UNIT 5 SPACE FLIGHT

Content Area: **Technology**
Course(s):
Time Period: **May**
Length: **4 Days**
Status: **Published**

Unit Overview

Students will design and build both virtual and real-life rockets. As an introduction, students will learn how rockets work, and then move on to designing and building a soda bottle rocket using basic materials. Students then launch the rockets, collecting data on both time of flight and distance travelled. This data is then compiled and visualized in graph form, and students draw various conclusions from the data.

In the STEM lab, students will use their new knowledge of rocket design to build a virtual rocket in the Kerbal Space Program software. Students will then fly their creations, attempting to reach orbit. Concepts discussed include periapsis, apoapsis, orbital speed vs ground speed, and altitude. Students use the instrumentation in the program to fly their virtual rockets, using the data feedback to make correction in their flight profile. Students then refine their rockets as needed to achieve orbit.

Standards

- 8.1.8.CS.2: Design a system that combines hardware and software components to process data.
- 8.1.8.CS.3: Justify design decisions and explain potential system trade-offs.
- 8.1.8.IC.1: Compare the trade-offs associated with computing technologies that affect individual's everyday activities and career options.
- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- 8.1.8.DA.3: Identify the appropriate tool to access data based on its file format
- 8.1.8.AP.6: Refine a solution that meets users' needs by incorporating feedback from team members and users.
- 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.
- 8.2.8.ED.4: Investigate a malfunctioning system, identify its impact, and explain the step-by-step process used to troubleshoot, evaluate, and test options to repair the product in a collaborative team.
- 8.2.8.ED.5: Explain the need for optimization in a design process.
- 8.2.8.ED.6: Analyze how trade-offs can impact the design of a product.
- 8.2.8.ED.7: Design a product to address a real-world problem and document the iterative design process, including decisions made as a result of specific constraints and trade-offs (e.g., annotated sketches).
- 8.2.8.NT.1: Examine a malfunctioning tool, product, or system and propose solutions to the problem.

Materials

- Laptops

Assessment

Formative Assessment

- Teacher Observation
- Checks for Understanding
- Exit Tickets

Summative Assessment

- Performance Tasks & Projects

Accommodations & Modifications

Special Education

- Follow IEP Plan which may contain some of the following examples…
- In class/pull out support with special ed teacher or assistant
- Preferred seating
- Directions repeated/clarified
- Extended time for completing tasks
- Vocabulary support
- Limit number of tasks

504

- In class/pull out support with special ed teacher or assistant
- Preferred seating
- Directions repeated/clarified
- Extended time for completing tasks
- Vocabulary support
- Limit number of tasks

ELL

- Translation device/dictionary
- Preferred seating
- Directions repeated/clarified
- Extended time for completing tasks
- Vocabulary support
- Limit number of tasks

At-risk of Failure

- Preferred seating
- Directions repeated/clarified
- Extended time for completing tasks
- Vocabulary support
- Limit number of tasks

Gifted & Talented

- Independent projects
- Online games
- Extension activities

Interdisciplinary Connections

	Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific ideas, principles, and theories.
ETS1.A	Defining and Delimiting an Engineering Problem
	Planning and Carrying Out Investigations
	Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions.

21st Century Life Literacies & Key Skills

9.4.8.CI.2	Repurpose an existing resource in an innovative way (e.g., 8.2.8.NT.3).
9.4.8.CI.3	Examine challenges that may exist in the adoption of new ideas (e.g., 2.1.8.SSH, 6.1.8.CivicsPD.2).