Marking Period	Unit Title	Recommended Instructional Days
Trimester 1	Engineering Design Process	18 - 20 days

NJSLS - Science: *TItle*	NJSLS - Science: *Performance Expectations*	**Recommended Activities, Investigations, Interdisciplinary Connections, and/or Student Experiences to Explore NJSLS-S within Unit**
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 helps it function as needed to solve a given problem. • **K-2-ETS1-3** Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.	
FOUNDATION Disciplinary: *Core Idea*	**FOUNDATION Disciplinary: *Statement***	
• K-2-ETS1.A: Defining and Delimiting Engineering Problems • K-2-ETS1.B: Developing Possible Solutions • K-2-ETS1.C: Optimizing the Design Solution	• asking questions, making observations, and gathering information help in thinking about problems to be solved • designs can be conveyed through sketches, drawings, and physical models • there is always more than one possible solution; compare and test designs	**Essential Question/s:** • How can I use the design process to explore and define a problem by asking questions, making observations, and gathering information? • How can I use information to develop and test solutions to find the best solution to a problem? **Activity Description:**

FOUNDATION **Science and Engineering Practices:** ***Core Idea***	**FOUNDATION** **Science and Engineering Practices:** ***Statement***	• Utilize the design process to explore and define a problem by asking questions, making observations, and gathering information • Apply the information to develop and test solutions to identify the best solution to the problem **Interdisciplinary Connections:** **Connections to Math:** • **2.MD.D.10** Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph. • **2.G.A.1** Recognize and draw shapes having specified attributes, such as a given number of angles or a given number of equal faces. Identify triangles, quadrilaterals, pentagons, hexagons, and cubes. • **MP2** Reason abstractly and quantitatively. • **MP4** Model with mathematics. • **MP5** Use appropriate tools strategically. **Connections to ELA:** • **W.2.8** Recall information from experiences or gather information from provided sources to answer a question. • **SL.2.5** Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.
• Asking Questions and Defining Problems • Developing and Using Models • Analyzing and Interpreting Data	• ask questions about the world; define a problem that can be solved with a tool or object • develop a simple model based on evidence • analyze data to determine if an object or tool works as intended	
FOUNDATION **Crosscutting Concepts:** ***Core Idea***	**FOUNDATION** **Crosscutting Concepts:** ***Statement***	
• Structure and Function	• shape and stability of objects' structures are related to their function	
Social and Emotional Learning: ***Competencies***	**Social and Emotional Learning:** ***Sub-Competencies***	
• Responsible Decision-Making • Relationship Skills • Self-Management • Social Awareness • Self Awareness	• Develop, implement, and model effective problem-solving and critical thinking skills • Utilize positive communication and social skills to interact effectively with others • Recognize the skills needed to establish and and achieve personal and educational goals • Demonstrate an understanding of the need for mutual respect when viewpoints differ. • Demonstrate an awareness of the expectations for social interactions in a variety of ways. • Recognize the importance of self-confidence in handling daily tasks and challenges.	

Assessments (Formative) ***To show evidence of meeting the standard/s, students will successfully engage within:***	**Assessments (Summative)** ***To show evidence of meeting the standard/s, students will successfully complete:***
<u>Formative Assessments:</u> ● Lesson Check	**<u>Benchmarks/Summative Assessments:</u>** ● Unit Test ● Performance Based Assessment

Differentiated Student Access to Content: **Teaching and Learning *Resources/Materials***			
Core Resources	**Alternate Core Resources** ***IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core Resources**
● Workbook ● Leveled Readers ● Hands-on Activities ● Interactive Worktext	● Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake ● Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat instructions as needed.	● Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.	● Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect students to related talent development opportunities.

Supplemental Resources

Technology:

- *Sort It Out: ask questions to define a problem about designing a strainer that can separate objects based on size and shape. Evaluate the design, compare them with others, and redesign.*
- *Runaway Wagon: develop and test solutions to stop or slow a wagon that has rolled away.*
- *Engineer It - Build a Water Bottle Holder: define a problem and develop solutions that take into account the structure and function of their bottle holder*

Other:

- ***Math -*** *Identify Shapes; Make a Bar Graph*
- ***ELA -*** *Use Visuals; Recall Information*
- ***Social Studies***
  - ***People in Science & Engineering:*** *Mary Ann Horton*
  - ***Careers in Science & Engineering:*** *Transportation Engineer*

Differentiated Student Access to Content:
Recommended *Strategies & Techniques*

Core Resources	**Alternate Core Resources *IEP/504/At-Risk/ESL***	**ELL Core Resources**	**Gifted & Talented Core**
• Large group instruction • Small group instruction • Think Pair Share • Cooperative group work • Multimedia presentations • K-W-L • Manipulatives • Leveled Readers	• Utilize a multi-sensory (VAKT) approach during instruction, provide alternate presentations of skills by varying the method (repetition, simple explanations, additional examples, modeling, etc.), modify test content and/or format, allow students to retake • Deliver instruction utilizing varied learning styles including audio, visual, and tactile/kinesthetic, provide individual instruction as needed, modify assessments and/or rubrics, repeat instructions as needed.	• Extend time requirements, preferred seating, positive reinforcement, check often for understanding/review, oral/visual directions/prompts when necessary, supplemental materials including use of an online bilingual dictionary, and modified assessment and/or rubric.	• Create an enhanced set of introductory activities, integrate active teaching/learning opportunities, incorporate authentic components, propose interest-based extension activities, and connect students to related talent development opportunities.

<table>
<tr><td rowspan="4">NJSLS CAREER READINESS, LIFE LITERACIES & KEY SKILLS</td><td colspan="2">Disciplinary Concept: Creativity & Innovation/Critical Thinking & Problem Solving / Technology Literacy</td></tr>
<tr><td>Core Ideas:</td><td>● Brainstorming can create new, innovative ideas.
● Critical thinkers must first identify a problem then develop a plan to address it to effectively solve the problem.
● Collaboration can simplify the work an individual has to do and sometimes produce a better product.</td></tr>
<tr><td>Performance Expectation/s:</td><td>● 9.4.2.CI.1: Demonstrate openness to new ideas and perspectives (e.g., 1.1.2.CR1a, 2.1.2.EH.1, 6.1.2.CivicsCM.2).
● 9.4.2.CI.2: Demonstrate originality and inventiveness in work (e.g., 1.3A.2CR1a).
● 9.4.2.CT.1: Gather information about an issue, such as climate change, and collaboratively brainstorm ways to solve the problem (e.g., K-2-ETS1-1, 6.3.2.GeoGI.2).
● 9.4.2.CT.2: Identify possible approaches and resources to execute a plan (e.g., 1.2.2.CR1b, 8.2.2.ED.3).
● 9.4.2.CT.3: Use a variety of types of thinking to solve problems (e.g., inductive, deductive).
● 9.4.2.TL.7: Describe the benefits of collaborating with others to complete digital tasks or develop digital artifacts (e.g., W.2.6., 8.2.2.ED.2).</td></tr>
<tr><td colspan="2">Career Readiness, Life Literacies & Key Skill Practices</td></tr>
<tr><td colspan="2">● Demonstrate creativity and innovation.
● Utilize critical thinking to make sense of problems and persevere in solving them.
● Use technology to enhance productivity, increase collaboration and communicate effectively.
● Work productively in teams while using cultural/global competence.</td></tr>
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New Jersey Legislative Statutes and Administrative Code (place an "X" before each law/statute if/when present within the curriculum map)									
x	Amistad Law: *N.J.S.A. 18A 52:16A-88*		Holocaust Law: *N.J.S.A. 18A:35-28*		LGBT and Disabilities Law: *N.J.S.A. 18A:35-4.35*	x	Diversity & Inclusion: *N.J.S.A. 18A:35-4.36a*		Standards in Action: *Climate Change*