



Computer Aided Drafting & Design Unit 2: Orthographic Projection

Unit Focus

This second unit focuses on the methods needed to create a working drawing that is functional and prepares a person or computer to build/construct or machine a part. Orthographic projection is widely used in engineering practice to make working drawings. Engineers are required to design, revise, analyze, and/or construct complex parts or systems. These parts or systems, are conceived or exist due to working drawings. A working drawing, is usually the last drawing produced by a designer. It normally has three accurate views of a product, a front view, side view and plan view, dimensions (measurements) and a bill of materials. The PBA will have students go through the whole process of designing a paddle boat from creating a full set of working drawings, building a model prototype then making corrections to the working drawings.

Stage 1: Desired Results - Key Understandings

Standard(s)	Transfer	
<p>Connecticut Goals and Standards <i>Computer Aided Drafting and Design: 12</i></p> <ul style="list-style-type: none"> Understand the orthographic projection process for developing multi-view drawings. <i>CADD.05.02</i> Create orthographic, isometric, section, and auxiliary views.(E25) <i>CADD.05.06</i> Explain and demonstrate the process for creating orthographic, isometric, section views, and auxiliary view.* <i>CADD.05.12</i> Generate a pictorial drawing.*(E28) <i>CADD.05.15</i> Explain the use and need for scaled drawings.*(E30) <i>CADD.05.17</i> Interpret basic views and dimensions in a working drawing.*(D17) <i>CADD.09.01</i> Interpret drawings, pictures, and symbols.*(D19) <i>CADD.09.03</i> <p>ITEEA - Standards for Technological Literacy <i>Technological Literacy: K-12</i></p> <ul style="list-style-type: none"> Students will develop an understanding of the characteristics and scope of technology. (1) Students will develop an understanding of the attributes of design. (8) Students will develop the abilities to use and maintain technological products and systems. (12) <p>Madison Public Schools Profile of a Graduate</p>	<p><i>Students will be able to independently use their learning to...</i></p> <p>T1 Communicate effectively based on purpose, task, and audience using appropriate vocabulary. T2 Explore and hone techniques, skills, methods, and processes to create and innovate.</p>	
	Meaning	
	Understanding(s)	Essential Question(s)
	<p><i>Students will understand that...</i></p> <p>U1 The design industry has standards for dimensioning effectively and appropriately. U2 Orthographic projection drawings are considered to be the official "language" of any design industry therefore all design professionals need to be fluent in this language. U3 Auxiliary and Exploded views are additional representations used in orthographic projection drawings and are essential for properly representing complex parts.</p>	<p><i>Students will keep considering...</i></p> <p>Q1 Why is the ability to read and understand the language of working drawings important for success in the design industry? Q2 How do auxiliary and exploded views increase the accuracy and readability of an object being visualized?</p>
Acquisition of Knowledge and Skill		
Knowledge	Skill(s)	
<p><i>Students will know...</i></p> <p>K1 An orthographic projection is a multi-view drawing used to show all of the features of an object. K2 Vocabulary: Auxiliary view, sectional view, exploded views, faces, planes, axis, features, dimensions K3 Six principle views of a given object.</p>	<p><i>Students will be skilled at...</i></p> <p>S1 Hand sketch a 3 dimensional object Orthographically including all of the features. S2 Using a 3D modeling software application, create a working drawing for a given part and/or assembly.</p>	

Stage 1: Desired Results - Key Understandings

- Collective Intelligence: Working respectfully and responsibly with others, exchanging and evaluating ideas to achieve a common objective. (POG.3.1)
- Product Creation: Effectively use a medium to communicate important information. (POG.3.2)

K4 Working drawings outline the dimensions, materials, etc required for fabrication.
K5 Standardized protocol in working drawings.
K6 The different line types are: Object, hidden, center, dimension, extension, cutting planes and section.
K7 ANSI vs. ISO dimensioning standards.

S3 Create an auxiliary and sectional view within a 3D modeling software application.
S4 Dimension all of the features of an object/s within a working drawing following ANSI standards.