

# 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

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This unit will take approximately 8 classes.

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

## Priority Standards

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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

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- 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 play in the design process?

## Unit Learning Goals

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- 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

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- 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 and reflect on the successes and failures of my rocket with supporting evidence.

## **Marzano Elements**

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- 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 Content
- Previewing New Content
- Providing Feedback & Celebrating Success

## **Strategies for Differentiating Instruction**

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- 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 advanced students add more complex features to their rockets and illustrations.

## **Unit Assessments (Required)**

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

## **Unit Assessments (Optional)**

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None

## **Unit Learning Goals / Targets / Plans**

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

## **Cross Curricular Connections**

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- 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**

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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**

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[Google Classroom](#)

[Google Docs](#)

[Rocket Launch Video](#)