STEM Unit- Grade 2

Content Area: **STEM**
Course(s): **Generic Course, General Development 2**
Time Period: **1 marking period**
Length: **Length of unit**
Status: **Published**

Unit Overview

Students in this program use hands-on lessons to learn key concepts about engineering, design, invention, and innovation and the roles they play in creating technological systems to help make life easier and better. Students learn to apply and transfer this knowledge to common, everyday problems. Students learn how to evaluate technology, its impacts and resulting issues, and present the positive and negative consequences and how these have shaped today's global society. The program incorporates the applications of technology, engineering, mathematics, and science concepts and provides a strong background for students investigating careers in all career-focused academies.

Transfer

Students will be able to independently use their learning to...

-What kinds of long term, independent accomplilshments are desired?

1. Technology has benefits and consequences.
2. Engineering design is a creative process, which may result in new inventions and innovations.
3. A technological world requires that humans develop capabilities to solve technological challenges and improve products for the way we live.
4. Science uses different types of investigations to answer questions about the natural world.
5. Science and engineering are interrelated, in which science is concerned with the natural world and engineering with the human-made world
6. Some questions can be answered by collecting, representing, and analyzing data.
7. Information to gain or expand knowledge can be acquired through a variety of sources.
8. Writing is a process that conveys and documents ideas, thoughts, and opinions.

Meaning

Understandings

Students will understand that...

-What specifically do you want students to understand?

-What inferences should they make/grasp/realize?

- the differences between scientists and engineers

-the steps in the scientific method and the engineering design method

-think outside the box to solve problems

-working collaboratively is important

-there are different solutions to solve a problem.

-a solution can be improved upon.

-its ok to fail

Essential Questions

Students will keep considering...

-What thought provoking questions will foster inquiry, meaning making and transfer?

-What is an engineer?

-How does a scientist conduct an experiment?

-Have you ever built something?

-What steps go into building something?

Application of Knowledge and Skill

Students will know...

Students will know...

What facts and basic concepts should students know and be able to recall?

-Steps in the scientific method

-Steps in the engineering design process

-how to record observations

-how to combine ideas in a group setting

-how to make appropriate revisions to an idea

-problem solve collaboratively

Students will be skilled at...

Students will be skilled at...

What discrete skills and processes should students be able to use?

-following the scientific method and engineering design process

-Working collaboratively

-oral presenations

-defend a position

-use tools to complete tasks

-think outside the box

Academic Vocabulary

hypothesis

problem

observe

analyse

data

record

conclusion

solution

present

argue

debate

share

measure

balance

volume

mass

length

create

invent

revise

innovate

design

test

diagram

label

journal

brainstorm

document

LEARNING GOAL 1

Design a solution to an engineering problem and conduct a scientific investigation.

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
SCI.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.
SCI.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.
SCI.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.
TECH.8.1.5.B	Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
TECH.8.2.5.C.6	Examine a malfunctioning tool and identify the process to troubleshoot and present options to repair the tool.
K-2-ETS1-2	Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.
K-2-ETS1-3.ETS1.C.1	Because there is always more than one possible solution to a problem, it is useful to compare and test designs.

Target 1

Students identify and describe the relationships between engineering and science.

Target 2

Students compare and contrast science, as a way of answering questions and explaining the natural world, and engineering, as a way of inventing tools and techniques to solve human problems.

Target 3

Students design, conduct, and/or describe the steps of an engineering challenge or experiment to test one

variable.

Target 4

Students analyze data to form and defend a conclusion.

Summative Assessment

STEM notebook

21st Century Life and Careers

Select all applicable standards from the applicable standards

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Formative Assessment and Performance Opportunities

Think-Pair-Share

3-2-1 Reflection

Exit Ticket

Teacher Observation

STEM notebook

Quick-writes

graphic organizer

oral presentation

class participation

Differentiation/Enrichment

As this is a TAG class, rigor is already increased. Students have the opportunity to particpate in:

self-directed research

poetry, art, and writing compeition

Unit Resources