Madison Public Schools

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

Established Goals

Connecticut Goals and Standards
Computer Aided Drafting and Design: 12

- Understand the orthographic projection process for developing multi-view drawings. *CADD.05.02*
- Create orthographic, isometric, section, and auxiliary views.(E25) *CADD.05.06*
- Explain and demonstrate the process for creating orthographic, isometric, section views, and auxiliary view.* *CADD.05.12*
- Generate a pictorial drawing.*(E28) *CADD.05.15*
- Explain the use and need for scaled drawings.*(E30) *CADD.05.17*
- Interpret basic views and dimensions in a working drawing.*(D17) *CADD.09.01*
- Interpret drawings, pictures, and symbols.*(D19) *CADD.09.03*

Student Growth and Development 21st Century Capacities Matrix
Collaboration/Communication

- Collective Intelligence: Students will be able to work respectfully and responsibly with others,

Transfer

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

Meaning

Understandings

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.

Essential Questions

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?

Acquisition of Knowledge and Skill

Knowledge

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

Skills

S1 Hand sketch a 3 dimensional object Orthographically including all of the features.
S2 Using a 3D modeling software application, create a

Stage 1: Desired Results - Key Understandings		
exchanging and evaluating ideas to achieve a common objective. *MM.3.1* • Product Creation: Students will be able to effectively use a medium to communicate important information (findings, ideas, feelings, issues, etc.) for a given purpose. *MM.3.2*	views, faces, planes, axis, features, dimensions **K3** Six principle views of a given object. **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.	working drawing for a given part and/or assembly. **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.