

Core Concept: Engineering Graphics

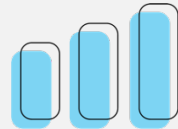
Engineering Literacy Dimension: Engineering Practices

Practice: Engineering Design

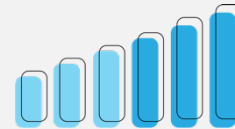
Overview: *Engineering Graphics* are detailed and well-annotated visual illustrations that communicate the features and functions of a design or idea. Oftentimes, these representations are initially created by hand but they almost always transferred to a digital format using three-dimensional computer aided design software following a specific set of rules and guidelines. Sophistication in this process requires knowledge related to (a) *the conventions for creating and reading engineering drawings*, (b) *dimensioning and tolerances*, (c) *two-dimensional sketching and computer aided design*, and (d) *three-dimensional parametric modeling*. This core concept is important to the practice of Engineering Design as engineering professionals embody, communicate, and record their ideas through graphical representations that accurately detail and convey the features and performance expectations of their designs.

Performance Goal for High School Learners

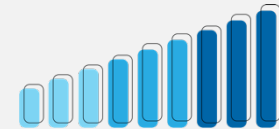
I can successfully interpret, analyze, and create graphical representations of a design idea following commonly accepted conventions.



Basic



Proficient



Advanced

CONVENTIONS FOR CREATING & READING ENGINEERING DRAWINGS

I can identify and explain the purpose of basic engineering drawings (e.g. orthographic, isometric, cross-sectional views).

I can construct multiple types of engineering drawings (e.g. orthographic, isometric, cross-sectional views).

I can construct multiple types of engineering drawings that adhere to current industry standards and conventional practices for different communication needs.

DIMENSIONING & TOLERANCES

I can identify and explain accepted standards and conventional practices for dimensioning and tolerances of engineering drawings.

I can add dimensions and tolerances to an engineering drawing.

I can add dimensions and tolerances to an engineering drawing that adhere to current industry standards and conventional practices.

TWO-DIMENSIONAL SKETCHING & COMPUTER AIDED DESIGN

I can identify and explain basic 2D CADD terms, concepts, and commands.

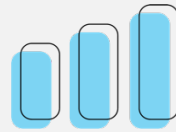
I can construct a 2D CADD engineering drawing.

I can construct a 2D CADD engineering drawing that adhere to current industry standards and conventional practices.

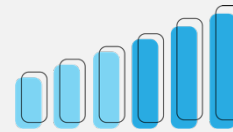
Core Concept: Engineering Graphics Cont.

Performance Goal for High School Learners

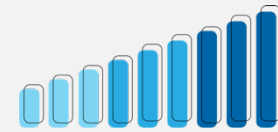
I can successfully interpret, analyze, and create graphical representations of a design idea following commonly accepted conventions.



Basic



Proficient



Advanced

THREE-DIMENSIONAL PARAMETRIC MODELING

I can identify and explain techniques for creating, modifying, and duplicating 3D geometry.

I can construct a 3D parametric model.

I can construct a 3D parametric model and generate an engineering drawing that adheres to current industry standards and conventional practices.