

FOLSOM CORDOVA UNIFIED SCHOOL DISTRICT



Product Innovation & Design

Board Approval Date: November 21, 2024	Course Length: 1 Semester
Grading: A-F	Credits: N/A
Proposed Grade Level(s): 6, 7, 8	Subject Area: Elective Elective Area (if applicable): Math
Prerequisite(s): None	Corequisite(s):
CTE Sector/Pathway:	
Intent to Pursue 'A-G' College Prep Status: No	
A-G Course Identifier:	
Graduation Requirement: No	
Course Intent: Program (if applicable):	
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COURSE DESCRIPTION:

The Product Innovation and Design course offers students the opportunity to use the design process to create imaginative solutions for various challenges. Students will be presented with a central issue at the beginning of the course and are encouraged to keep that problem in mind as they progress through the lessons. They acquire and apply techniques for conveying design concepts through drawings, explanations, and three-dimensional models. They also grasp the idea of simulating models to replicate real-world scenarios and collect data for in-depth analysis and insights. Working collaboratively, students identify the specific demands of a design, conduct thorough research on the subject, and involve relevant stakeholders.

DETAILED UNITS OF INSTRUCTION:

Unit Number/Title	Unit Essential Questions	Examples of Formative Assessments	Examples of Summative Assessment
1. Sketching and Measuring	How can you communicate your design ideas to others?	*Create multi-view sketches *Measure objects and dimension sketches	*Object disassembly and documentation
2. 3D Modeling and Fabricating	How can you turn an idea into a real-world prototype?	*Create 3D models from drawings *Create 3D models from objects *Build objects from 3D models	*Create a product to solve a client's problem
3. Creating a Solution	How do you express yourself and your creativity through engineering?	- Create 3D models from drawings - Create 3D models from objects - Build objects from 3D models	*Create a product to showcase student creativity

ESSENTIAL STANDARDS:

<https://www.cde.ca.gov/be/st/ss/documents/ccssmathstandardaug2013.pdf> Middle School NGSS Engineering Design Standards

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impact on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they met the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

MS-ETS1-4 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

RELEVANT STANDARDS AND FRAMEWORKS, CONTENT/PROGRAM SPECIFIC STANDARDS:

Link to Common Core Standards (if applicable):

Educational standards describe what students should know and be able to do in each subject in each grade. In California, the State Board of Education decides on the standards for all students, from kindergarten through high school.

<https://www.cde.ca.gov/be/st/ss/documents/finaelacssstandards.pdf>

<https://www.cde.ca.gov/be/st/ss/documents/ccssmathstandardaug2013.pdf>

Link to Framework (if applicable):

Curriculum frameworks provide guidance for implementing the content standards adopted by the State Board of Education (SBE). Frameworks are developed by the Instructional Quality Commission, formerly known as the Curriculum Development and Supplemental Materials Commission, which also reviews and recommends textbooks and other instructional materials to be adopted by the SBE.

Link to Subject Area Content Standards (if applicable):

Content standards were designed to encourage the highest achievement of every student, by defining the knowledge, concepts, and skills that students should acquire at each grade level.

Product Innovation and Design Pathway D4.0 Apply various two-dimensional (2-D) graphic and/or three-dimensional (3-D) modeling techniques to development concepts. D5.0 Develop the concept into a well-defined product for prototyping. D6.0 Produce a prototype of a product.

Link to Program Content Area Standards (if applicable):

Program Content Area Standards apply to programs such as International Baccalaureate, Advanced Placement, Career and Technical Education, etc.

TEXTBOOKS AND RESOURCE MATERIALS:

Textbooks

Board Approved	Pilot Completion Date (If applicable)	Textbook Title	Author(s)	Publisher	Edition	Date
		<i>N/A</i>				

Other Resource Materials

Teacher created instructional materials.

Supplemental Materials

Board approved supplemental materials (Including but not limited to: Film Clips, Digital Resources, Supplemental texts, DVDs, Programs (Pebble Creek, DBQ, etc.):

N/A