Inquiry Project Design Plan

Teacher/Designer Names: Patricia Ackerman	
Name of Project:	**Grade Level: 5**
Est Launch Date: November 28, 2022	**Est Duration (in weeks): 4**
Disciplines Involved: ELA, Science, Social Studies, Art	
Problem Statement : Throughout history, people have improved society, we can notice problems in our lives that do not have solutions.	

STAGE 1: DESIRED RESULTS

Big Idea: Technology Innovations

Enduring Understandings:

- Technology has played a role in past, present, future
- Technology has impacted our community
- Technology is used as a tool to solve real world problems.

Essential Question(s):
(MEANT TO BE SHARED WITH STUDENTS)

- How does technology impact people's lives?

  To what extent do our diverse experiences create different ways to value the same things?

Established Goals (Standards, Performance Indicators, Learning Goals):
*choose relevant standards to unit/project plan timing and learning goals; do not need to use all disciplines below.
** unpack into SWK and SWBAT under identified standards as this will lead to aligned assessment design

Science Standards:

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-ETS1-3. 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

SWK

- Identify a real world problem that reflects a need or a want
- Know how the technology they design will solve the problem

SWBAT

- Work with their peers to design and improve solutions to a problem
- Design a solution to their problem
- Explain how their design solves the problem

Social Studies Standards:

5.7b Peoples of the Western Hemisphere have engaged in a variety of economic activities to meet their needs and wants.
Students will examine why certain products are manufactured in particular places, taking into account the weight, transportation availability, and costs and markets (e.g., soda pop).

Inquiry Project Design Plan

SWK

- Know technological innovations from the Age of Exploration.
- Recognize why innovations were/are manufactured

SWBAT

- ∉ Choose one innovation to show its impact on the real world

Mathematics Standards:

NY-5.MD 1. Convert among different-sized standard measurement units within a given measurement system when the conversion factor is given. Use these conversions in solving multi-step, real world problems

SWK

- Know the standard unit of measure (inches, feet, miles)

SWBAT

- Convert standard unit of measurement
- Use a uniform unit of measurement when constructing their designs

ELA Standards:

ELA RI.5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
W.5.6 With some guidance and support from adults, 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.
W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

SWK

- How to access reliable and credible information from the internet or other sources
- How to form phrases, sentences, and/or paragraphs
- Synthesis information from several sources

SWBAT

- ∉ Research technological innovations from the Age of Exploration.
- ∉ Annotate from sources to determine important information that relate to real world problems

SL.5.4 Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.
SL.5.5 Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.

SWK

- Facts and information from their research

SWBAT

Inquiry Project Design Plan

- ∉ Research and present technological innovations from the Age of Exploration
- ∉ Use their chosen form of expression to present their findings to the audience (writing, oral, video, etc)
- ∉ Evaluate presentations for strength of evidence and conclusions.

Technology Standards:

NYS Computer Science:

4-6.IC.1 Describe computing technologies that have changed the world, and express how those technologies influence, and are influenced by, cultural practices.
4-6.DL.1 Type on a keyboard while demonstrating proper keyboarding technique.
4-6.DL.2 Select appropriate digital tools to communicate and collaborate while learning with others.
4-6.DL.3 Conduct and refine advanced multicriteria digital searches to locate content relevant to varied learning goals.

SWK

- Facts and information from their research
- Know how to use various technological devices
- Know appropriate listening and speaking strategies in a group setting

SWBAT

- Link connections between technology and real world problems
- Use technology to research innovations from the Age of Exploration
- Present findings using appropriate digital tools

ISTE:

1.4 Innovative Designer
Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.

SWK

- Know how to use various technological devices
- Identify a real world problem that reflects a need or a want
- Know how the technology they design will solve the problem

SWBAT

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- ∉ Create technological innovations in the real world.

Social Justice Standards:

Justice 14 JU.3-5.14 I know that life is easier for some people and harder for others based on who they are and where they were born.

SWK

- Real world problems within their communities (classroom, neighorhood
- How people can react differently to these problems
- Know the elements of accountable talk

SWBAT

- Have respectful conversations regarding others' opinions, challenges, and thoughts

Inquiry Project Design Plan

Other (Art, SEL, etc):

SEL:
2C.2b. Analyze ways to work effectively in groups
2D.2b. Apply constructive approaches in resolving conflicts.
3B.2b. Generate alternative solutions and evaluate their consequences for a range of academic and social situations

SWK

- Know appropriate listening and speaking strategies in a group setting
- Know the elements of accountable talk

SWBAT

- Evaluate successes and failures during group work.
- Use questioning and response strategies within their group

Links to Standards/Reference Frameworks:
NGSS, NGSS by DCI Nat'l C3 SS Framework, NYS K-8 SS Standards, Common Core, ISTE, Learning for Justice Social Justice Standards, CASEL SEL Framework, NYS CS and Digital Fluency

STAGE 2: EVIDENCE & ASSESSMENTS:

Performance Task

Goal: *Provide a statement of the task. Establish the goal, problem, challenge, or obstacle in the task.*

The goal of this performance task is for students to use technology to solve a real world problem within their community. Students will utilize technology to research, present findings, plan, and design their solution.

Role: *Define the role of the students in the task. State the job of the students for the task.*

Designers, Researchers, Presenters, Problem Solvers, Mathematicians, Scientists, Authors, Storytellers

Audience: *Identify the target audience within the context of the scenario.*

Fellow Designers (classmates)

Situation: *Set the context of the scenario. Define the narrative.*

Throughout history, people have been improving their daily lives using technology. Technological innovations from the Age of Exploration will be examined to provide prior knowledge on ways technology solves real world problems. Through understanding the impact of technological innovations of the past (Eli Whitney's Cotton Gin, The Empire State Building's elevator, and Henry Ford's conveyor belt), we can make connection to problems within our community. Though technology is an integral part of our daily lives, we can still find ways to make life more efficient.

Product(s): *Clarify what the students will create and why they will create it*
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- Students will present their findings from the Age of Exploration research
- Students will design an innovation of their own creation which solves a real world

Inquiry Project Design Plan

problem using a digital resource (DASH, tablet, drone, etc)

Standards (criteria for success): *Provide students with a clear picture of success. Identify specific standards for success.*

- ❑ Research one invention from the Age of Exploration (Eli Whitney's Cotton Gin, The Empire State Building's elevator, or Henry Ford's conveyor belt)
- ❑ Present findings from research using a digital resource of their choice
- ❑ Recognize real world problems within their community
- ❑ Plan and design innovation to solve the problem
- ❑ Measure cafeteria using standard units of measurement
- ❑ Use measurement conversions to represent innovation
- ❑ Explain how innovation will help solve the problem
- ❑ Use technology appropriately
- ❑ Be respectful with peers when working in partnerships/groups

Performance Task Narrative:

Entrepreneur
(consider other ways to 'prime the pump' of student learning)

Other Evidence/Assessments:

- ∉ Rubrics
- ∉ Checks for Understanding
- ∉ Formative assessments based on included standards

STAGE 3: THE LEARNING PLAN:

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Learning Activities

(potential layout below. Can be daily, divided by periods, or even using the Engineering Design Process to divide into stages such as Ask, Imagine, Plan, Create, Improve)

Week 1

Learning Goals:

Students will gain prior knowledge on technology's impact on daily lives by studying innovations from the Age of Exploration

Learning Events:

- Read and discuss innovations during the Age of Exploration (using Benchmark Steps to Advance curriculum)
- Choose an innovation from Age of Exploration (Eli Whitney's Cotton Gin, The Empire State Building's elevator, or Henry Ford's conveyor belt) to research impact on

Formative Assessments:

- Use Padlet to as a "check-in" to assess understanding of Age of Exploration innovations' impacts on society
    - Criteria: use at least 3 content vocabulary words within explanation, include at least 1 way innovation was impactful
- Exit Tickets for ELA comprehension following reading from Benchmark Steps to Advance curriculum (timeline, summary, etc).

Notes/Resources:
Do Now having students understand the urgency/need of innovation
Have student document their 'feelings' when they are unable to use technology (and reflect upon this throughout the unit)

Week 2

Learning Goals:

In small groups, students will gather information about an invention from the Age of Exploration and present findings using a storytelling format and digital tool of their choice.

Learning Events:

- Research chosen innovation from Age of Exploration
- Plan, draft, edit, revise, and present research findings using a digital tool of their choice
- Use "Critical Friends Protocol" to provide peer feedback following presentations

Inquiry Project Design Plan

Formative Assessments:

- Observations during research
- Student self-assessment checklist for writing process
- Observations during peer feedback
    - Criteria: properly use at least 1 technique from "Critical Friends Protocol"

Notes/Resources:

Some using technology some not so students get the feel of technology
Have student document their 'feelings' when they are unable to use technology (and reflect upon this throughout the unit)

Week 3

Learning Goals:

- Students will choose a real world problem within their community that can be improved using technology
- Students will design an innovation to solve their real world problem and present their innovation using storytelling.

Learning Events:

- Use Menti to poll students' thoughts about impact of technology within their lives and discuss data
- Individually reflect on real world problems within their community
- Collaboratively discuss and share reflections within groups using a digital tool (Padlet)
- Choose a problem to solve using technology
- Begin designing your innovation
- Use technology to better understand the problem in their community (utilize Drone and/or Dash)

Formative Assessments:

- Observation of group discussions during reflections
- Padlet Reflections
    - Criteria: list and describe a real world problem within community using at least 2 sentences

Notes/Resources:
Start planning innovation day – have students work in pairs

Week 4

Inquiry Project Design Plan

Learning Goals:

- Students will present their innovation to the class using storytelling.

Learning Events:

- Use technology (DASH, drone, laptop, PowerPoint) during presentation
- Use "Critical Friends Protocol" to provide peer feedback following presentations

Formative Assessments:

- Use Menti to comment on each innovation