

Innovation Lab Grade 4

Unit Title: Unit 1: Digging into STEAM

Stage 1: Desired Results

Standards & Indicators:

NJSLS Mathematics

- **MP.1:** Make sense of problems and persevere in solving them.
- **MP.2:** Reason abstractly and quantitatively.
- **4.M.A.3:** Apply the area and perimeter formulas for rectangles in real world mathematical problems.

NJSLS Science

- **ETS1.A:** Defining and Delimiting Engineering Problems Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.
- **ETS1.B:** Developing Possible Solutions
 - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
 - Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3)
- **ETS1.C:** Optimizing the Design Solution Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)
- **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.
- **3-5-ETS1-3:** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.1.5.NI.2	Describe physical and digital security measures for protecting sensitive personal information.	Distinguishing between public and private information is important for safe and secure online interactions. Information can be protected using various security measures (i.e., physical and digital)
8.1.5.IC.1	Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.	The development and modification of computing technology is driven by individual's needs and wants and can affect individuals differently.
8.1.5.AP.1	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.	Different algorithms can achieve the same result. Some algorithms are more

Innovation Lab Grade 4

		appropriate for a specific use than others.
8.1.5.AP.2	Create programs that use clearly named variables to store and modify data.	Programming languages provide variables, which are used to store and modify data.
8.1.5.AP.3	Create programs that include sequences, events, loops, and conditionals.	A variety of control structures are used to change the flow of program execution (e.g., sequences, events, loops, conditionals).
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.	Programs can be broken down into smaller parts to facilitate their design, implementation, and review.
8.1.5.AP.5	Modify, remix, or incorporate pieces of existing programs into one's own work to add additional features or create a new program.	Programs can also be created by incorporating smaller portions of programs that already exist.
8.1.5.AP.6	Develop programs using an iterative process, implement the program design, and test the program to ensure it works as intended.	Individuals develop programs using an iterative process involving design, implementation, testing, and review.
8.2.5.ED.4	Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).	Engineering design requirements include desired features and limitations that need to be considered.

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.	An individual's passions, aptitude and skills can affect his/her employment and earning potential.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.	
9.4.5.CI.4	Research the development process of a product and identify the role of failure as a part of the creative process.	Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.	
9.4.5.DC.1	Explain the need for and use of copyrights.	Intellectual property rights exist to protect the original works of individuals. It is allowable to use other people's ideas in one's own work provided that proper credit is
9.4.5.DC.2	Provide attribution according to intellectual property rights guidelines using public domain or creative commons media.	

Innovation Lab Grade 4

9.4.5.DC.3	Distinguish between digital images that can be reused freely and those that have copyright restrictions.	given to the original source.
9.4.5.DC.4	Model safe, legal, and ethical behavior when using online or offline technology.	Sending and receiving copies of media on the internet creates the opportunity for unauthorized use of data, such as personally owned video, photos, and music.
9.4.5.DC.5	Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.	Digital identities must be managed in order to create a positive digital footprint.
9.4.5.DC.6	Compare and contrast how digital tools have changed social interactions.	Digital tools have positively and negatively changed the way people interact socially.
9.4.5.DC.7	Explain how posting and commenting in social spaces can have positive or negative consequences.	
9.4.5.DC.8	Propose ways local and global communities can engage digitally to participate in and promote climate action.	Digital engagement can improve the planning and delivery of climate change actions.
9.4.5.IML.1	Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).	Digital tools and media resources provide access to vast stores of information, but the information can be biased or inaccurate.
9.4.5.IML.4	Determine the impact of implicit and explicit media messages on individuals, groups, and society as a whole.	Accurate and comprehensive information comes in a variety of platforms and formats and is the basis for effective decision-making.
9.4.5.IML.5	Distinguish how media are used by individuals, groups, and organizations for varying purposes.	
9.4.5.IML.6	Use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions.	Specific situations require the use of relevant sources of information.
9.4.5.IML.7	Evaluate the degree to which information meets a need including social emotional learning, academic, and social.	
9.4.5.TL.3	Format a document using a word processing application to enhance text, change page formatting, and include appropriate images, graphics, or symbols.	Different digital tools have different purposes.
9.4.5.TL.5	Collaborate digitally to produce an artifact.	Collaborating digitally as a team can often develop a better artifact than an individual working alone.
<u>Central Idea/Enduring Understanding:</u> STEAM is a combination of science, technology, engineering, arts, and mathematics used to solve real world		<u>Essential/Guiding Question:</u> - What is STEAM and why is it important? - What does it mean to be a responsible digital citizen?

Innovation Lab Grade 4

problems with hands-on collaborative learning. • A digital citizen is someone who uses the internet and other digital technology to responsibly participate within their community. • Protecting your information online is essential for your privacy now and into the future. • Coding is a basic literacy language used to communicate in the digital world. It is the set of digital commands needed for technology to work.	• What steps can be made to protect your information online? • What is coding and how does it impact my life?
<u>Content:</u> Week 1- Intro to STEAM (classroom procedures and creating a class rubric for self and teacher assessment) Week 2 - What does a STEAM class look like, how does it function, and what does the T mean in STEAM? Week 3 & 4 - Digital citizenship/protecting your online identity and chromebook introduction/shortcuts/and care (commonsensemedia.org lessons) Week 5 - Code intro (what is coding, why is it important, how can I use it) – coding robot. Week 6 - Practice coding using coding software and given tasks Week 7 - Coding task trials and videoing of coding attempts with robot Week 8 - Coding presentation with robot/sharing of video/discussion/reflection/assessment	<u>Skills (Objectives):</u> • Define STEAM and how it can be useful in my life. • Define technology and research the history of technology. • Demonstrate knowledge of a STEAM classroom and how it functions (collaboration, location of materials, procedures) • Explain & demonstrate ways to be a responsible digital citizen. • Define coding and how it is used in the real world. • Use code to program a robot to complete assigned tasks.
<u>Interdisciplinary Connections:</u> Interdisciplinary curriculum coordination will be done with other departments on a regular basis. The nature of the Innovation Lab (STEAM driven) discipline incorporates: • Real world, hands-on, collaborative learning experiences involving science, technology, engineering, arts, and mathematics (STEAM) • Basic principles of algebra, geometry, chemistry, electricity, and physics through real world learning experiences designed to develop critical thinking, collaborative and problem solving skills. • Opportunity to discover, create, and own solutions to real-world problems while using the latest technologies. • Leadership and problem solving skills through collaborations and presentations. <u>NJSLS ELA Standards</u>	

Innovation Lab Grade 4

- **RI.CR.4.1.** Refer to details and examples as textual evidence when explaining what an informational text says explicitly and make relevant connections when drawing inferences from the text.
- **RI.MF.4.6.** Use evidence to show how graphics and visuals (e.g., illustrations, charts, graphs, diagrams, timelines, animations) support central ideas.
- **W.IW.4.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **W.IW.4.2.D:** Use precise language and domain-specific vocabulary to inform about or explain the topic
- **W.WP.4.4:** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
- **W.RW.4.7:** Write routinely over extended time frames (with time for research and revision) and shorter time frames (a single sitting) for a range of tasks, purposes, and audiences
- **SL.PE.4.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.PE.4.1.B.** Follow agreed-upon rules for discussions and carry out assigned roles.
- **SL.PE.4.1.C.** Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
- **SL.PE.4.1.D.** Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
- **L.WF.4.2** -Demonstrate command of the conventions of encoding and spelling.
- **L.WF.4.2.C.** -Spell grade-appropriate words correctly, consulting references as needed.
- **L.KL.4.1.** -Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **L.KL.4.1.B.** -Choose words and phrases to convey ideas precisely.
- **L.VL.4.2.** -Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.
- **L.VL.4.2.A.** -Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase.
- **L.VL.4.2.C.** -Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.
- **L.KL.4.1.A.** -Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases.

Stage 2: Assessment Evidence

<u>Performance Task(s):</u> ● Presentation of a coded robot. ● Completing a given task for coding.	<u>Other Evidence:</u> ● Completion of weekly exit tickets ● Rubric ● Classroom discussions/participation
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Stage 3: Learning Plan

<u>Learning Opportunities/Strategies:</u> ● Week 1 - Intro to STEAM (procedures and creating a class rubric). Establish classroom procedures and expectations. ● Week 2 - What does STEAM look like and what does the T mean in STEAM?	<u>Resources:</u> ● Commonsensemedia.org ● procedure slide show ● Chromebooks ● Exit ticket ● KWL chart about the term technology ● articles/books/videos about technology
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Innovation Lab Grade 4

Defining the history and present term of the word technology. Give examples of technology (pros and cons) and how we use it. • Week 3 & 4- Digital citizenship/online safety and chromebook introduction/shortcuts/and care • Week 5 - Code intro and program tied to coding robot • Week 6 - Practice coding using coding software • Week 7 - Coding task trials • Week 8 - Coding reflection/assessment • Each class will follow this format: ○ Do Now activity ○ Direct instruction ○ Discussion/Model	• Chromebooks • Exit ticket • Commonsensemedia.org lessons • Chromebook shortcut poster • Chromebook care video • Chromebooks • Exit ticket • Google slides presentations on digital citizenship/safety • Dash/Root Robot • iPads with supported apps • Code.org • Coding programs • Instructional supporting videos • Chromebooks • Exit ticket • Create a Maze • Keva Bot Maze • iPads with supported apps • Code.org • Coding programs • Instructional supporting videos • Chromebooks • Exit ticket • Create a Maze • Keva Bot Maze • Complete task assigned with robot • Rubric • Chromebooks • Exit ticket • Create a Maze • Keva Bot Maze • Chromebooks • iPads with supported apps • Exit ticket • Guest presenters: when available/if applicable -STEM2Space
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Innovation Lab Grade 4

○ Apply concepts ○ Allow time for independent exploration			
<u>Differentiation</u> *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation			
High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Steam Exit Ticket Extension Tasks Adaptation of materials and requirements Elevated text or question complexity Independent student options Projects completed individually or with partners Self-selection of research Open-ended activities Expert mentorship	Steam Exit Ticket Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	Steam Exit Ticket <u>Materials</u> Provide text in alternative formats, such as Braille, large print, audio formats, or digital text Use peer readers Permit highlighting of text List discussion questions prior to reading text Vocabulary lists and/or study guides Provide lecture notes/outline <u>Environment</u> Reduce visual or auditory distractions Preferential seating Post a visual schedule Emphasize multi-sensory learning <u>Directions</u> Use oral, recorded, and/or printed directions	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Innovation Lab Grade 4

		Highlight key words in directions Give brief and concrete directions Have student verbalize steps Repeat, clarify, or reword directions Scaffolded Instruction <u>Time</u> Alert students before transitions Provide additional time for tasks Extra response time	
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Unit Title: Unit 2: Making Connections

Stage 1: Desired Results

Standards & Indicators:

NJSLS Mathematics

- **MP.1:** Make sense of problems and persevere in solving them.
- **MP.2:** Reason abstractly and quantitatively.
- **4.M.A.3:** Apply the area and perimeter formulas for rectangles in real world mathematical problems.

NJSLS Science

- **ETS1.A:** Defining and Delimiting Engineering Problems Possible solutions to a problem are limited by available materials and resources (constraints). The success of a designed solution is determined by considering the desired features of a solution (criteria). Different proposals for solutions can be compared on the basis of how well each one meets the specified criteria for success or how well each takes the constraints into account.
- **ETS1.B:** Developing Possible Solutions
 - Research on a problem should be carried out before beginning to design a solution. Testing a solution involves investigating how well it performs under a range of likely conditions. (3-5-ETS1-2)
 - At whatever stage, communicating with peers about proposed solutions is an important part of the design process, and shared ideas can lead to improved designs. (3-5-ETS1-2)
 - Tests are often designed to identify failure points or difficulties, which suggest the elements of the design that need to be improved. (3-5-ETS1-3)

Innovation Lab Grade 4

- **ETS1.C:** Optimizing the Design Solution Different solutions need to be tested in order to determine which of them best solves the problem, given the criteria and the constraints. (3-5-ETS1-3)
- **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.
- **3-5-ETS1-3:** Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.2.5.ED.1	Explain the functions of a system and its subsystems.	Engineering design is a systematic and creative process of communicating and collaborating to meet a design challenge.
8.2.5.ED.2	Collaborate with peers to collect information, brainstorm to solve a problem, and evaluate all possible solutions to provide the best results with supporting sketches or models.	
8.2.5.ED.3	Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task.	
8.2.5.ED.5	Describe how specifications and limitations impact the engineering design process.	Engineering design requirements include desired features and limitations that need to be considered.
8.2.5.ED.6	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process.	
8.2.5.ITH.2	Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.	A new tool may have favorable or unfavorable results as well as both positive and negative effects on society. Technology spurs new businesses and careers.
8.2.5.ITH.3	Analyze the effectiveness of a new product or system and identify the positive and/or negative consequences resulting from its use.	
8.2.5.ITH.4	Describe a technology/tool that has made the way people live easier or has led to a new business or career.	
8.1.5.CS.1	Model how computing devices connect to other components to form a system.	Computing devices may be connected to other devices to form a system as a way to extend their capabilities.
8.1.5.CS.2	Model how computer software and hardware work together as a system to accomplish tasks.	Software and hardware work together as a system to accomplish tasks (e.g., sending, receiving, processing, and storing units of information)
8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.	Shared features allow for common troubleshooting strategies that can be effective for many systems.
8.2.5.EC.1	Analyze how technology has contributed to or reduced inequities in local and global communities and determine its short- and long-term effects.	Technological choices and opportunities vary due to factors such as differences in economic resources, location, and cultural values.

Innovation Lab Grade 4

Career Readiness, Life Literacies and Key Skills		
Standard	Performance Expectations	Core Ideas
9.4.5.CI.3	Participate in a brainstorming session with individuals with diverse perspectives to expand one's thinking about a topic of curiosity.	Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.
Central Idea/Enduring Understanding: STEAM is a combination of science, technology, engineering, art and mathematics used to solve real world problems with hands-on collaborative learning. In a series circuit, there is only one pathway for the current, but in a parallel circuit there are two or more pathways for it. A switch is a device for making and breaking the connection in an electric circuit. Light energy is sound energy is a kind of kinetic energy with the ability to make types of light visible to human eyes. Sound energy is the movement of energy through a substance – like air or water – and is caused by vibrations. Solids, liquids and gasses transmit sound as waves. Essential/Guiding Question: • What is STEAM and why is it important? • What is electricity? • What makes a circuit work? • What is a switch? • What is the difference between an open and closed electric circuit? • What is the difference between a series and parallel circuit? • What is light and sound energy? How are they alike and different?		
Content: Week 1 - Intro to electricity & snap circuits Week 2 - Types of circuits Week 3- Explore Light and sound energy. Week 4- Modeling of circuit kit & procedures Week 5- Build a circuit Week 6- Create your own circuit. Week 7- Create your own circuit. Week 8- Discussion/Reflection/Assessment Skills (Objectives): • Make observations to show that energy can be transferred from place to place by sound, light, heat, and electric currents. • Apply scientific principles of energy and motion to test and refine a device that converts kinetic energy to electrical energy or uses stored energy to cause motion or produce light or sound. • Students will be able to describe how circuits works • Students will be able to follow directions to create different kinds of circuits. • Students will be able to design their own circuit. • Areas emphasized: building, testing, and troubleshooting circuits, and the basic physics of electricity.		
Interdisciplinary Connections: <u>NJSLS Anchor Standards & Indicators for Speaking and Listening</u> • SL.PE.4.1. Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly. • SL.PE.4.1.B. Follow agreed-upon rules for discussions and carry out assigned roles. • SL.PE.4.1.C. Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.		

Innovation Lab Grade 4

- **SL.PE.4.1.D.** Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

NJSLS Anchor Standards & Indicators for Language

- **L.WF.4.2** -Demonstrate command of the conventions of encoding and spelling.
- **L.WF.4.2.C.** -Spell grade-appropriate words correctly, consulting references as needed.
- **L.VL.4.2.** -Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.
- **L.VL.4.2.A.** -Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase.
- **L.VL.4.2.C.** -Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.
- **L.KL.4.1.A.** -Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases.

Stage 2: Assessment Evidence

Performance Task(s):

- Presentation of completed alternative energy projects
- Completed assessment on parts of the snap circuit kit

Other Evidence:

Weekly Steam Exit Ticket

- Rubric
- Classroom discussions/participation
- Class activities showing knowledge of alternative energy and electricity.

Stage 3: Learning Plan

Learning Opportunities/Strategies:

Week 1 - Introduction to electricity and snap circuits (switches, circuits) Material exploration.

Week 2 - Series vs. parallel circuits. Insulators and conductors. Project #'s TBD

Week 3- Explore Light and sound energy. Scavenger hunt for light and sound energy around the school.

Resources:

- Snap Circuit arcade
- Mentor Text
- Snap Circuit Slideshow
- <https://www.brainpop.com/science/energy/electricity/> (What is electricity?)
- KWL Chart on energy
- Chromebooks
- STEAM exit ticket
- <https://www.youtube.com/watch?v=HOFp8bHTN30> (What is a circuit?)
- Snap Circuits arcade Kit
- Chromebooks
- STEAM log/exit ticket
- Instructional videos on electricity/alternative energy (Renewable Energy 101 | National Geographic - <https://www.youtube.com/watch?v=1kUE0BZtTRc>)
- Snap Circuit arcade Kit
- Chromebooks
- STEAM exit ticket

Innovation Lab Grade 4

Week 4- Intro to procedure and modeling videoing for circuit project build. Project #TBD Week 5- Complete project #'s TBD and practice recording giving objective and explanation. Week 6- Create your own circuit. Identify type of circuit. Week 7- Create your own circuit. Identify type of circuit. Week 8- Discussion/reflection/assessment	• What is light energy?- https://youtu.be/LCEqlvHFIhM • What is sound?- https://youtu.be/3-xKZKxXuu0 • https://prezi.com/0gdnoq6vun9s/snap-circuits-presentation/ • Snap Circuit arcade Kit • Chromebooks • STEAM exit ticket • Snap Circuit arcade Kit • Chromebooks • STEAM exit ticket • Snap Circuit arcade Kit • Chromebooks • STEAM exit ticket • Mentor Text • Snap Circuit arcade Kit • Chromebooks • STEAM exit ticket • Snap Circuit arcade Kit • Chromebooks • STEAM exit ticket
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Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Exit Ticket Extension Tasks Adaptation of materials and requirements Elevated text or question complexity Independent student options Projects completed individually or with partners	Exit Ticket Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	Exit Ticket <u>Materials</u> Provide text in alternative formats, such as Braille, large print, audio formats, or digital text Use peer readers Permit highlighting of text List discussion questions prior to reading text	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency

Innovation Lab Grade 4

Self-selection of research Open-ended activities Expert mentorship		Vocabulary lists and/or study guides Provide lecture notes/outline <u>Environment</u> Reduce visual or auditory distractions Preferential seating Post a visual schedule Emphasize multi-sensory learning <u>Directions</u> Use oral, recorded, and/or printed directions Highlight key words in directions Give brief and concrete directions Have student verbalize steps Repeat, clarify, or reword directions Scaffolded Instruction <u>Time</u> Alert students before transitions Provide additional time for tasks Extra response time	Provide word banks Allow for translators, dictionaries
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Innovation Lab Grade 4

Unit Title: Unit 3: Learning with Legos

Stage 1: Desired Results

Standards & Indicators:

NJSLS Mathematics

- **MP 1.** Make sense of problems and persevere in solving them.
- **MP 2.** Reason abstractly and quantitatively.

NJSLS Science

- **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.

NJSLS Anchor Standards for Speaking and Listening

- **NJSLSA.SL1.** Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- **NJSLSA.SL2.** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- **NJSLSA.SL5.** Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
- **SL.PE.4.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.PE.4.1.B.** Follow agreed-upon rules for discussions and carry out assigned roles.
- **SL.PE.4.1.C.** Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
- **SL.PE.4.1.D.** Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

NJSLS Art Anchor Standard 1: Generating and conceptualizing ideas

- **1.2.5.Cr1f.** Brainstorm goals and plans for a media art audience.

NJSLS Art Anchor Standard 2: Organizing and developing ideas

- **1.2.5.Cr2b:** Model ideas, plan in an effective direction.
- **1.2.5.Cr2c:** Brainstorm goals and plans for a media art audience.

NJSLS Art Anchor Standard 3: Refining and completing products

- **1.2.5.Cr3c:** Explore how elements and components can be altered for clear communication and intentional effects, point of view, perspective, and refine media artworks to improve clarity and purpose.

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.1.5.NI.1	Develop models that successfully transmit and receive information using both wired and wireless methods.	Information needs a physical or wireless path to travel to be sent and received.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.	Data can be organized, displayed, and presented to highlight relationships.
8.1.5.DA.3	Organize and present collected data visually to	Individuals can select, organize, and

Innovation Lab Grade 4

	communicate insights gained from different views of the data.	transform data into different visual representations and communicate insights gained from the data.
8.1.5.DA.5	Propose cause and effect relationships, predict outcomes, or communicate ideas using data.	Many factors influence the accuracy of inferences and predictions.
Career Readiness, Life Literacies and Key Skills		
Standard	Performance Expectations	Core Ideas
9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.	An individual's passions, aptitude and skills can affect his/her employment and earning potential.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.	
9.4.5.CI.4	Research the development process of a product and identify the role of failure as a part of the creative process.	Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global (e.g., 6.1.5.CivicsCM.3).	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
<u>Central Idea/Enduring Understanding:</u> - STEAM is a combination of science, technology, engineering, art and mathematics used to solve real world problems with hands-on collaborative learning. - Simple machines are tools that make work easier. Examples of tasks made easier include lifting a heavy weight, moving a heavy object over a distance, pushing things apart, changing the direction of a force, or holding an object together. - Structures are designed to provide solutions to a human need. Engineers must understand Science, Technology, Engineering, and Mathematics (STEM) to create structures to meet code and safety specifications. - Investigate the effects of balanced and unbalanced forces using Legos.		<u>Essential/Guiding Question:</u> - What is STEAM and why is it important? - How are simple machines used in the world and how are they helpful to us?

Innovation Lab Grade 4

<u>Content:</u> Week 1 - Introduction to Engineering Week 2 - Introduction to Simple Machines Week 3 - Crane Week 4 - Bridge Week 5 - Bobsled Week 6 - Push Car Derby Week 7 - Build Your Own	<u>Skills (Objectives):</u> • Explore how pushing and pulling affects a mechanism's motion and speed. • Make predictions about how the forces acting on an object can change its motion. • Understanding the concepts of simple machines.
<u>Interdisciplinary Connections:</u> <u>NJSLS Anchor Standards & Indicators for Reading</u> • NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. • NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. • NJSLSA.R8. Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. • NJSLSA.R10. Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed. • RI.CR.4.1. Refer to details and examples as textual evidence when explaining what an informational text says explicitly and make relevant connections when drawing inferences from the text. • RI.MF.4.6. Use evidence to show how graphics and visuals (e.g., illustrations, charts, graphs, diagrams, timelines, animations) support central ideas. <u>NJSLS Anchor Standards for Writing</u> • NJSLSA.W1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. • NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. • NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. • NJSLSA.W8. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. • NJSLSA.W9. Draw evidence from literary or informational texts to support analysis, reflection, and research. • NJSLSA.W10. Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. • W.IW.4.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly. • W.IW.4.2.D: Use precise language and domain-specific vocabulary to inform about or explain the topic • W.WP.4.4: With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing. • W.RW.4.7: Write routinely over extended time frames (with time for research and revision) and shorter time frames (a single sitting) for a range of tasks, purposes, and audiences <u>NJSLS Anchor Standards for Speaking and Listening</u> • NJSLSA.SL1. Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.	

Innovation Lab Grade 4

- **NJSLSA.SL2.** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- **NJSLSA.SL5.** Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
- **SL.PE.4.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.PE.4.1.B.** Follow agreed-upon rules for discussions and carry out assigned roles.
- **SL.PE.4.1.C.** Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
- **SL.PE.4.1.D.** Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

NJSLS Anchor Standards for Language

- **NJSLSA.L1.** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **NJSLSA.L2.** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **NJSLSA.L3.** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
- **NJSLSA.L4.** Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
- **NJSLSA.L6.** Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.
- **L.WF.4.2** -Demonstrate command of the conventions of encoding and spelling.
- **L.WF.4.2.C.** -Spell grade-appropriate words correctly, consulting references as needed.
- **L.KL.4.1.** -Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **L.KL.4.1.B.** -Choose words and phrases to convey ideas precisely.
- **L.VL.4.2.** -Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.
- **L.VL.4.2.A.** -Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase.
- **L.VL.4.2.C.** -Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.
- **L.KL.4.1.A.** -Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases.

Stage 2: Assessment Evidence

Performance Task(s):

- Creation of Lego model.
- Completing a given task.

Other Evidence:

- Exit ticket
- Rubric
- Classroom discussions/participation

Innovation Lab Grade 4

Stage 3: Learning Plan

Learning Opportunities/Strategies:

- Week 1 -
Intro to Engineering. What is engineering?

- Week 2 -
Identify and differentiate the six types of simple machines: lever, screw, pulley, wheel and axle, inclined plane, and wedge. Differentiate and classify specific examples of simple machines found in school and household items. These include a screwdriver, nutcracker, screw, flagpole pulley, ramp, and seesaw. An example would be that an inclined plane is a ramp to make it easier for a heavy object to be moved up or down. Identify and classify the simple machines which compose a compound

- Week 3- Design and construct an apparatus that contains a simple machine. Lakeshore Brick Kits: Project Crane (Pulley)

- Week 4- Design and construct an apparatus that contains a simple machine. Lakeshore Brick Kits: Project Drawbridge (Pulley)

- Week 5- Design and construct an apparatus that contains a simple machine. Lego Education BricQ Motion Set: Project 40 Bobsled (Incline Plane)

- Week 6 -
Explore materials for the structure and simple machine unit. Identify materials.

Resources:

- KWL Chart on engineering
- Introductory video on engineering from Crash Course Kids
- Mentor text: SAMPLES: Rosie Revere, Engineer
Engineering, The Most Magnificent Thing"
Engineering Design Process, Engineering in our
Everyday Lives (on EPIC), Dream Jobs in Engineering
(on EPIC)
- https://www.teachengineering.org/content/umo/_/lesson/s/umo_challenges/umo_challenges_lesson01_presentation_v2_tedl_dwc.pdf

- Simple Machines for Kids | Learn all about the 6 simple machines! Video by Clarendon Learning
- Brainpop Simple Machines
- Google forms identifying simple machines

- Lakeshore Learning Brick Kits
- Building instruction blueprint cards
- Exit Ticket

- Lakeshore Learning Brick Kits
- Building instruction blueprint cards
- Exit Ticket

- Video at www.Legoeducation.com
- Lego Education BricQ Motion Essential Set
- Building instructions book B
- Chromebooks
- Procedure Slide Show
- Exit ticket

- Video at www.Legoeducation.com
- Lego Education BricQ Motion Essential Set
- Building instructions book A

Innovation Lab Grade 4

Introduction to Lego Education BricQ Motion Set: Project 28 Push Car Derby (Wheel & Axel) • Week 7- Build your own simple machine and identify which type: lever, screw, pulley, wheel and axle, inclined plane, and wedge Each class will follow this format: Do now activity Direct Instruction Discussion/Model Apply Concepts Allow time for independent exploration		• Chromebooks • Exit ticket • Yardstick • Student worksheet • Legos • Chromebooks • Exit ticket	
<u>Differentiation</u> *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation			
High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Steam Exit Ticket Extension Tasks Adaptation of materials and requirements Elevated text or question complexity Independent student options Projects completed individually or with partners Self-selection of research Open-ended activities Expert mentorship	Steam Exit Ticket Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	Steam Exit Ticket <u>Materials</u> Provide text in alternative formats, such as Braille, large print, audio formats, or digital text Use peer readers Permit highlighting of text List discussion questions prior to reading text Vocabulary lists and/or study guides Provide lecture notes/outline <u>Environment</u> Reduce visual or auditory distractions	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to: breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing ELL supports should include, but are not limited to, the following:: Extended time Provide visual aids Repeated directions Differentiate based on proficiency Provide word banks Allow for translators, dictionaries

Innovation Lab Grade 4

		Preferential seating Post a visual schedule Emphasize multi-sensory learning <u>Directions</u> Use oral, recorded, and/or printed directions Highlight key words in directions Give brief and concrete directions Have student verbalize steps Repeat, clarify, or reword directions Scaffolded Instruction <u>Time</u> Alert students before transitions Provide additional time for tasks Extra response time	
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Unit Title: Unit 4: Production and Animation

Stage 1: Desired Results

Standards & Indicators:

NJSLS - Mathematics

- **MP 1.** Make sense of problems and persevere in solving them.
- **MP 2.** Reason abstractly and quantitatively.

NJSLS - Science

Innovation Lab Grade 4

- **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.

Computer Science and Design Thinking

Standard	Performance Expectations	Core Ideas
8.1.5.NI.1	Develop models that successfully transmit and receive information using both wired and wireless methods.	Information needs a physical or wireless path to travel to be sent and received.
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.	Data can be organized, displayed, and presented to highlight relationships.
8.1.5.DA.3	Organize and present collected data visually to communicate insights gained from different views of the data.	Individuals can select, organize, and transform data into different visual representations and communicate insights gained from the data.
8.1.5.DA.5	Propose cause and effect relationships, predict outcomes, or communicate ideas using data.	Many factors influence the accuracy of inferences and predictions.
8.1.8.AP.6	Refine a solution that meets users' needs by incorporating feedback from team members and users.	Individuals design and test solutions to identify problems taking into consideration the diverse needs of the users and the community.
8.1.8.AP.8	Systematically test and refine programs using a range of test cases and users.	
8.2.5.NT.1	Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.	Technology innovation and improvement may be influenced by a variety of factors.
8.2.5.NT.2	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.	Engineers create and modify technologies to meet people's needs and wants; scientists ask questions about the natural world.
8.2.5.NT.3	Redesign an existing product for a different purpose in a collaborative team.	
8.2.5.NT.4	Identify how improvement in the understanding of materials science impacts technologies..	

Career Readiness, Life Literacies and Key Skills

Standard	Performance Expectations	Core Ideas
9.2.5.CAP.3	Identify qualifications needed to pursue traditional and non-traditional careers and occupations.	An individual's passions, aptitude and skills can affect his/her employment and earning potential.
9.2.5.CAP.4	Explain the reasons why some jobs and careers require specific training, skills, and certification (e.g., life guards, child care, medicine, education) and examples of these requirements.	
9.4.5.CI.4	Research the development process of a product and identify the role of failure as a part of the creative process.	Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.

Innovation Lab Grade 4

9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.	The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills.
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global .	
<u>Central Idea/Enduring Understanding:</u> - STEAM is a combination of science, technology, engineering, art and mathematics used to solve real world problems with hands-on collaborative learning. 3D printing is additive manufacturing: creating physical, three-dimensional objects from digital designs by building them layer by layer. - Stop-motion animation brings "Imagination to Life: The Science, Art, and Technology of Storytelling." It empowers students to merge fundamental technology (photo-sequencing and frame rates) with engineering (building camera rigs) and storytelling (storyboards and character arcs) to make inanimate objects appear to move on their own.		<u>Essential/Guiding Question:</u> - How can technology help us solve real-world problems? - How do designers turn ideas into physical objects? - What is a 3D printer and how does it work? - What makes a strong 3D design? - How can we use technology to tell a story? - How do small changes create the illusion of movement? - How do teamwork and communication help during filming? - What is stop motion animation and how can it help us in real life?
<u>Content:</u> - Week 1 - Introduction and review of 3D printing. - Week 2 - Introduction and review of Tinkercad - Week 3- Tinkercad Student Product - Week 4 - Intro and Review to Stop Motion - Week 5- Stop Motion Filming - Week 6 - Stop Motion Filming - Week 7 - Assessment/Reflection/Presentation		<u>Skills (Objectives):</u> - Define 3D printing and how it applies to my life. - Identify and explain knowledge of 3D printing - Use Tinkercad program to create a 3D design to be printed Define stop motion animation and how it applies to my life. - Use a stop motion animation program to produce an animated story. - Be able to identify stop motion animation in the real world. - Benchmark Assessment
<u>Interdisciplinary Connections:</u> <u>Anchor Standards & Indicators for Reading</u> NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.		

Innovation Lab Grade 4

- **NJSLSA.R7.** Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
- **NJSLSA.R8.** Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.
- **NJSLSA.R10.** Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.
- **RI.CR.4.1.** Refer to details and examples as textual evidence when explaining what an informational text says explicitly and make relevant connections when drawing inferences from the text.
- **RI.MF.4.6.** Use evidence to show how graphics and visuals (e.g., illustrations, charts, graphs, diagrams, timelines, animations) support central ideas.

Anchor Standards for Writing

- **NJSLSA.W1.** Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.
- **NJSLSA.W4.** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- **NJSLSA.W6.** Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.
- **NJSLSA.W8.** Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.
- **NJSLSA.W9.** Draw evidence from literary or informational texts to support analysis, reflection, and research.
- **NJSLSA.W10.** Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.
- **W.IW.4.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **W.IW.4.2.D:** Use precise language and domain-specific vocabulary to inform about or explain the topic
- **W.WP.4.4:** With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, and editing.
- **W.RW.4.7:** Write routinely over extended time frames (with time for research and revision) and shorter time frames (a single sitting) for a range of tasks, purposes, and audiences

Anchor Standards for Speaking and Listening

- **NJSLSA.SL1.** Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- **NJSLSA.SL2.** Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- **NJSLSA.SL5.** Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
- **SL.PE.4.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
- **SL.PE.4.1.B.** Follow agreed-upon rules for discussions and carry out assigned roles.
- **SL.PE.4.1.C.** Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
- **SL.PE.4.1.D.** Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.

Anchor Standards for Language

Innovation Lab Grade 4

- **NJSLSA.L1.** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.
- **NJSLSA.L2.** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
- **NJSLSA.L3.** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
- **NJSLSA.L4.** Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
- **NJSLSA.L6.** Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.
- **L.WF.4.2** -Demonstrate command of the conventions of encoding and spelling.
- **L.WF.4.2.C.** -Spell grade-appropriate words correctly, consulting references as needed.
- **L.KL.4.1.** -Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **L.KL.4.1.B.** -Choose words and phrases to convey ideas precisely.
- **L.VL.4.2.** -Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.
- **L.VL.4.2.A.** -Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase.
- **L.VL.4.2.C.** -Consult reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation and determine or clarify the precise meaning of key words and phrases.
- **L.KL.4.1.A.** -Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases.

Stage 2: Assessment Evidence

<u>Performance Task(s):</u> ● Presentation of completed 3D design ● Presentation of completed stop motion animation story	<u>Other Evidence:</u> ● Weekly Steam Exit Ticket (exit ticket) ● Rubric ● Classroom discussions/participation ● Team Evaluation
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Stage 3: Learning Plan

<u>Learning Opportunities/Strategies:</u> ● Week 1 - Introduction and Review to 3D printing. Review of how 3D printing is helpful in our world. Identify parts of a 3D printer. ● Week 2 - Introduction and review to Tinkercad. Students model key elements of the Tinkercad program.	<u>Resources:</u> ● KWL Chart on 3D printing ● Chromebooks ● iPads with supported apps ● Presentation video ● Guest presenters: when available/if applicable ● https://www.google.com/search?q=stop+motion+on+chromebook&rlz=1C1CHBF_enUS913US913&oq=stop+motion+on+chrom&aqs=chrome.0.0i512j69i57j0i22i30l4j0i10i22i30j0i390l3.2798j0j7&sourceid=chrome&ie=UTF-8&safe=active&ssui=on#kpvalbx=_SAwEYczrKoOQ_QaH1YqQCw19 (Stop Motion How to)
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Innovation Lab Grade 4

• Week 3- Design and construct students's assigned project on Tinkercad. Start the printing process. • Week 4 - Introduction and review of Stop Motion. Introduction to new effects (sound, background and speed) • Week 5- Create stop motion production • Week 6 - Create stop motion production • Week 7 - Assessment/Reflection/Presentation • Each class will follow this format: ○ Do Now activity ○ Direct instruction ○ Discussion/Model ○ Apply concepts ○ Allow time for independent exploration	• Stop Motion Slide Show • Examples of Stop Motion videos https://www.digitalwish.com/dw/digitalwish/view_less_on_plans?id=6404 • Tinkercad • Stop motion animation app from chrome store • Exit ticket • Props for stop motion • Green tri fold boards • Art supplies for backdrop
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Differentiation *Please note: Teachers who have students with 504 plans that require curricular accommodations are to refer to Struggling and/or Special Needs Section for differentiation

High-Achieving Students	On Grade Level Students	Struggling Students	Special Needs/ELL
Exit Ticket	Exit Ticket	Exit Ticket	Any student requiring further accommodations and/or modifications will have them individually listed in their 504 Plan or IEP. These might include, but are not limited to:
Extension Tasks	Varying instructional strategies	<u>Materials</u> Provide text in alternative formats, such as Braille, large print, audio formats, or digital text	breaking assignments into smaller tasks, giving directions through several channels (auditory, visual, kinesthetic, model), and/or small group instruction for reading/writing
Adaptation of materials and requirements	In-class interventions	Use peer readers	ELL supports should include, but are not limited to, the following::
Elevated text or question complexity	Compacting activity	Permit highlighting of text	Extended time
Independent student options	Extend or abbreviate duration of assignments	List discussion questions prior to reading text	Provide visual aids
Projects completed individually or with partners		Vocabulary lists and/or study guides	Repeated directions
Self-selection of research			Differentiate based on proficiency
Open-ended activities			Provide word banks
Expert mentorship			Allow for translators, dictionaries

Innovation Lab Grade 4

		Provide lecture notes/outline <u>Environment</u> Reduce visual or auditory distractions Preferential seating Post a visual schedule Emphasize multi-sensory learning <u>Directions</u> Use oral, recorded, and/or printed directions Highlight key words in directions Give brief and concrete directions Have student verbalize steps Repeat, clarify, or reword directions Scaffolded Instruction <u>Time</u> Alert students before transitions Provide additional time for tasks Extra response time	
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Innovation Lab Grade 4

Pacing Guide

Course Name	Resource	Standards
MP 1 Digging Into Stem/ Coding		
UNIT 1 Digging into STEAM 8 lessons	• KWL chart about the term technology • Articles/books/videos about technology • Commonsensemedia.org lessons • Chromebook shortcut poster • Chromebook care video • iPads with supported apps • Code.org • Coding programs • Instructional supporting videos • Complete task assigned with robot • Rubric • Chromebooks • Exit ticket • Guest presenters: when available/if applicable • Root Robot • Dash Robot • Sphero	• 9.2.5.CAP.3, 9.2.5.CAP.4 • 9.4.2.DC.2 • 9.4.5.CI.4, 9.4.5.CT.3, 9.4.5.CT.4 • 9.4.5.DC.1, 9.4.5.DC.2, 9.4.5.DC.3, 9.4.5.DC.4, 9.4.5.DC.5, 9.4.5.DC.6, 9.4.5.DC.7, 9.4.5.DC.8, • 9.4.5.IML.1, 9.4.5.IML.4, 9.4.5.IML.5, 9.4.5.IML.6, 9.4.5.IML.7 • 9.4.5.TL.5, 9.4.5.TL.3 • NJSLSA.R4., NJSLSA.R7, NJSLSA.R8, NJSLSA.R.10, • RI.4.1, RI.4.4., RI.4.7, • NJSLSA.W1, NJSLSA.W.4, NJSLSA.W6, NJSLSA.W8, NJSLSA.W9, NJSLSA.W10, N.4.2.D, W.4.6 • NJSLSA.SL1, NJSLSA.SL2, NJSLSA.SL5, SL.4.1.B, SL.4.1.C, SL.4.1.D • NJSLSA.L.1, NJSLSA.L2, NJSLSA.L3, NJSLSA.L4, NJSLSA.L6 • L.4.2.D, L.4.3, L.4.4A&C, L.4.6 • 8.1.5.NI.2, 8.1.5.AP.1, 8.1.5.AP.3, 8.1.5.AP.4, 8.1.5.AP.5, 8.1.5.AP.6, 8.1.5.CS.1, 8.1.5.CS.2, 8.1.5.CS.3 • 8.2.5.ED.4
MP 2		
UNIT 2 Making Connections • 8 Lessons	• What is light energy? - https://youtu.be/LCEqlvHF1hM • What is sound? - https://youtu.be/3-xKZKxXu0 • Circuit kits	• 3-5-ETS1 Engineering Design • 8.2.5.ED.1, 8.2.5.ED.2, 8.2.5.ED.3, 8.2.5.ED.5.; 8.2.5.ED.6: • 8.2.5.ITH.2, 8.2.5.ITH.3, 8.2.5.ITH.4 • 9.4.5.CI.3

Innovation Lab Grade 4

	• Task cards • Rubric • Online Steam Exit Ticket • Presentation	• NJSLSA.SL, NJSLSA.SL2, NJSLSA.SL5 • SL.4.1, SL.4.6
MP 3		
UNIT 3 Learning with Legos • 7 lessons	• Videos at www.Legoeducation.com • Lego Education BricQ Motion Essential Set • Building instructions book • Chromebooks • Procedure Slide Show • STEAM rubric (exit ticket) • Lakeshore Brick Kits • Masking tape • Yardstick • Unit Online Assessment • Online Steam Exit Ticket (weekly) • Rubric (weekly) • KWL Chart on engineering • Introductory video on engineering from Crash Course Kids • Mentor text: SAMPLES: <u>Rosie Revere, Engineer Engineering</u>, <u>The Most Magnificent Thing</u>, <u>Engineering Design Process</u>, <u>Engineering in our Everyday Lives (on EPIC)</u>, <u>Dream Jobs in Engineering (on EPIC)</u> • https://www.teachengineering.org/content/umo/_lessons/umo_challenges/umo_challenges_lesson01_presentation_v2_tedl_dwc.pdf • Simple Machines for Kids Learn all about the 6 simple machines! Video by Clarendon Learning • Brainpop Simple Machines • Google forms identifying simple machines • Exit ticket • Structure and simple machines building materials	• 8.1.5.NI.1, 8.1.5.DA.1, 8.1.5.DA.3, 8.1.5.DA.5, 8.1.8.AP.6, 8.1.8.AP.8 S • 9.2.5.CAP.3, 9.2.5.CAP.4 • 9.4.5.CI.4, 9.4.5.CT.4 • NJSLSA.R4, NJSLSA.R7, NJSLSA.R8, NJSLSA.R10 • RI.4.1, RI.4.4, RI.4.7 • NJSLSA.W1, NJSLSA.W4, NJSLSA.W6, NJSLSA.W8, NJSLSA.W9, NJSLSA.W10 • W.4.2, W.4.6 • NJSLSA.SL1, NJSLSA.SL2, NJSLSA.SL5 • SL.4., NJSLSA.L6 • L.4.2, L.4.3, L.4.4, L.4.6 • 1.2.5.Cr1f, 1.2.5.Cr2b, 1.2.5.Cr2c, 1.2.5.Cr3c

Innovation Lab Grade 4

MP 4		
UNIT 4 Production and Animation 7 Lessons	- KWL Chart on 3D printing - Chromebooks - iPads with supported apps - Presentation videos - Exit ticket - Guest presenters: when available/if applicable - Student worksheet https://www.google.com/search?q=stop+motion+on+chrome+book&rlz=1C1CHBF_enUS913US913&oq=stop+motion+on+chrom&aqs=chrome.0.0i512j69i57j0i22i30l4j0i10i22i30j0i390l3.2798j0j7&sourceid=chrome&ie=UTF-8&safe=active&sui=on#kpvalbx=_SAwEYcZrKoOQ_QaH1YqQCw19 (Stop Motion How to) - Stop Motion Slide Show - Examples of Stop Motion videos https://www.digitalwish.com/dw/digitalwish/view_lesson_plans?id=6404 - Stop motion animation app from chrome store - Chromebook - Props for stop motion - Green tri fold boards - Art supplies for backdrop	8.1.5.NI.1: , 8.1.5.DA.1, 8.1.5.DA.3 ,8.1.5.DA.5, 8.1.8.AP.6 ,8.1.8.AP.8 8.2.5.NT.1, 8.2.5.NT.2, 8.2.5.NT.3, 8.2.5.NT.4 9.2.5.CAP.3, 9.2.5.CAP.4, 9.4.5.CI.4, 9.4.5.CT.3, 9.4.5.CT.4 - NJSLSA.R4,NJSLSA.R7, NJSLSA.R8, NJSLSA.R10, - RI.4.1, RI.4.4, RI.4.7 - NJSLSA.W1, NJSLSA.W4, NJSLSA.W6, NJSLSA.W8, NJSLSA.W9, NJSLSA.W10 - W.4.2, W.4.6. - NJSLSA.SL1, NJSLSA.SL2, NJSLSA.SL5, SL.4.1 - NJSLSA.L1, NJSLSA.L2., NJSLSA.L3., NJSLSA.L4 NJSLSA.L6. - L.4.2., L.4.3., L.4.4., L.4.6