



# PHYSICS BY DESIGN WITH PATHWAYS MATH

## MATH AND PHYSICS COURSE FOR 9<sup>TH</sup> GRADE STUDENTS IN THE PATHWAYS PROJECT

### COURSE DESCRIPTION

The course will develop mathematical literacy in algebra and trigonometry and introduce key concepts of physics through a series of open-ended, real-world projects. Student success in developing a final product for each project will hinge on applying concepts of energy, projectile motion, circuits and fluid dynamics while supporting design decisions with right angle trigonometric functions, exponents, error analysis and statistics.

### OBJECTIVES

In this course, students will be able to demonstrate:

**UTILIZATION** of CTE modeling to design and test creations, solutions and innovative ideas.

**UNDERSTANDING** data collection, result evaluation, trend identification and error analysis.

**APPRECIATION** of everyday phenomena driven by principles of physics and explainable by mathematical methods.

**GENERATION** of original questions and scientific investigations.

**SELF-EFFICACY** and a growth mindset with a love of learning.

**MANAGE** large tasks and adhere to deadlines.

**REFLECTION** on work to evaluate and improve upon initial designs and findings, as well as, on the process of learning, development of goal-orientation, and resiliency in learning through mistakes.

**EFFECTIVE COMMUNICATION** of findings through writings and public presentations and collaboration with peers, teachers and subject-matter experts from industry and the community.

**RESEARCH METHODS** beyond what their teacher has explicitly instructed, and the ability to evaluate such sources.