and its plans to build a space station on the moon and Mars. Students will investigate the dangers and problems that humans will have to overcome in order to make space life possible. Weighing the possible solutions and the drawbacks, students will plan and design their own space station.	

Essential Questions:	Enduring Understandings:
• What are NASA's plans for the future? • What problems does NASA face with building a space station? • How does the design of the space shuttle compare with the design of a skyscraper? • How would the design of a space station on another planet compare to an urban development design?	• Understand NASA's technology is used on Earth every single day. • Understand NASA is planning on sending humans to space. • Understand the obstacles facing life in space. • Understand the basic design of a spacecraft and its similarities to skyscrapers. • Understand the importance of a transportation hub, even with life in space.

Relevant Standards:	Learning Goals:	Learning Objectives:
Mathematics: **NJ SLS.7.RP A.1** Analyze proportional relationships and use them to solve real-world and mathematical problems. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks ½ mile in each ¼ hour, compute the unit rate as the complex fraction ½/1/4 miles per hour, equivalently 2 miles per hour. **NJ SLS.7.NS.B.3** Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 ¾ inches long in the center of a door that is 27 ½ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation. **NJ SLS.7.G A.1** Draw, construct, and describe geometrical figures and describe the relationships between them. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. **NJ SLS.7.G.A.2** Draw (with technology, with ruler and protractor, as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle	Students will be able to analyze different planets comparing the similarities and differences to Earth taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit life on other planets. (NJ SLS.7.RP.A.1, NJ SLS.7.NS.B.3, NJ SLS.MS-ETS1-2) Students will be able to define the criteria and constraints of a space station design, taking into account impacts on people, and the natural environment that may limit possible designs. They will also create a scale drawing a space station which would meet their defined criteria and constraints. (NJ SLS.7.RP.A.1, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2, NJ SLS.MS-ETS1-1, NJ SLS.MS-ETS1-2)	• Understand the NASA technology used every day • Understand NASA's future plans for space travel • Compare urban design to a possible space station on the moon or Mars • Describe constraints on a possible space station • Understand the importance of a transportation hub for life in space • Compare an airport to a possible space station port • Plan and design a space station for the moon or Mars

Relevant Standards:	Learning Goals:	Learning Objectives:
Science: **NJ SLS.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. **NJ SLS.MS-ETS1-2** Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.		

Formative Assessments	Summative Assessments:	Performance Assessments:	Major Activities/ Assignments (required):
Pre-Assessment , Teacher Observation, Class Participation, Warm Ups, Homework, Exit Slips, Status Checks, Popsicle Sticks, Thumbs Up/Thumbs Down, Stomp on Three, Student Progress Charts & Reflections	Unit test, Extended constructed response questions, Quizzes, Student logbook, Team projects	Space station design	**Major Assignments (required):** Space station design **Major Activities (required):** Space station design

Possible Assessment Modifications /Accommodations:
Word Banks, Calculators, Bold Key Words within Questions, Reduce Answer Choices

Instructional Strategies:
Chunking Content into Digestible Bites, Recording and Representing Knowledge, Reviewing Content, Using Homework, Examining Similarities and Differences, Examining Errors in Reasoning, Practicing Skills, Strategies and Processes, Engaging Students in Cognitively Complex Tasks Involving Hypothesis Generation and Testing

Possible Instructional Modifications /Accommodations:
Instructional Scaffolds, “Interleave”-style Homework Assignments (solutions are made available to students at home to utilize as references for homework assignments), Calculators, Small Group Review of Pre-Requisite Skills (such as measurement, units of measure, and properly reading a stopwatch and tape measure), Review and Re-teaching of Difficult Concepts

Possible Instructional Modifications /Accommodations:
Unit Vocabulary:
Essential: International Space Station **Non-Essential:** NA

Interdisciplinary Connections (Applicable Standards):	**Integration of Technology:**	**21st Century Themes:**	**21st Century Skills:**
E/LA: NJ SLS.RST.6-8.1, NJ SLS.RST.6-8.3, NJ SLS.RST.6-8.7, NJ SLS.RST. 6-12.4, NJ SLS.RST.6-12.7 NJ SLS.WHST.6-8.1, NJ SLS.WHST.6-8.7 Mathematics: NJ SLS.7.RP A.1, NJ SLS.7.NS.B.3, NJ SLS.7.G.A.1, NJ SLS.7.G.A.2 Science: MS-ETS1-1, MS-ETS1-2 Equity Integration (Using James Banks' Levels of Multicultural Integration): https://diversity.asee.org/deicommittee/2021/05/04/two-strategies-towards-socially-just-engineering-integration-in-high-school-science/ Technology: NJ SLS.8.2.8.ETW.2, NJ SLS.8.1.8.IC.1, NJ SLS.8.1.8.ED.3, NJ SLS.8.1.8.IC.3, NJ SLS.8.2.8.ETW.2, NJ SLS.8.2.8.ETW.2, NJ SLS.9.3.ST-ET.1, NJ SLS.9.3.HL-THR.4, NJ SLS.8.2.8.ED.5, NJ SLS.8.2.8.ED.3.a, NJ SLS.8.2.8.ED.7, NJ SLS. 8.2.8.NT.3, NJ SLS.8.2.8.ED.6, NJ SLS. 8.2.8.ED.2 21st Century Life and Careers: NJ SLS.9.3.ST.1, NJ SLS.9.3.ST.2, NJ SLS.9.3.ST.3, NJ SLS.9.3.ST-ET.1, NJ	Technology: Virtual Reality Glasses, Computer to sketch	__x__ Global Awareness __x__ Civic Literacy ____ Financial, Economic, Business, & Entrepreneurial Literacy ____ Health Literacy	____ Creativity & Innovation ____ Media Literacy __x_ Critical Thinking and Problem Solving __x_ Life and Career Skills _x__ Information & Communication Technologies Literacy __x_ Communication & Collaboration ____ Information Literacy

Interdisciplinary Connections (Applicable Standards):	Integration of Technology:	21st Century Themes:	21st Century Skills:
SLS.9.3.ST-ET.2, NJ SLS.9.3.ST-ET.3, NJ SLS.9.3.ST-ET.4, NJ SLS.9.3.ST-ET.5, NJ SLS.9.3.ST-ET.6, NJ SLS.9.3.ST-SM.1, NJ SLS.9.3.ST-SM.2, NJ SLS.9.3.ST-SM.4			

Resources:
Texts/Materials: NASA website, internet, YouTube clips, virtual reality glasses