Engineering Endeavor

Grade levels: 6
1 Quarter
Prerequisite: None

Description
Engineering Endeavor is a hands-on, exploratory course where students dive into the engineering design process through engaging, project-based learning. While most lessons center on designing, building, testing, and refining creative solutions, students also develop specific industry-relevant skills such as precise measurement, technical drawing, and introductory 3D CAD modeling. This blend of open-ended projects and targeted skill-building prepares students to think critically, work collaboratively, and approach challenges like real-world engineers.

Why This Course
The 6th grade engineering course provides an introduction to the design process, looking at many facets of engineering through that lens.

Topics of Learning / Units
Unit 1: Introduction to Engineering
In this introductory unit, students explore how engineering, invention, and innovation shape the world around them. Students learn the foundational skills of an engineer, focusing on how to collect accurate data and interpret information to understand technological impacts on society. By the end of the unit, students will be able to communicate how specific innovations have evolved to meet human needs.

Unit 2: Design and Modeling
This unit immerses students in the cyclical nature of the Engineering Design Process to solve complex, real-world problems. Students develop technical communication skills through concept sketching, isometric views, and advanced 3D solid modeling using CAD software. The unit concludes with students building and testing physical prototypes while strictly adhering to industry safety standards and tool procedures.

Unit 3: Science of Technology
Students examine the relationship between natural science and human-made technology by analyzing the history and mechanics of flight. This unit focuses on data interpretation to compare different technological solutions and understand why certain materials or designs are more effective than others. Students will practice refining their designs by making targeted revisions to better meet specific criteria and constraints.

Unit 4: Automation and Robotics
In this unit, students explore the role of automation in modern society by designing and building functional robotic systems. Using hardware like gear trains, sensors, and VEX brains, students learn to differentiate between system inputs, processes, and outputs. The goal is to

successfully program and construct a robot that utilizes feedback loops to perform specific, autonomous tasks.

Unit 5: Flight and Space
This unit challenges students to solve aeronautical engineering problems by investigating the forces of flight, including lift, thrust, and drag. Students analyze how gravity impacts vehicle structure and flight duration, using this data to justify their design choices for rockets or gliders. Through flight testing and evidence-based arguments, students demonstrate a deep understanding of how machines successfully navigate the atmosphere and space.

District Provided Resource(s)

- Project Lead the Way

Required Assessment(s)

- This course does not utilize district-provided assessments

Course Number(s)
106543