Library Media
Grade 5

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Reviewed By: (pending)

Board of Education Approved (pending), Effective Date: September 2020

Scope and Sequence

Month	Unit - Topic
September - Trimester 1	Unit 1
October - Trimester 1	
November - Trimester 1	
December - Trimester 2	Unit 2
January - Trimester 2	
February - Trimester 2	
March - Trimester 2/3	Unit 3
April - Trimester 3	
May - Trimester 3	
June - Trimester 3	

Library Media Standards - Progression of Learning - Disciplinary Concepts and Core Ideas

Unit 1- Life Literacy and Key Skills	
Summary and Rationale	
Books, digital tools and media resources provide access to vast stores of information. Students will revisit digital citizenship with a particular focus on news literacy. They will brainstorm, research, collect data, record information, and analyze data/sources; meanwhile, they will gain hands-on experience with digital tools (including Schoology and the Google Workspace tools) as they explore natural disasters or sustainability initiatives.	
Recommended Pacing	
Trimester 1 (September - November)	
Standards	
NJSLS 9.4 Life Literacies and Key Skills	
Creativity and Innovation	
9.4.5.CI.1	Use appropriate communication technologies to collaborate with individuals with diverse perspectives about a local and/or global climate change issue and deliberate about possible solutions.
9.4.5.CI.2	Investigate a persistent local or global issue, such as climate change, and collaborate with individuals with diverse perspectives to improve upon current actions designed to address the issue.
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.
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.
Critical Thinking and Problem-Solving	
9.4.5.CT.3	Describe how digital tools and technology may be used to solve problems.
9.4.5.CT.4	Apply critical thinking and problem-solving strategies to different types of problems such as personal, academic, community and global.
Digital Citizenship	
9.4.5.DC.1	Explain the need for and use of copyrights
9.4.5.DC.2	Provide attribution according to intellectual property rights guidelines using public domain or creative commons media.
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.
9.4.5.DC.5	Identify the characteristics of a positive and negative online identity and the lasting implications of online activity.
9.4.5.DC.6	Compare and contrast how digital tools have changed social interactions.
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.
Global and Cultural Awareness	
9.4.5.GCA.1	Analyze how culture shapes individual and community perspectives and points of view.
Information and Media Literacy	
9.4.5.IML.1	Evaluate digital sources for accuracy, perspective, credibility and relevance (e.g., Social Studies Practice - Gathering and Evaluating Sources).
9.4.5.IML.2	Create a visual representation to organize information about a problem or issue.
9.4.5.IML.3	Represent the same data in multiple visual formats in order to tell a story about the data.
9.4.5.IML.4	Determine the impact of implicit and explicit media messages on individuals, groups, and society as a whole
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.
9.4.5.IML.7	Evaluate the degree to which information meets a need including social emotional learning, academic, and social.
Technology Literacy	
9.4.5.TL.1	Compare the common uses of at least two different digital tools and identify the advantages and disadvantages of using each.
9.4.5.TL.2	Sort and filter data in a spreadsheet to analyze findings.
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.
9.4.5.TL.4	Compare and contrast artifacts produced individually to those developed collaboratively.
9.4.5.TL.5	Collaborate digitally to produce an artifact.
NJSLS 8.1 Computer Science	

Computing Systems	
8.1.5.CS.2	Model how computer software and hardware work together as a system to accomplish tasks.

Instructional Focus

Enduring Understandings: *Students will understand that...*	Essential Questions:
EU 1.A: The Library Media Center is a place to access information and build new knowledge. EU 1.B: Digital identities must be managed in order to create a positive digital footprint. EU 1.C: Digital tools and media resources provide access to vast stores of information, but the information can be biased or inaccurate.	How can I become an effective user of the library media center? How can I practice safe and responsible behaviors online? How can I use appropriate sources of information from diverse sources, contexts, disciplines, and cultures to answer questions?

Evidence of Learning (Assessments)

PERFORMANCE ASSESSMENT(S) G.R.A.S.P.S
Students will show that they really understand by evidence of…

Option 1: Natural Disasters News Article
Goal: To research and create an online news article about a natural event such as a flood, earthquake, or hurricane.
Role: Researcher
Audience: Your classmates
Situation: Students will examine Natural Disasters: their causes and effects on society.
1. Brainstorm with your classmates, "What do you want to know about natural disasters?"
2. As a class (modeled by teacher), create a Google Form to collect information about specific Natural Disasters (i.e., Type of natural event, name, date, location, etc.). Also include the question, "Where did you find this data?" so that the class can compare/analyze sources if any data conflicts.
3. Then, each student will conduct research about a natural disaster (i.e., Hurricane Sandy, Valdivia Earthquake, etc.). They will use a Google Doc to record their research notes and bibliography information.
4. Then, each student will complete the Google Form using their research notes.
5. To conclude, the class will work together to analyze a Google Sheet with the data collected from the Form responses. Students will reflect on the patterns and other noticings.

Product: Class - Google Form, Sheet. Individual - Google Doc Research Notes, citations, and reflection/critique on data/process (each student will submit).
Standards/Criteria: Students will utilize MLA formats for the citations, use diverse sources, and critique sources/data.

Option 2: Sustainability Research
Introduce the concept of sustainability and its significance in preserving resources and the environment. Explain that students will explore different sustainability areas and research projects related to each area.
● Students will be divided into groups, each assigned a specific sustainability area (e.g., renewable energy, waste reduction, water conservation, biodiversity preservation).
● Using provided resources or conducting independent research, students will identify and research one project that supports or addresses the assigned sustainability area.

- Students will document their findings through a Google Form provided by the teacher, answering questions such as:
  - Sustainability Area Assigned
  - Title and description of the chosen project
  - Purpose and goals of the project
  - Methods or strategies employed in the project
  - Impact or outcomes achieved
  - Importance of the project in promoting sustainability
  - Additional reflections or insights gained
- Each group will submit their completed Google Form documenting their research findings.

Data Analysis:
- Once all groups have submitted their findings, compile the data into a Google Sheet, organizing information by sustainability area and the respective projects researched.
- Collaboratively analyze the collected data as a class, identifying commonalities, differences, and notable aspects across the various sustainability projects.
- Discuss the significance and impact of these projects on promoting sustainability within different areas.

Resources:
8 Examples of Sustainable Development That Will Change the World in 2022 - TRUEGRID Pavers
Top 10 Sustainable Initiatives

Objectives (SLO)

ESSENTIAL KNOWLEDGE (EK) *Students will know…*	LEARNING OBJECTIVES (LO) *Students will be skilled at…*

EK 1.A
● Library media center
● Computers - keyboarding
● 1:1 Chromebook Initiative
● Dewey Decimal System
 	
EK 1.B
● Media Balance
● Clickbait, "the curiosity gap"
● Online gender stereotypes
● Online social interactions
● Cyberbullying
  ○ Bystander
  ○ Upstander
  ○ Empathy
  ○ Bully
  ○ Target
● Online News Articles
  ○ Commercial
  ○ Sponsored content
  ○ Advertisements
	LO 1.A.1: Follow library media procedures, on the command of the library media specialist or on their own.
	LO 1.A.2: Locate and check-out appropriate reading materials.
	LO 1.A.3: Care for books and other library materials.
	LO 1.A.4: Log on to computer, utilize district-approved systems
	LO 1.A.5: Input information using keyboarding skills
	
	LO 1.B.1: Use computers and other technology devices in a responsible manner.
	LO 1.B.2: Evaluate how healthy different types of media choices are
	LO 1.B.3: Identify clickbait and strategies to avoid it
	LO 1.B.4: Describe how gender stereotypes can lead to unfairness or bias
	LO 1.B.5: Describe the benefits and risks of online-only friendships
	LO 1.B.6: Determine the similarities and differences between in-person bullying, cyberbullying, and being mean.
	LO 1.B.7: Identify strategies for dealing with cyberbullying and being an upstander for those being bullied
	LO 1.B.8: Identify the parts and structure of an online news article
	
	LO 1.C.1: Gather information from diverse sources

EK 1.C	LO 1.C.2: Evaluate information
● Research	LO 1.C.3: Format a document
● Information sources: bias, diversity, accuracy	LO 1.C.4: Format a form/spreadsheet with data
● Evaluation of sources	LO 1.C.5: Analyze data
● Document and spreadsheet formatting	
● Data analysis	

Suggested Lesson Resources/Technology Tools

1.A. Library Media Center Orientation   SUGGESTED TIMEFRAME: 1-2 class periods
- Review of library media routines and procedures
- Dewey Decimal System - Book check-out
- Schoology, Clever - Log into Schoology and other district programs using Nutley Schools credentials
- Keyboarding
- 1:1 Chromebook Initiative
    - How-to
    - Nutleyschools.org > District > 1:1 Chromebook Handbook
    - Nutleyschools.org > Students > Request Tech Support

1.B.   SUGGESTED TIMEFRAME: 6-7 class periods
- Common Sense Media - Finding My Media Balance
    - What does media balance mean for me?
    - Finding My Media Balance | Common Sense Education
- Common Sense Media - You Won't Believe This (clickbait)
    - What is clickbait and how can you avoid it?
    - You Won't Believe This! | Common Sense Education
- Common Sense Media - Beyond Gender Stereotypes
    - How do gender stereotypes shape our experiences online?
    - Beyond Gender Stereotypes | Common Sense Education
- Common Sense Media - Digital Friendships
    - How do you keep online friendships safe?
    - Digital Friendships | Common Sense Education
- Common Sense Media - Is it Cyberbullying?
    - What is cyberbullying and what can youdo to stop it?
    - Is It Cyberbullying? | Common Sense Education
- Common Sense Media - Reading News Online Reading News Online | Common Sense Education
- ENRICHMENT - Common Sense Digital Passport games Digital Passport by Common Sense Education

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1.C.   SUGGESTED TIMEFRAME: 3-4 class periods
- Log into Schoology and other district programs using Nutley Schools credentials
- Use of Schoology to access Google Workspace.
- Use of diverse sources of to gather information including: books, online subscription databases, internet resources
- Google Workspace group project:
    - Collaborate with a group to organize a project in a shared spreadsheet. Organize Group Projects in Google Sheets

Modifications

Special Education
- Students' personal device used to log in and access websites
- Flexible seating arrangements, and movement breaks
- Call student name before asking a question
- Extend wait time after asking question
- Scaffolded instructions
- Sensory modifications
- Frequent check-ins
- Extended time or modified assignments

ELL
- Spanish/multilingual book section of library
- Translated materials
- Visual aids
- Opportunites for language practice in groups, language buddies

Gifted and Talented
- Free reading time (in lieu of drill and practice routines)

504
- Preferential seating
- Accessible materials, as per student needs (large print, audio, digital texts, etc.)
- Behavior management support, movement breaks
- Provide a quiet space, if necessary, to minimize distractions
- Accessible materials, as per student needs (large print, audio, digital texts, etc.)
- Frequent check-ins
- Extended time or modified assignments

Virtual
- Utilize online learning platforms (i.e., Google Meet and Schoology) to meet with students virtually, with the goal of introductions and "get-to-know-you" as well as establishing routines/expectations for remote-virtual learning specific to library media.
- Virtual read-alouds, demonstrations, and discussions about library media.
- The Assessment Goal Option 1 would utilize an online platform such as FripGrid to provide information about recognizing cyberbullying and how to be empathetic to victims of cyberbullying.

Career Readiness, Life Literacies, and Key Skills Practices

Please select all career readiness, life literacies, and key skills practices that apply to this unit of study:
- ✓ Act as a responsible and contributing community member and employee.
- ❏ Attend to financial well-being.
- ❏ Consider the environmental, social, and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ✓ Model integrity, ethical leadership, and effective management.
- ❏ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity, increase collaboration and communicate effectively.
- ❏ Work productively in teams while using cultural/global competence.

Unit 2 Computer Science	
Summary and Rationale	
In this unit, students will continue to deepen their understanding of the natural world and technology. They will explore the problem of global warming and how artificial intelligence and technology can be used to help solve problems.	
Recommended Pacing	
Trimester 2 (December - Mid-March)	
Standards	
NJSLS 8.1 Computer Science	
Computing Systems	
8.1.5.CS.1	Model how computing devices connect to other components to form a system.
8.1.5.CS.2	Model how computer software and hardware work together as a system to accomplish tasks.
8.1.5.CS.3	Identify potential solutions for simple hardware and software problems using common troubleshooting strategies.
Networks and the Internet	
8.1.5.NI.1	Develop models that successfully transmit and receive information using both wired and wireless methods.
8.1.5.NI.2	Describe physical and digital security measures for protecting sensitive personal information
Impacts of Computing	
8.1.5.IC.1	Identify computing technologies that have impacted how individuals live and work and describe the factors that influenced the changes.
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
Data and Analysis	
8.1.5.DA.1	Collect, organize, and display data in order to highlight relationships or support a claim.
8.1.5.DA.2	Compare the amount of storage space required for different types of data.
8.1.5.DA3	Organize and present collected data visually to communicate insights gained from different views of the data.

8.1.5.DA.4	Organize and present climate change data visually to highlight relationships or support a claim.
8.1.5.DA.5	Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Algorithms and Programming	
8.1.5.AP.1	Compare and refine multiple algorithms for the same task and determine which is the most appropriate.
8.1.5.AP.2	Create programs that use clearly named variables to store and modify data
8.1.5.AP.3	Create programs that include sequences, events, loops, and conditionals.
8.1.5.AP.4	Break down problems into smaller, manageable sub-problems to facilitate program development.
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.

Instructional Focus

Enduring Understandings: *Students will understand that...*	Essential Questions:
EU 2.A: Google Workspace provides the user with word processing and presentation software that is easily shared. EU 2.B: Crowdsourcing can reduce costs, speed up project timelines, tap in to crowd intelligence and creativity, and engage citizens at all levels of corporate and government processes EU 2.C: Computer programmers can read, modify, and write scripts that change what happens on the screen.	How can I use Google tools effectively? In what ways do different types of media resources (e.g., articles, videos, databases) cater to specific information needs, and how can individuals effectively utilize these resources to address diverse problems or inquiries? What are the fundamental principles underlying script modification, and how does this understanding contribute to creating innovative solutions or enhancements in software applications or digital interfaces?

Evidence of Learning (Assessments)

PERFORMANCE ASSESSMENT(S) G.R.A.S.P.S
Students will show that they really understand by evidence of…

Option 1: Research climate change and present data
Climate Crowd, a global online crowdsourcing tool, allows students, volunteers, conservation professionals, and others living or working in remote areas to collect and share data on how people are adapting to or coping with climate change. Teaching Resources | WWF

Option 2: Technology to Protect the Environment
Goal: Your goal is to persuade the government to utilize technology, such as the development of a robot, to address the global challenges of sustainability, such as reducing, reusing, and recycling waste. Include how this would help solve a global issue, such as to protect marine life and the environment from ocean waste.

Role: You are part of a team of environmental advocates and technology enthusiasts. Your role is to conduct in-depth research, collaborate with peers using Google tools, and present a well-supported and persuasive argument advocating for the government's support in employing technology, such as a specialized robot to combat oceanic pollution.

Audience: Your audience includes government officials, policymakers, environmental organizations, and concerned citizens.

Situation: The increasing levels of environmental issues, such as oceanic pollution, pose severe threats to people, animals, marine life, and ecosystems worldwide. Your task is to leverage your research skills, collaborate effectively using Google tools, and develop a thoroughly researched and compelling presentation to persuade the government to take action, such as funding the creation and implementation of a specialized robot designed to clean ocean trash.

Product/Performance:
Create a persuasive presentation using Google tools (Slides, Docs, etc.) that includes the following components:
- Research and Citations: Conduct thorough research using credible sources and incorporate proper citations (using MLA, APA, or another appropriate citation style) throughout the presentation.
- Data and Evidence: Present factual information, statistics, and evidence highlighting the gravity of the environmental issues (such as ocean pollution) and the potential impact of the product/technology you are suggesting (such as employing a specialized robot).
- Technological Solution: Detail the proposed product/robot's capabilities, design, and potential effectiveness in helping with the environmental issue.
- Benefits and Impact: Clearly articulate the benefits of implementing this technology, such as emphasizing its potential to preserve marine ecosystems and promote environmental sustainability.
- Collaboration and Use of Google Tools: Demonstrate effective collaboration by showing contributions from each team member and evidence of using Google tools for research and presentation creation.

Your presentation will be evaluated based on:
- Research and Citations: Accuracy, credibility, and proper citation of sources used in the presentation.
- Persuasiveness and Evidence: Strength and relevance of arguments supported by accurate data and evidence.
- Technological Solution: Clarity and feasibility of the proposed product/robot's capabilities and potential impact.
- Collaboration and Use of Google Tools: Effective teamwork and proficient use of Google tools for collaboration and presentation development.
- Presentation: Clarity, organization, and persuasiveness during the delivery of the presentation.

Note: Encourage students to conduct comprehensive research from reliable sources, cite their sources properly, collaborate effectively using Google tools, and present their arguments cohesively and persuasively. Stress the importance of ethical research practices and the significance of providing evidence to support their claims.

Objectives (SLO)

ESSENTIAL KNOWLEDGE (EK) *Students will know…*	LEARNING OBJECTIVES (LO) *Students will be skilled at…*

EK 2.A
● Google Workspace
● Effective ways of presenting information in Google Slides
    ○ Write before you design.
    ○ Start with a title slide that piques interest.
    ○ Stick to simple designs
	LO 2.A.1: Creating engaging and informative Google Slide presentations
	LO 2.A.2: Considering target audience and formatting techniques when creating presentations.
	
	LO 2.B.1: Identify a large task that needs to be done
	LO 2.B.2: Rearrange a large task into several smaller tasks

○ Emphasize one point per slide ○ Use text sparingly ○ Select images for impact. ○ Practice your verbal presentation ○ Run it by a classmate. EK 2.B ● Crowdsourcing, internet, social media EK 2.C ● Functions, abstraction	LO 2.B.3:Build a complete solution from several smaller solutions. LO 2.C.1: Combine writing and abstraction to test their own creativity LO 2.C.2: Look for and express regularity in repeated reasoning.

Suggested Lesson Resources/Technology Tools

2.A.   SUGGESTED TIMEFRAME: 3-4 class periods
- Google Slides for Kids - Episode 1
- 30 interactive Google Slides activities for classroom excitement - Ditch That Textbook

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2.B.   SUGGESTED TIMEFRAME: 3-4 class periods
- Teaching Resources | WWF
- Minecraft
- Crowdsourcing   crowdsourcing lessons code.org

2.C.   SUGGESTED TIMEFRAME: 3-4 class periods
- Abstraction with Mad Glibs Abstraction with Mad Glibs
- Creating Functions

Modifications

Special Education
- Students' personal device used to log in and access websites
- Flexible seating arrangements, and movement breaks
- Call student name before asking a question
- Extend wait time after asking question
- Scaffolded instructions
- Sensory modifications
- Frequent check-ins
- Extended time or modified assignments

ELL
- Spanish/multilingual book section of library
- Translated materials
- Visual aids
- Opportunites for language practice in groups, language buddies

Gifted and Talented
- Advanced coding

504
- Preferential seating
- Accessible materials, as per student needs (large print, audio, digital texts, etc.)

- Behavior management support, movement breaks
- Provide a quiet space, if necessary, to minimize distractions
- Accessible materials, as per student needs (large print, audio, digital texts, etc.)
- Frequent check-ins
- Extended time or modified assignments

Virtual
- Utilize online learning platforms (i.e., Google Meet and Schoology) to meet with students virtually, with the goal of introductions and "get-to-know-you" as well as establishing routines/expectations for remote-virtual learning specific to library media.
- Virtual read-alouds, demonstrations, and discussions about library media.

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- ❏ Attend to financial well-being.
- ❏ Consider the environmental, social, and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❏ Model integrity, ethical leadership, and effective management.
- ❏ Plan education and career paths aligned to personal goals.
- ✓ Use technology to enhance productivity, increase collaboration and communicate effectively.
- ❏ Work productively in teams while using cultural/global competence.

For more information: New Jersey Student Learning Standards - Career Readiness, Life Literacies, and Key Skills (pages 15-16)

Unit 3	
Summary and Rationale	
This unit is designed to immerse students in the engineering design process while fostering an understanding of their role in climate action through either a study of hurricanes or of the creative use of recycled materials. Students will explore engineering principles and sustainability concepts of either building hurricane house structures or by crafting various projects using recyclable items. Through hands-on activities, they will develop problem-solving skills, critical thinking, and a deeper appreciation for either sustainable structures or repurposing materials to reduce environmental impact.	
Recommended Pacing	
Trimester 3 (Mid-March - June)	
Standards	
NJSLS 8.2 Design Thinking	
Engineering Design	
8.2.5.ED.1	Explain the functions of a system and its subsystems.
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).
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 tradeoffs identified in the design process.
Interaction of Technology and Humans	
8.2.5.ITH.1	Explain how societal needs and wants influence the development and function of a product and a system.
8.2.5.ITH.2	Evaluate how well a new tool has met its intended purpose and identify any shortcomings it might have.
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.

Nature of Technology	
8.2.5.NT.1	Troubleshoot a product that has stopped working and brainstorm ideas to correct the problem.
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.

Effects of Technology on the Natural World	
8.2.5.ETW.1	Describe how resources such as material, energy, information, time, tools, people, and capital are used in products or systems.
8.2.5.ETW.2	Describe ways that various technologies are used to reduce improper use of resources.
8.2.5.ETW.3	Explain why human-designed systems, products, and environments need to be constantly monitored, maintained, and improved.
8.2.5.ETW.4	Explain the impact that resources, such as energy and materials used to develop technology, have on the environment.
8.2.5.ETW.5	Identify the impact of a specific technology on the environment and determine what can be done to increase positive effects and to reduce any negative effects, such as climate change

Ethics and Culture	
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.

Instructional Focus

Enduring Understandings: *Students will understand that...*	**Essential Questions:**
EU 3.A: Adapting critical thinking around a given problem and considering the effects produced by changing different variables can solve problems. EU 3.B: Technology that has made the way people live easier or has led to a new business or career, has had an impact on the environment such as the energy used to develop the technology.	How do I alter the process (EDP) to attain a solution to best fit the problem? How could technology and design affect society positively or negatively? How do engineers solve global problems when factors are in constant progression and designs are influenced by products and systems?

EU 3.C: Factors such as (resources, criteria, desired features, constraints) influence the development and function of products and systems.	

Evidence of Learning (Assessments)

PERFORMANCE ASSESSMENT(S) G.R.A.S.P.S
Students will show that they really understand by evidence of…

Option 1: Hurricane house
Goal: Understand the forces of nature that can affect the stability of a structure.
Role: Engineer
Audience: Peers and teacher
Situation: Design a prototype house that can withstand hurricane force winds.
Product: Effective and persuasive presentation of data and information.
Standards and Criteria: You must test and present your prototype, record observations in a journal. Complete the observation rubric.

Option 2: Recycled Projects
Goal: Your goal is to design and create a useful and innovative product using recycled materials that addresses a specific environmental issue or contributes to sustainability.

Role: You are a young environmental engineer tasked with designing a product that utilizes recycled materials to solve a real-world environmental problem.

Audience: Your audience includes your classmates, teachers, and potentially local community members interested in sustainability and environmental conservation.

Situation: The world faces numerous environmental challenges such as plastic pollution, waste accumulation, or energy consumption. As young environmental engineers, you have been assigned the task of creating a product that tackles one of these issues by repurposing recyclable materials.

Product/Performance: Create a product using recycled materials that effectively addresses the chosen environmental issue. Your product should be practical, innovative, and demonstrate your understanding of sustainability. Present your product to the class through a short presentation (3-5 minutes) explaining the environmental issue it addresses, the materials used, and how your product contributes to a more sustainable future.

Standards/Criteria:
Your project will be evaluated based on the following criteria:
  Environmental Impact: How effectively does your product address the chosen environmental issue? Does it contribute positively to sustainability?
  Innovation and Creativity: Does your product show innovation in its design and use of recycled materials?
  Functionality: Is your product useful and practical in addressing the environmental issue it targets?
  Presentation Skills: How clearly and confidently do you present your product and its environmental purpose to the audience?

Teaching resources: PepsiCo Recycle Rally

Objectives (SLO)

ESSENTIAL KNOWLEDGE (EK) *Students will know…*	LEARNING OBJECTIVES (LO) *Students will be skilled at…*
EK 3.A ● Environmental issues and natural disasters require engineers to reflect on designs and modify structures. EK 3.B ● Improvement in science impacts technologies, and the way we analyze that technology has contributed to or reduced inequities in local and global communities. EK 3.C ● Products and Systems ○ Resources ○ Criteria ○ Desired Features ○ Constraints ● Continually refining their designs to minimise use of materials, engineers must try to fit their designs into the environment harmoniously and with minimum disruption or degradation of natural ecosystems.	LO 3.A.1: Research to learn more about environmental issues and natural disasters (such as hurricanes), and their effects. LO 3.A.2: Use area to determine structure stability in various real-world conditions. LO 3.A.3: Create a prototype of a product. L.O. 3.B.1: Use media and available resources to track trends in environmental issues. LO 3.C.1: Reflect on how to improve a product. LO 3.C.2: Incorporate environmental considerations as an inherent and inseparable part of the design process.

Suggested Lesson Resources/Technology Tools

3.A.   SUGGESTED TIMEFRAME: 3-4 class periods

Hurricanes option:

● The origin of hurricanes. How are they formed? What are the processes that lead to their formation? Make a detailed description of these and help your classmates understand.
● Present the five deadliest hurricanes in the history of the USA. Katrina is just one of them, talk to your class about the others and point out the differences and similarities.
● Economic damage of Hurricane Katrina.
● Survival kit. Especially in the following months of the tragedy the authorities tried to educate the population about having a survival kit. A backpack filled with food and essential objects can save your life. Discuss about what objects you should have in your kit.
● Reconstruction. The government and other countries became actively involved in the reconstruction after the crisis passed. Their efforts paid off, and they could rebuild cities in just a matter of months.
● Hurricane Model
● Mystery Science extended research

Recycled Projects option:

● The engineering design process and its application in creating recycled projects.

- Analyze the environmental impact of recycling and repurposing materials.

3.B.　　　　　　　SUGGESTED TIMEFRAME:　3-4 class periods

Hurricane House option:

- Engineering Design Process to create hurricane-safe structure
- Using research and knowledge of materials and design to create a structure that will withstand the wind speed of a leaf blower at various distances to simulate Hurricane categories (tropical storm-Category 5)
- Video of Hurricane House Project
- Hurricane House Parameters pdf

Recycled Projects option:

Lesson 1: Introduction to Engineering Design, Recycling, and Climate Action
- Introduce the engineering design process using examples that highlight climate-related challenges.
- Discuss the importance of recycling in reducing waste and its positive impact on mitigating climate change.
- Show examples of recycled projects designed to address environmental issues, such as reducing plastic waste.
Lesson 2: Brainstorming and Ideation for Climate-Conscious Projects
- Facilitate a brainstorming session focused on creating projects that contribute to climate action.
- Encourage students to sketch and describe their proposed projects using recycled materials, emphasizing their environmental benefits.
- Provide examples and guidance to help students think innovatively about climate-related solutions.
Lesson 3: Planning and Design with Climate Impact in Mind
- Guide students in developing detailed plans for their chosen climate-conscious project, considering materials needed and the potential environmental impact.
- Emphasize the use of recycled materials and their suitability for the intended project's eco-friendly purpose.
- Assist students in creating sketches or diagrams that highlight the environmental benefits of their designs.

3.C.　　　　　　　SUGGESTED TIMEFRAME:　3-4 class periods

Hurricane House option:

- Students can come up with a list of different technologies that relate to hurricane protection.
- Have them write down their ideas and how they could be used to protect people in the event of hurricanes..
- What other designs have engineers used to prevent emergencies (For example, in San Francisco, engineers design buildings to meet earthquake codes.)
- Levees for protecting against flooding
- Boats to rescue people during floods
- Meet SlothBot: the cutest robot fighting climate change | CNN

Recycled Projects option:

Lesson 4-5: Construction Phase for Climate Solutions
- Provide students with recycled materials collected from home or brought in by students.
- Offer guidance and supervision as students begin constructing their projects, focusing on the eco-friendly aspects.
- Encourage teamwork and problem-solving as students work on creating their climate-conscious designs.
Lesson 6-8: Presentation and Reflection on Climate Impact
- Have students present their completed projects to the class, emphasizing the climate action aspect of their designs.

- Discuss the functionality, creativity, and positive environmental impact of each project.
- Encourage reflection on how these projects contribute to mitigating climate change and reducing waste.

Modifications

Special Education
- Students' personal device used to log in and access websites
- Flexible seating arrangements, and movement breaks
- Call student name before asking a question
- Extend wait time after asking question
- Scaffolded instructions
- Sensory modifications
- Frequent check-ins
- Extended time or modified assignments, such as less constraints on design projects

ELL
- Spanish/multilingual book section of library
- Translated materials
- Visual aids
- Opportunites for language practice in groups, language buddies

Gifted and Talented
- Modified assignments, such as more constraints on Design projects

504
- Preferential seating
- Accessible materials, as per student needs (large print, audio, digital texts, etc.)
- Behavior management support, movement breaks
- Provide a quiet space, if necessary, to minimize distractions
- Accessible materials, as per student needs (large print, audio, digital texts, etc.)
- Frequent check-ins
- Extended time or modified assignments

Virtual
- Utilize online learning platforms (i.e., Google Meet and Schoology) to meet with students virtually, with the goal of introductions and "get-to-know-you" as well as establishing routines/expectations for remote-virtual learning specific to library media.
- Virtual read-alouds, demonstrations, and discussions about library media.
- The students can watch the Architecture Adventure Crash Course video, reflect and fill out their EDP journal with a tree house sketch Architecture Adventure: Crash Course Kids #47.2

Career Readiness, Life Literacies, and Key Skills Practices

Please select all career readiness, life literacies, and key skills practices that apply to this unit of study:
- ❏ Act as a responsible and contributing community member and employee.
- ❏ Attend to financial well-being.
- ✓ Consider the environmental, social, and economic impacts of decisions.
- ✓ Demonstrate creativity and innovation.
- ✓ Utilize critical thinking to make sense of problems and persevere in solving them.
- ❏ Model integrity, ethical leadership, and effective management.
- ❏ Plan education and career paths aligned to personal goals.

- ✓ Use technology to enhance productivity, increase collaboration and communicate effectively.
- ✓ Work productively in teams while using cultural/global competence.

For more information: New Jersey Student Learning Standards - Career Readiness, Life Literacies, and Key Skills (pages 15-16)