# Unit 1 - Introduction to STEM and the Design Process

Content Area: **Technology**
Course(s): **Technology 3**
Time Period: **September**
Length: **8 Classes**
Status: **Published**

## Unit Overview

This unit will take approximately 8 classes.

Vocabulary for this unit includes: Growth / Fixed Mindset, Prototype, Design Process, Peer, Utilize, Design

## Priority Standards

| | |
|---|---|
| CS.3-5.8.2.5.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. |
| CS.3-5.8.2.5.ED.3 | Follow step by step directions to assemble a product or solve a problem, using appropriate tools to accomplish the task. |

## Essential Questions

- How can a prototype help to improve my final product?
- How can I develop my own idea and communicate it to others?
- How can I express my idea so it can be used to solve a problem?
- How can I use what I've learned in this unit to complete tasks efficiently?
- How can I utilize a peer to help me achieve a goal?
- How does failure help to achieve success?

## Unit Learning Goals

- SWBAT design and create a prototype
- SWBAT order and describe the function and purpose of each step of the design process.
- SWBAT sort and defend examples of whether a mindset is classified as growth or fixed.
- SWBAT utilize a prototype to create a final copy of their project.

## Unit Learning Targets

- I can design and create a prototype of my pop-up card.

- I can identify and defend a mindset as either growth or fixed.
- I can order and describe the function of each step of the design process.
- I can utilize my prototype to help me to create a final copy of my pop-up card.

## Marzano Elements

- Establishing & Acknowledging Adherence to Rules & Procedures
- Establishing & Maintaining Effective Relationships in a Student Centered Classroom.
- Helping Students Engage in Cognitively Complex Tasks
- Helping Students Examine their Reasoning
- Helping Students Practice Strategies, Skills, & Processes
- Helping Students Process New Content
- Helping Students Revise Knowledge
- Using Formative Assessment to Track Progress

## Strategies for Differentiating Instruction

- Encourage more complex designs for more advanced students
- Group lower functioning students with student helpers.
- More advanced students can create additional cards and/or assist other students with their designs.
- Provide physical and/or verbal assistance for students who have difficulty interpreting or planning their card.

## Unit Assessments (Required)

- Assessment of prototype
- Assessment of final card
- Assessment of design process understanding

## Unit Assessments (Optional)

- Growth/Fixed Mindset evaluation

## Unit Learning Goals / Targets / Plans

| | Lesson / Activity | Standard / Learning Goal / Target |
|---|---|---|

| | | |
|---|---|---|
| M and set | Class introduction with discussion of Growth and Fixed Mindset. | **Standard**: **CS.3-5.8.2.5.ED.2** - Collaborate with peers to collect info solve a problem, and evaluate all possible solutions to provide the be sketches or models.<br><br>**Learning Goal**: SWBAT sort and defend examples of whether a mir growth or fixed.<br><br>**Learning Target**: I can identify and defend a mindset as either grow |
| | Cooperative cup lifting activity | **Standard: CS.3-5.8.2.5.ED.2-** Collaborate with peers to collect info solve a problem, and evaluate all possible solutions to provide the be sketches or models.<br><br>**Learning Goal**: SWBAT work with a peer(s) to cooperatively solve<br><br>**Learning Target**: I can work with my peer(s) to solve a problem. |
| | The Design Process | **Standard**: **CS.3-5.8.2.5.ED.2** - Collaborate with peers to collect info solve a problem, and evaluate all possible solutions to provide the be sketches or models.<br><br>**Learning Goal**: SWBAT order and describe the function and purpos design process<br><br>**Learning Target**: I can order and describe the function of each step |
| Pop-Up | Introduction pop-up card project; creation of a prototype | **Standard: CS.3-5.8.2.5.ED.2-** Collaborate with peers to collect info solve a problem, and evaluate all possible solutions to provide the be sketches or models.<br><br>**Learning Goal**: SWBAT design and create a prototype.<br><br>**Learning Target**: I can design and create a prototype of my pop-up |
| Up | Utilize a prototype to create a final copy of a pop=up card | **Standard**: **CS.3-5.8.2.5.ED.3** - Follow step by step directions to asse problem, using appropriate tools to accomplish the task. |

| | | |
|---|---|---|
| | | **Learning Goal**: SWBAT utilize a prototype to create a final copy of<br><br>**Learning Target**: I can utilize my prototype to help me to create a fi card. |

## Technology Integtation

Please reference priority standards listed above.

## Cross Curricular Connections

- 3.G.A  Reason with shapes and their attributes.
- 3.MD.C  Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- 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.

## 21st Century Life and Career Readiness Practices

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP12. Work productively in teams while using cultural global competence.
- CRP4. Communicate clearly and effectively and with reason.
- CRP6. Demonstrate creativity and innovation.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

## Materials and Resources

Google Docs

Google Classroom

GoGuardian

Pop-Up Card Project

Cup Stacking Activity

Cup Stacking Activity Video

Famous Failures Video