

Curriculum Map Course Title: **Level One Engineering Drawing/Design and CAD**

Revised: April 2008	Measurement & Sketching	Product Design	Intro. Mech. Drawing and Orthographic Projection	Dimensioning	Isometrics
Essential Questions	1.How do we communicate or explain a product idea? 2.Why are accuracy and proper details on a working drawing important? 3.What is the difference between artistic & technical drawing?	1.Why are new products needed or developed? 2.Why is it important to explore various alternatives or forms before producing a final product? 3.What role does engineering play in product design?	1.What is the purpose of a technical drawing/plan? 2. What are the results of inaccurate work? 3.How do you recognize a good drawing/plan?	1. Why do you think we have to follow rules & use proper techniques when dimensioning? 2.What can happen if the plan lacks technique or details?	1. Why do designers/drafters produce pictorials?
Concepts/ Knowledge/ Content	Students will accurately reproduce a variety of different drawings using freehand sketch techniques.	Students will use design process to develop ideas for a new product/solution to a problem, a basic set of plans will be produced and a model may be fabricated. Options include: Desk Organizer Or Personal Interest Organizer	Students will use common drafting tools to produce a variety of basic technical drawings and orthographic projection drawings	Students will use common drafting tools to produce and dimension a variety of basic technical drawings	Using CAD, Students will draw isometric pictorials from given 2-d views
Skills	Sketching straight lines Sketching arcs & circles Measurement/Layout Producing object sketches Conveying ideas w/sketches Orthographic visualization Self assessment	Drawing accurately with common drafting tools. Recognizing line types/uses. Producing quality lineweight Visualization: 2D from 3D Measurement Mathematical layouts Lettering Neatness/organization Self assessment	Drawing accurately with common drafting tools . Recognizing line types/uses. Producing quality lineweight Visualization: 2D from 3D Measurement Mathematical layouts Lettering Neatness/organization Self assessment	Drawing accurately with common drafting tools. Following rules Measurement Mathematical layouts Lettering Neatness/organization Dimensioning linear, radial and angular Self assessment	Operating a computer File management Using CAD Plotting CAD drawings. Centering drawings Orthographic visualization Drawing 3-D from 2-D. Basic Math w/ # conversion
Assessments	Performance assessment drawings, Rubric w/self & teacher evaluation, Measurement activity/quiz	Performance assessment drawings, Peer checking, Rubric w/self & teacher evaluation. Reflection	Performance assessment drawings, Peer checking, Rubric w/self & teacher evaluation. Reflection	Performance assessment drawings, Peer checking, Rubric w/self & teacher evaluation, Quiz	Performance assessment drawings, Peer checking, Rubric w/self & teacher evaluation, Quiz
Standards and Benchmarks	NJ Tech. Lit. 8.1-8.2 NJ Career Ed. 9.1-9.2	NJ Tech. Lit. 8.1-8.2 NJ Career Ed. 9.1-9.2	NJ Tech. Lit. 8.1-8.2 NJ Career Ed. 9.1-9.2	NJ Tech. Lit. 8.1-8.2 NJ Career Ed. 9.1-9.2	NJ Tech. Lit. 8.1-8.2 NJ Career Ed. 9.1-9.2

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Revised: April 2008	Unit Five Intro. to CAD	Design/Problem Solving Project – DC motors...	Design/Problem Solving Project - Crash Safety	Design/Problem Solving Project –Hurricane Shelters	Design/Problem Solving Project –Bungee Boom, Bridges or Towers
Essential Questions	1.What is CAD? 2.In what ways can CAD be better than board drawing? 3.How can using CAD improve your work? 4.Is using CAD a computer skill or a drafting tool?	1.What can we learn by solving this problem? 2.What role will drafting & safety play in the process...? 3. How can teamwork improve your odds for success?	1.What can we learn by solving this problem? 2.How can we incorporate the safety devices that exist in transportation today to solve this problem?	1.What can we learn by solving this problem? 2.What events in history can be used to help solve this structural problem? 3.What technologies have been developed in this area?	1.What can we learn by solving this problem? 2.What events in history can be used to help solve this structural problem?
Concepts/ Knowledge/ Content	Students will produce various basic drawings using Computer Aided Drawing.	Using limited materials, students will design and build #1 or #2: 1. A device that will travel along a suspended wire as far as possible in the least amount of time. 2. A device that will travel on both land and water	Students will design and build #1 or #2. (TBA) 1. A vehicle with three safety devices that will allow an egg passenger to survive a head on collision. 2. A device that will allow an egg astronaut to survive a free fall from space.	Students will design and build #1 or #2. (TBA) 1.An emergency shelter from hurricane debris materials. 2.A shelter that will withstand the forces of a shelter.	Using limited materials, students will design and build a tower and/or a bridge that will support as much weight as possible
Skills	Operating a computer File management Using CAD functions = drawing, text, editing, settings, layers, inquiry dimensioning, object snap. Plotting CAD drawings. Centering drawings Orthographic interpretation Dimensioning Basic Math w/ # conversion	Brainstorming Model storming Team work Drawing plans Using design processes Fabricating a model	Brainstorming Model storming Team work Drawing plans Using design processes Fabricating a model	Researching Brainstorming Model storming Drawing plans Using design processes Fabricating a model	Researching Brainstorming Model storming Drawing plans Using design processes Fabricating a model
Assessments	Performance assessment drawings, Peer checking, Rubric w/self & teacher evaluation, Quiz	Performance assessment drawings and model Rubric w/team & teacher evaluation. Reflection	Performance assessment drawings and model. Rubric w/self & teacher evaluation, Reflection	Performance assessment drawings and model. Rubric w/self & teacher evaluation, Reflection	Performance assessment drawings and model. Rubric w/self & teacher evaluation, Reflection
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*	Note: Depending on the course, length of units, and available supplies, some months of curriculum mapping may be altered to meet the needs of the students, teachers, and/or District Essential Curriculum.
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