Unit 3 - Constraints with the Design Process - Rockets

Content Area: **Technology**
Course(s): **Technology 4**
Time Period: **March**
Length: **8 Classes**
Status: **Published**

Unit Overview

This unit will take approximately 8 classes.

Vocabulary for this unit includes: constraint, budget, prototype, prediction, reflection

Priority Standards

CS.3-5.8.2.5.ED.4	Explain factors that influence the development and function of products and systems (e.g., resources, criteria, desired features, constraints).
CS.3-5.8.2.5.ED.6	Evaluate and test alternative solutions to a problem using the constraints and trade-offs identified in the design process.

Essential Questions

- How can a plan/proposal keep me on track?
- How can air propel an object?
- How can constraints affect the outcome of my plan?
- What role can prediction and reflection plan in the design process?

Unit Learning Goals

- SWBAT develop a mission proposal, budget and objective based off of information and resources provided
- SWBAT explain and discuss the scope and goals of the rocket project.
- SWBAT manage, time, resources, and peer interaction to construct a rocket.
- SWBAT predict and reflect on the outcomes of their rocket launch.

Unit Learning Targets

- I can construct a rocket with my peer while taking into account time and other resources.
- I can describe the details and expectations of the rocket project.
- I can develop a basic mission plan including a prototype and budget.
- I can predict ad reflect on the successes and failures of my rocket with supporting evidence.

Marzano Elements

- 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
- Organizing Students to Interact with Contact
- Previewing New Content
- Providing Feedback & Celebrating Success

Strategies for Differentiating Instruction

- Wave consultation and/or labor fee for special needs students as needed.
- Alter mission proposal as needed for students (Provide less or more detail as student's ability allows)
- Pair up stronger students with students who need assistance.
- Have more advenced students add more complex features to their rockets and illustrations.

Unit Assessments (Required)

- Mission Proposal Evaluation
- Physical Rocket Evaluation
- Prediction / Reflection Evaluation

Unit Assessments (Optional)

None

Unit Learning Goals / Targets / Plans

Class	Topic	Lesson / Activity	Standard / Learning Goal / Target
1	Introduction to Rocket Project	Rocket Project Discussion	**Standard**: **CS.3-5.8.2.5.ED.4 -** Explain of products and systems (e.g., resources, c **Learning Goal**: SWBAT explain and disc **Learning Target**: I can describe the detai
2	Mission Report and Prototype	Development of a Mission Plan	**Standard**: **CS.3-5.8.2.5.ED.4 -** Explain of products and systems (e.g., resources, c **Learning Goal**: SWBAT develop a missi information and resources provided **Learning Target**: I can develop a basic m
3-7	Project Management / Construction of Rocket	Construction of Rocket within constraints	**Standard**: **CS.3-5.8.2.5.ED.6 -** Evaluate a constraints and trade-offs identified in the **Learning Goal**: SWBAT manage, time, r **Learning Target**: I can construct a rocke other resources.
8	Predict / Launch / Reflect	Launch of Rocket with predictions and reflections	**Standard**: **CS.3-5.8.2.5.ED.4 -** Explain of products and systems (e.g., resources, c **Learning Goal**: SWBAT predict and refl **Learning Target**: I can predict ad reflect supporting evidence.

Cross Curricular Connections

- 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.
- 4.MD.A Convert like measurement units within a given measurement system.
- 4.MD.C Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.

21st Century Themes

For this unit, students will work on the following 21st century themes:

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- 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.
- CRP9. Model integrity, ethical leadership and effective management.
- CRP12. Work productively in teams while using cultural global competence.

Materials and Resources

Google Classroom

Google Docs

Rocket Launch Video