Spotlight Project: *Projectile Motion*

PROJECT OVERVIEW

Name of Project:	Projectile Motion	**Duration:**	2 weeks
Subject/Course:	math (Algebra II/Trigonometry)	**Grade Level:**	11
Other Subject Areas to Be Included:	Physics		

Project Idea Summary of the challenge, investigation, scenario, problem, or issue:	Students work in teams to design and construct a ballistic device that launches an object in a flight path that follows a parabola. They use low cost materials (PVC pipe, plywood, rubber bands, etc.) to build the device, which must be capable of repeated firings. Students use knowledge of quadratic functions in order to hit a target. Each team conducts multiple tests and use the data they record to redesign their device if needed. Students make an oral presentation using PowerPoint slides to summarize their findings.
Driving Question	How can we build a device to launch a projectile, and calculate its motion in order to hit a target?
Content and Skills Standards to be addressed:	**Students will be able to:** • Use two-dimensional equations of motion for projectile motion to calculate initial velocity, time in the air, horizontal distance and maximum height. • Use trigonometry to resolve two-dimensional vectors into its vertical and horizontal components • Graph quadratic equation and find x-intercepts, y-intercepts and vertex • Apply factoring, quadratic formula and graphing calculator to find x-intercepts of a quadratic graph **CA Content Standards** – Algebra II: 8.0, 10.0; Trigonometry: 12.0, 19.0; Physics: 1i, 1j

		T+A	E		T+A	E
21st Century Skills explicitly *taught and assessed* (T+A) or *encouraged* by project work, but not taught or assessed (E):	Collaboration	☒	☐	Other: Critical and Creative Thinking; Problem Solving	☐	☒
	Presentation	☒	☐		☐	☐
	Critical Thinking:	☐	☐		☐	☐

Culminating Products & Performances	**Group:**	Design Proposal Complete Ballistic Device Main Test Report Angles of Elevation Report Oral Presentation	**Presentation Audience:** ☐ Class ☐ School ☐ Community ☐ Experts ☐ Web ☐ Other:_____
	Individual:		