Unit 6: Airfoil Design and Flight

Content Area: **Applied Technology**
Course(s):
Time Period: **Marking Period 1**
Length: **10 Days**
Status: **Published**

Summary

Students will design and build a foam wing glider and/or paper airplanes. They will learn about the history of flight and how man has conquered the skies. Students will be introduced to the science of aeronautics and the basic principles behind flight.

Revision Date: July 2021

Essential Questions/Enduring Understanding

Essential Question:

How has flight changed the world?

What makes an airplane fly?

How does the shape of an airfoil change the performance of the airplane?

Enduring Understanding

Flight is another way that technology has made the world we live in "smaller".

Objectives

Students will know the history of flight starting with the Wright Brothers.

Students will know how the principles of flight, such as lift, thrust, drag, and gravity affect flight performance.

Students will know about the NACA (National Advisory Committee for Aeronautics) formula for airfoil design and how to use it.

Students will know the basic vocabulary of airplanes and airfoil design.

Students will be skilled at how to identify a technical problem and use the design process to create an appropriate solution.

Students will be skilled at create, testing, and modifying prototype paper airplanes.

Students will be skilled at identifying which forces are impacting their design types.

Learning Plan

Vocabulary and Terminology Presentation: Students will work to complete a short presentation on vocabulary and terminology related to airfoil deisgn and flight. Students will first preview the vocabulary and terminology as a class. Presentations will include definitions, imagery, and real world examples of the word.

Leaf Glider Challenge: Students will be tasked to use what they have learned from the vocabulary and terminology presentation to complete this challenge. Students will use paper clips and various sizes ans shapes to create three different types of leaf gliders with specific variables for each. Students will complete a digital portfolio on their work and their findings, including adding images and completing reflection and conclusion questions.

Paper Airplanes Project: Students will complete a final project for the unit in which they will research, predictions, design, test, graph, and complete reflection/conclusion questions on a Google Doc template. This unit will begin with discussion questions for the class, including hypothetical, such as what would happen if a paper airplane was thrown in the vacuum of space? Each student will design three paper airplanes after research best airfoil design. Each paper airplane will be tested a total of three times and averages will be calculated. Students will include photos of their designs in their digital portfolio along with a graph detailing distance among the different airplanes.

Assessment

Formative:

Do Nows

Class discussions

Worksheet

Summative:

Digital portfolio

Benchmark:

Exit tickets

Vocabulary and terminology presentation

Alternative:

Checklists

Verbal discussions

Self assessment

Materials

Chromebook

Projector

YouTube

Google Forms

Google Docs

Google Slides

Paper

Pencil

Rulers

Measuring tape

Meter stick

Paper clips

Various leaves or leaf substitutes (napkins, tissue paper, etc.)

Scissors

Hole puncher

Integrated Accommodation and Modifications, Spec Ed Students, ELL, At-Risk, G&T, 504's

See attached document:

https://docs.google.com/spreadsheets/d/1pzkODxxGOSxESwthnE0jQW8hVfMaZ9ygEBg5QsKBcDA/edit?us

p=sharing