



RADNOR TOWNSHIP SCHOOL DISTRICT Course Overview



Innovation and Design

General Information

Credits: RHS Only
Weighted: N/A
Prerequisite: N/A

Length: Semester
Format: 3 days per cycle
Grade: 8th

Course Description

Innovation and Design is an opportunity for 8th Grade students to expand their technological skills and knowledge that they acquired during Introduction to Technology as a 6th or 7th grader. Like Introduction to Technology, students will learn skills and apply skills to creative and hands on projects and challenges. There will be several focus areas including, Electronics, Computer Aided Drafting and Design (CADD), Prototyping/Modeling, and Tablet/Phone App Development. During the Prototyping activities, students will be using traditional hand and power tools as well as cutting edge rapid prototyping equipment such as a laser engraver and 3-D Printer.

Course Objectives:

Students will:

- apply the design process to design challenges and projects
- use CADD as an advanced design tool
- use a design process to work from a problem to a solution
- identify and use criteria and constraints in a design process
- apply advanced tools and processes to create solutions to problems
- create working drawings and sketches
- measure with an accuracy of 1/8" with a ruler and .005" using dial calipers
- calculate the speed a vehicle is traveling
- modify design solutions based on prototype testing
- calculate current and resistance within basic electrical circuits

Common Assessments:

Required Assessments:

Common Course Assessments:

Design Process Returns – Quiz to make sure that students are up to speed on the steps of the design process.

Measurement Quiz – Dial Caliper use. Make sure they students can measure down to .005" precision.

CO2 Dragster Project- Students design, build and test a wooden CO2 powered dragster for speed while reducing weight and drag.

Phone/MP3 player stand- Students will design using Autodesk Inventor, a stand to prop up a cell phone or ipod/mp3 player to watch videos. The final product can be multiple parts and can be either 3-D printed or laser engraved.

Basic Electrical Circuits- Quiz to assess student understanding of Ohms Law and resistance.

LED Display Project- Student will design a LED lighting set up to illuminate a laser engraved piece of acrylic. The whole display will be on a wooden base that the student will design and cut on the laser engraver.

App Writing Terms: Assess student understanding of terminology associated with app writing.

App Writing Project: Student will propose and design an App for android or iOS formats.

Major Units of Study:

Technology Review

Areas of Technology
Design Process
Measurement – English and Metric
Multiview Sketching
Isometric Sketching
CADD Review

Aerodynamics

Principles of Aerodynamics
CO₂ Dragster Project

CADD Design

Design with purpose.
Phone/mp3 player stand project. (3-D Printer)

Electronics

Electron Flow
Ohms Law
Circuit Design
LED Display Project (Laser Engraver)

Application Development

Introduction to software and design process.
Tutorials and Group design activities.
Independent project (iPad/Android Tablets)

Major Projects in Bold Italics
(Classroom Equipment in Parentheses)

Materials & Texts