

Innovation Lab Grade 5

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.

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.

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 needs and wants and can affect individuals differently.
8.1.5.IC.2	Identify possible ways to improve the accessibility and usability of computing technologies to address the diverse needs and wants of users.	
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.
8.1.5.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 appropriate for a specific use than others.

Innovation Lab Grade 5

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. Programs can also be created by incorporating smaller portions of programs that already exist.
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.	
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.

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 (e.g., 6.1.5.CivicsCM.3).	
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 given to the original source.
9.4.5.DC.2	Provide attribution according to intellectual property rights guidelines using public domain or creative commons media.	

Innovation Lab Grade 5

9.4.5.DC.3	Distinguish between digital images that can be reused freely and those that have copyright restrictions.	
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 problems with hands-on collaborative		<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 5

learning. A digital citizen is someone who uses the internet and other digital technology to responsibly participate within their community. • A digital footprint is the record of all your interactions online. Once something is posted or shared online, it can be there forever. Understanding your digital footprint helps you choose and control what you leave online for others to see and find. • 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 is a digital footprint and why does it matter? • 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/digital footprint 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) and program tied to 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. • Explain & demonstrate ways to be a responsible digital citizen. • Define technology and research the history of technology. • 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 5

- **RI.CR.5.1.** Quote accurately from **an informational** text when explaining what the text says explicitly and make relevant connections when drawing inferences from the text.
- **L.VL.5.2.** Determine or clarify the meaning of unknown and multiple-meaning academic and domain-specific words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
- **RI.MF.5.6.** Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on web pages) and explain how the information contributes to an understanding of the text in which it appears.
- **W.IW.5.2** Use precise language and domain-specific vocabulary to inform about or explain the topic.
- **W.WP.5.4.D** With adult and peer feedback, and digital or print tools such as a dictionary, thesaurus, and/or spell checker, evaluate whether the writing achieved its goal and make changes in content or form as necessary.
- **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 by making comments that contribute to the discussion and elaborate on the remarks of others
- **SL.PE.4.1.D** Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.
- **L.WF.5.2.H** Spell grade-appropriate words correctly, consulting references as needed.
- **L.KL.5.1.** Use knowledge of language and its conventions when writing, speaking, reading, or listening.
- **L.VL.5.2.** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
- **L.VL.5.2.A.** Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase.
- **L.VL.5.2.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.5.1.A** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases.

Stage 2: Assessment Evidence

Performance Task(s):

- Presentation of a coded robot.
- Completing a given task for coding.

Other Evidence:

- Weekly STEAM Exit ticket
- Rubric
- Classroom discussions/participation

Stage 3: Learning Plan

Learning Opportunities/Strategies:

- 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? Defining the history and present term of the word technology. Give examples of technology (pros and cons) and how we use it.

Resources:

- Commonsensemedia.org
 - Procedure slide show
 - Chromebooks
 - STEAM rubric / Exit ticket
- KWL chart about the term technology
- Articles/books/videos about technology
 - Chromebooks
 - STEAM rubric / Exit ticket

Innovation Lab Grade 5

• Week 3 & 4- Digital citizenship/digital footprint 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 ○ Apply concepts ○ Allow time for independent exploration	• Commonsensemedia.org lessons • Chromebook shortcut poster • Chromebook care video • Chromebooks • STEAM rubric (exit ticket) • Google slides presentations on digital citizenship/digital footprint • Resources Dash, Sphero, Root • Code.org • Coding programs • Instructional supporting videos • Chromebooks • STEAM rubric / Exit ticket • Learn how to use the video recording on the chromebook for video presentations • Keva Bot Mazes • Create a Maze • Resources Dash, Sphero, Root • Code.org • Coding programs • Instructional supporting videos • Chromebooks • STEAM rubric / Exit ticket • Keva Bot Mazes • Create a Maze • Resource TBD • Complete task assigned with robot • Rubric • Chromebooks • STEAM rubric / Exit ticket • Keva Bot Mazes • Create a Maze • Chromebooks • IPAD with supported apps • STEAM rubric / Exit ticket • Guest presenters: when available/if applicable ○ STEM2Space
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Innovation Lab Grade 5

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
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 5

		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 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.

Innovation Lab Grade 5

- **5-ESS3-1** Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources, environment, and address climate change issues.

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. Often, several design solutions exist, each better in some way than the others.
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.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.
8.2.5.ED.5	Describe how specifications and limitations impact the engineering design process.	
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.	

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.

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?

Innovation Lab Grade 5

• A switch is a device for making and breaking the connection in an electric circuit. • Alternative energy is energy generated in ways that do not deplete natural resources or harm the environment, especially by avoiding the use of fossil fuels and nuclear power.	• What is the difference between a series and parallel circuit? • What is alternative energy and how is it used?
<u>Content:</u> Week 1 - Introduction to electricity Week 2 - Types of circuits Week 3 - Alternative 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	<u>Skills (Objectives):</u> • Students will be able to describe how a series and parallel circuit work. • Students will be able to follow directions to create different kinds of circuits. • Students will be able to define and identify alternative energy sources. • Students will be able to design their own circuit.
<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.R10. Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed. • RI.5.1. Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text. • RI.5.4. Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area. <u>NJSLS Anchor Standards & Indicators for Writing</u> • NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. • 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.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.5.2.D. Use precise language and domain-specific vocabulary to inform about or explain the topic. • W.5.6. With some guidance and support from adults and peers, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting. <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 5

- **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.5.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
 - **SL.5.1.B.** Follow agreed-upon rules for discussions and carry out assigned roles.
 - **SL.5.1.C** Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others
 - **SL.5.1.D** Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.

NJSLS Anchor Standards & Indicators 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.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.5.2.** Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
 - **E.** Spell grade-appropriate words correctly, consulting references as needed.
- **L.5.4.** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
 - **A.** Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase.
 - **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.5.6.** Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

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:

Resources:

- Snap Circuits Green Alternative Energy Kit

Innovation Lab Grade 5

Week 1 - Introduction to electricity and snap circuits (switches, circuits). Material exploration.	• Mentor Text • Snap Circuit Slideshow • https://www.brainpop.com/science/energy/electricity/ (What is electricity?) • KWL Chart on energy • Chromebooks • STEAM exit ticket
Week 2 - Series vs. parallel circuits. Insulators and conductors. Project TBD	• https://www.youtube.com/watch?v=HOFp8bHTN30 (What is a circuit?) • Snap Circuits Green Alternative Energy Kit • Chromebooks • STEAM exit ticket
Week 3 - Explore types of alternative energy and how they impact our world. Complete solar energy snap circuit project TBD.	• Instructional videos on electricity/alternative energy (Renewable Energy 101 National Geographic - https://www.youtube.com/watch?v=1kUE0BZtTRc) • Snap Circuit Green Alternative Energy Kit • Chromebooks • STEAM exit ticket
Week 4 - Intro procedure and modeling videoing for circuit project build.	• https://prezi.com/0gdnoq6vun9s/snap-circuits-presentation/ • https://www.youtube.com/watch?v=jYeV90caWCI (How to make a video on chromebook and upload to google classroom) • Snap Circuit Green Alternative Energy Kit • Chromebooks • STEAM exit ticket
Week 5 - Complete project TBD	• Snap Circuit Green Alternative Energy Kit • Chromebooks • STEAM exit ticket
Week 6 - Create your own circuit. Identify type of circuit.	• Snap Circuit Green Alternative Energy Kit • Chromebooks • STEAM exit ticket • Mentor Text
Week 7 - Create your own circuit. Identify type of circuit.	• Snap Circuit Green Alternative Energy Kit • Chromebooks • STEAM exit ticket
Week 8 - Discussion/reflection/assessment	• Snap Circuit Green Alternative Energy Kit

Innovation Lab Grade 5

		● Chromebooks ● STEAM 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 Reflection 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 Reflection Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	STEAM Reflection <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	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 5

		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 3: Learning with Legos

Stage 1: Desired Results

Standards & Indicators:

ART Anchor Standard 1: Generating and conceptualizing ideas

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

ART Anchor Standard 2: Organizing and developing ideas

- **1.2.5.Cr2b:** Model ideas, plan in an effective direction.

Innovation Lab Grade 5

- **1.2.5.Cr2c:** Brainstorm goals and plans for a media art audience.

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 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.

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.

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.
- 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

Essential/Guiding Question:

- What is STEAM and why is it important?
- What is the engineering design process?
- How are simple machines used in the world and how are they helpful to us?

Innovation Lab Grade 5

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. - Understand the Engineering Design Process	
<u>Content:</u> Week 1 - Introduction to Engineering Week 2 - Introduction to Simple Machines Week 3 - Catapult Week 4 - Elevator Week 5 - Free Throw Week 6 - Weightlifter 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.
<u>Interdisciplinary Connections:</u> <u>NJSLS Listening and Speaking</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. - NJSLSA.SL2. Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally. - NJSLSA.SL3. Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric. - NJSLSA.SL4. Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience. - NJSLSA.SL6. Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate. <u>NJSLS Anchor Standards & Indicators for Language</u> - 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.5.2.E. Spell grade-appropriate words correctly, consulting references as needed. - L.5.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening.	

Innovation Lab Grade 5

- L.5.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
 - A. Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase.
 - 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.5.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other logical relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

NJSLS Anchor Standards & Indicators 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.5.2.D. Use precise language and domain-specific vocabulary to inform about or explain the topic.
- W.5.6. With some guidance and support from adults and peers, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.

Stage 2: Assessment Evidence

Performance Task(s):

- Completion of Lego Task Challenges

Other Evidence:

- Weekly STEAM reflection (exit ticket)
- Rubric
- Classroom discussions/participation
- Class activities showing knowledge of alternative energy and electricity.

Stage 3: Learning Plan

Learning Opportunities/Strategies:

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

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/_lessons/umo_challenges/umo_challenges_lesson01_presentation_v2_tedl_dwc.pdf

Innovation Lab Grade 5

- 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: Catapult (Lever)
- Week 4- Design and construct an apparatus that contains a simple machine. Lakeshore Brick Kits: Elevator (Pulley)
- Week 5- Design and construct an apparatus that contains a simple machine. Lego Education BricQ Motion Set: Project 20 Free Throw (Lever)
- Week 6 -
Explore materials for the structure and simple machine unit. Identify materials. Introduction to Lego Education BricQ Motion Set: Project 68 Weightlifter (Pulley)
- 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

- 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
- Chromebooks
- Exit ticket
- Student worksheet
- Video at www.Legoeducation.com
- Lego Education BricQ Motion Essential Set
- Building instructions book
- Chromebooks
- Exit ticket
- Student worksheet

Innovation Lab Grade 5

<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 Reflection 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 Reflection Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	STEAM Reflection <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>	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 5

		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

- **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-ETS1-1** Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
- **3-5-ETS1-2** Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Innovation Lab Grade 5

- **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. Often, several design solutions exist, each better in some way than the others.
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.1	Explain how societal needs and wants influence the development and function of a product and a system.	Societal needs and wants determine which new tools are developed to address real-world problems.
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. Engineers create and modify technologies to meet people's needs and wants; scientists ask questions about the natural world.
8.2.5.NT.2	Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries, and societies.	
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.	
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.

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 (CR1a).	Curiosity and a willingness to try new ideas (intellectual risk-taking) contributes to the development of creativity and innovation skills.

Innovation Lab Grade 5

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.	
9.4.5.CT.1	Identify and gather relevant data that will aid in the problem-solving process	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. 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 are the benefits of 3D printing? - 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? What careers use stop motion animation?
<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 of 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 - 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>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.		

Innovation Lab Grade 5

- **NJSLSA.R10.** Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.
- **RI.5.1.** Quote accurately from a text and make relevant connections when explaining what the text says explicitly and when drawing inferences from the text.
- **RI.5.4.** Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.

NJSLS Anchor Standards & Indicators for Writing

- **NJSLSA.W2.** Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
- **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.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.5.2.D.** Use precise language and domain-specific vocabulary to inform about or explain the topic.
- **W.5.6.** With some guidance and support from adults and peers, use technology, including the Internet, to produce and publish writing as well as to interact and collaborate with others; demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting.

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.5.1.** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.
 - **SL.5.1.B.** Follow agreed-upon rules for discussions and carry out assigned roles.
 - **SL.5.1.C** Pose and respond to specific questions by making comments that contribute to the discussion and elaborate on the remarks of others
 - **SL.5.1.D** Review the key ideas expressed and draw conclusions in light of information and knowledge gained from the discussions.

NJSLS Anchor Standards & Indicators 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.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.

Innovation Lab Grade 5

- 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.5.2. Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.
 - E. Spell grade-appropriate words correctly, consulting references as needed.
- L.5.4. Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 5 reading and content, choosing flexibly from a range of strategies.
 - A. Use context (e.g., cause/effect relationships and comparisons in text) as a clue to the meaning of a word or phrase.
 - 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.5.6. Acquire and use accurately grade-appropriate general academic and domain-specific words and phrases, including those that signal contrast, addition, and other relationships (e.g., however, although, nevertheless, similarly, moreover, in addition).

Stage 2: Assessment Evidence

Performance Task(s):

- Presentation of completed-3D design
- Presentation of completed stop motion animation story based on student designed rubric

Other Evidence:

- Weekly STEAM–exit ticket
- Rubric
- Classroom discussions/participation
- Team Evaluation

Stage 3: Learning Plan

Learning Opportunities/Strategies:

- Week 1 - Review of 3D printing. Review of how 3D printing is helpful in our world. Identify parts of a 3D printer.
- Week 2 -Review Tinkercad. Students model key elements of the Tinkercad program. Students create a rubric for 3D design.
- Week 3- Design and construct students’s assigned project on Tinkercad. Start the printing process.
- Week 4 - Review of Stop Motion. Review effects for videos (sound, background and speed). Introduce video formatting. Students create a rubric for assessment of video.
- Week 5- Create stop motion production
- Week 6 - Create stop motion production

Resources:

- 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&oeq=stop+motion+on+chrom&aqs=chrome.0.0i512j69i57j0i22i30l4j0i10i22i30j0i390l3.2798j0j7&sourceid=chrome&ie=UTF-8&safe=active&ssui=on#kpvalbx=_SAwEYcZrKoOO_QaH1YqQCw19 (Stop Motion How to)
- Stop Motion Slide Show

Innovation Lab Grade 5

• Week 7 - Presentation/Team assessment reflection • Each class will follow this format: ○ Do Now activity ○ Direct instruction ○ Discussion/Model ○ Apply concepts ○ Allow time for independent exploration	• Examples of Stop Motion videos https://www.digitalwish.com/dw/digitalwish/view_lesson_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
STEAM Reflection 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 Reflection Varying instructional strategies In-class interventions Compacting activity Extend or abbreviate duration of assignments	STEAM Reflection <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 5

		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 5

Pacing Guide

Course Name	Resource	Standards
MP 1		
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 ● Code.org ● Learn how to use the video recording on the chromebook ● Coding programs ● Instructional supporting videos ● Complete task assigned with robot ● Rubric ● Make a video ● Chromebooks ● IPAD with supported apps ● Present video ● STEAM rubric (exit ticket) ● Guest presenters: when available/if applicable ● Root robot, Sphero robot, Dash robot	● Math MP1, MP2, ● 9.2.2.CAP.1, 9.2.5.CAP.3, 9.2.5.CAP.4, ● 9.4.2.DC.2, 9.4.2.DC.3, 9.4.2.DC.4, 9.4.2.DC.5, 9.4.2.DC.6 ● 9.4.2.IML.1, 9.4.2.IML.3 ● 9.4.2.TL.7 ● 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.5.1, RI.5.4., RI.5.7, NJSLSA.W1, NJSLSA.W.4, NJSLSA.W6, NJSLSA.W8, NJSLSA.W9, NJSLSA.W10, N.5.2.D, W.5.6, NJSLSA.SL1, NJSLSA.SL2, NJSLSA.SL5, SL.5.1.B, SL.5.1.C, SL.5.1.D, NJSLSA.L.1, NJSLSA.L2, NJSLSA.L3, NJSLSA.L4, NJSLSA.L6, L.5.2.E, L.5.3, L.5.4A&C, L.5.6, 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 Weeks	● KWL chart about the term science ● articles/books/videos about electricity and alternate energy	● 9.4.5.CI3, ● ETS1.A, ETS1.B, ETS1.C, 3-5ETS1-2, 3-5ETS1-3, ● 8.2.5.ED.1, 8.2.5.ED.2,

Innovation Lab Grade 5

	- Google slide presentations on electricity and alternative energy - Google forms - STEAM - Snap Circuit Kits - Rubric - Chromebooks - Guest speakers when available	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, 5-Ess3-1, - NJSLSA.R4, NJSLSA. R7, NJSLSA.R10, RI5.1, RI5.4, - NJSLSA.W2, NJSLSA.W4, NJSLSA.W6, NJSLSA.W8, NJSLSA.W10, W5.2D, - W5.6, NJSLSA.SL1, NJSLSA.SL2, NJSLSA.SL5, SL5.1, SL5.1.B, SL5.1.C, SL5.1.D, NJSLSA.L1, NJSLSA.L2, NJSLSA.L4, NJSLSA.L6, L.5.2, L5.2.E, L5.4, L5.6
MP 3		
UNIT 3 Learning with Legos 7 lessons	- Video 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 Reflection (weekly) - Rubric (weekly) - KWL Chart on engineering - Introductory video on engineering from Crash Course Kids - Mentor text: SAMPLES: <u>Rosie Revere, Engineer Engineering, The Most Magnificent Thing</u> <u>Engineering Design Process, Engineering in our Everyday Lives (on EPIC), Dream Jobs in Engineering (on EPIC)</u> https://www.teachengineering.org/content/umo/_lessons/umo_challenges/umo_challenges_1	- NJSLSA.R4., NJSLSA.R7.,NJSLSA.R8. NJSLSA.R10. - RI.5.1.,RI.5.4. ,RI.5.7. - NJSLSA.W1., NJSLSA.W4. NJSLSA.W6., NJSLSA.W8. - NJSLSA.W9.,NJSLSA.W10, W.5.2.D. ,W.5.6. - NJSLSA.L1.,NJSLSA.L2., NJSLSA.L3, NJSLSA.L4. NJSLSA.L6. , L.5.2.E. , L.5.3.,L.5.4., L.5.6. 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 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 8.1.5.NI.1: 8.1.5.DA.1, 8.1.5.DA.3, 8.1.5.DA.5 P 8.1.8.AP.6, 8.1.8.AP.8 1.2.5.Cr1f, 1.2.5.Cr2b, 1.2.5.Cr2c, 1.2.5.Cr3c

Innovation Lab Grade 5

	esson01_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	
MP 4		
UNIT 4 Production and Animation 7 weeks	- 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+chromebook&rlz=1C1CHBF_enUS913US913&oq=stop+motion+on+chrom&aqs=chrome.69i57j0i22i30l4j0i10i22i30j0i390l3.2798j0j7&sourceid=chrome&ie=UTF-8&safe=active&sui=on#kpvalbx=_SAwEYcZrKoOO_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	- Math MP1, MP2, - Science 3-5-ETS1-2, 3-5-ETS1-1, 3-5-ETS1-2, 3-5-ETS1-3, 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 8.2.5.NT.1, 8.2.5.NT.2, 8.2.5.NT.3, 8.2.5.NT.4 9.4.5.CI.3, 9.4.5.CI.4, 9.4.5.CT.1, - NJSLSA.R4, NJSLSA.R7, NJSLSA.R10, RI5.1, RI5.4, NJSLSA.W2, NJSLSA.W4, NJSLSA.W6, NJSLSA.W8, NJSLSA.W10, W5.2D, W5.6, - NJSLSA.SL1, NJSLSA.SL2, NJSLSA.SL5, SL5.1, SL5.1.B, SL5.1.C, SL5.1.D, NJSLSA.L1, NJSLSA.L2, NJSLSA.L4, NJSLSA.L6, L.5.2, L5.2.E, L5.4, L5.6