

# Engineering Drawing: Communication Unit

<p><b>ESTABLISHED GOALS:</b></p> <p><u>Competencies:</u></p> <ul style="list-style-type: none"> <li>Students will demonstrate the ability to use computer aided drafting and design (CAD) software in order to model a 3D object</li> <li>Students will demonstrate the ability to create technical drawings in order to communicate a design.</li> <li>Students will demonstrate the ability to analyze and summarize text and integrate knowledge to make meaning of discipline-specific materials.</li> <li>Students will demonstrate the ability to produce coherent and supported writing in order to communicate effectively for a range of discipline-specific tasks, purposes, and audiences.</li> <li>Students will demonstrate the ability to speak purposefully and effectively by strategically making decisions about content, language use, and discourse style.</li> </ul> <p><u>Content Standards:</u></p> <p>New Hampshire Vocational Curriculum Guide</p> <ul style="list-style-type: none"> <li>Standard 1: Students will develop an understanding of the characteristics and scope of technology.</li> <li>Standard 2: Students will develop an understanding of the core concepts of technology.</li> <li>Standard 3: Students will develop an understanding of the relationships among technologies and the connections between technology and other fields of study.</li> <li>Standard 8: Students will develop an understanding of the attributes of design.</li> <li>Standard 12: Students will develop the abilities to use and maintain technological products and systems.</li> <li>Standard 17: Students will develop an understanding of and be able to select and use information and communication technologies.</li> </ul>	<b>Transfer</b>	
	<i>Students will be able to independently use their learning to communicate a design.</i>	
	<b>Meaning</b>	
	<p><b>ENDURING UNDERSTANDINGS</b> <i>Students will understand that...</i></p> <ul style="list-style-type: none"> <li>two- and three-dimensional (2D and 3D) objects share visual relationships which allow interpretation of one perspective from the other.</li> <li>technical drawings convey information according to an established set of drawing practices which allow for detailed and universal interpretation of the drawing.</li> <li>computer aided drafting and design (CAD) software packages facilitate the creation of technical drawings.</li> </ul>	<p><b>ESSENTIAL QUESTIONS</b></p> <ul style="list-style-type: none"> <li>What quality makes a set of drawings sufficient to adequately represent the design intent?</li> <li>How can an engineer or technical professional effectively communicate ideas and solutions in a global community?</li> </ul>
<b>Acquisition</b>		
<p><i>Students will know...</i></p> <ul style="list-style-type: none"> <li>that technical drawings effectively communicate a design using two- and three-dimensional (2D and 3D) graphical representations and annotations.</li> <li>that various engineering standards exist that govern the use of line types, dimensions and other annotations on technical drawings.</li> <li>the characteristics, scope and core concepts of the technologies that are used.</li> </ul> <p><u>vocabulary:</u> annotate, annotations, aligned dimension, American National Standards Institute (ANSI), assembly drawing, chain dimensioning, datum, datum dimensioning, depth, dimension, height, isometric sketch, line, line conventions, multiview drawing, orthographic projection, part drawing, scale, technical working drawing, three-dimensional, title block, two-</p>	<p><i>Students will be skilled at...</i></p> <ul style="list-style-type: none"> <li>hand sketching isometric sketches and orthographic projections             <ul style="list-style-type: none"> <li>at a given scale and in the correct orientation to fully detail</li> <li>with detailed verbal description of the object,</li> <li>with pictorial and isometric views of the object.</li> </ul> </li> <li>using a CAD software program to generate multi-view technical drawings according to accepted engineering practice and a set of standards.             <ul style="list-style-type: none"> <li>using appropriate scale,</li> <li>correct view orientation,</li> <li>appropriate view selection</li> </ul> </li> <li>annotating technical drawings according to</li> </ul>	

	dimensional, unidirectional dimension, width	<p>accepted engineering practice and a set of standards.</p> <ul style="list-style-type: none"> <li>○ using dimensions and notes,</li> <li>● creating a set of technical drawings to detail a design project in a clear and concise manner.</li> <li>● evaluating the relationships among technologies and other field of study.</li> </ul>
<b>Content Area Literacy Standards</b>		<b>21<sup>st</sup> Century Skills</b>
<p>RST.11-12.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>RST.11-12.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to <i>grades 11-12 texts and topics</i>.</p> <p>RST.11-12.7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>WHST.11-12.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.</p> <p>WHST.11-12.4 Produce clear and coherent writing in which the development, organizations, and style are appropriate to task, purpose, and audience.</p>		<ul style="list-style-type: none"> <li>● <i>Apply technology effectively</i></li> <li>● <i>Communicate clearly</i></li> <li>● <i>Think creatively</i></li> <li>● <i>Be self-directed learners</i></li> </ul>
<b>Science and Engineering Practices</b>		<ul style="list-style-type: none"> <li>●</li> </ul>
<p>S&amp;E P 1. Asking questions (for science) and defining problems (for engineering)</p> <p>S&amp;E P 2. Developing and using models</p> <p>S&amp;E P 4. Analyzing and interpreting data</p> <p>S&amp;E P 5. Using mathematics and computational thinking</p> <p>S&amp;E P 6. Constructing explanations (for science) and designing solutions (for engineering)</p> <p>S&amp;E P 8. Obtaining, evaluating, and communicating information</p>		<ul style="list-style-type: none"> <li>●</li> </ul>

<i>Evaluative Criteria</i>	<i>Assessment Evidence</i>
	PERFORMANCE TASK(S):
	OTHER EVIDENCE:

<i>Summary of Key Learning Events and Instruction</i>	
<i>Language Arts Integration</i>	<i>Mathematics Integration</i>
<ul style="list-style-type: none"> <li>• 1.OA.1 Use</li> </ul>	<ul style="list-style-type: none"> <li>• 1.OA.1 Use</li> </ul>
<i>Technology Integration</i>	<i>District Materials</i>
<ul style="list-style-type: none"> <li>• 1.OA.1 Use</li> </ul>	