ESCONDIDO UNION HIGH SCHOOL DISTRICT

Advanced Graphic Production Technologies

Approved by the Board of Education on August 2, 2022
EUHSD curriculum identifies what students should know and be able to do by grade level in a comprehensive, standards-based course of study. Curriculum may be updated, as needed, based on student academic achievement data, research and best practices, and input from stakeholders. The EUHSD curriculum contains the following information:

- **Course Description** – provides a description of the overarching content and goals of the course and is used in the Course Catalog.
- **Course Information** – provides information specific to length of course, course number, transcript abbreviation, credits earned.
- **Course Requirements** – provides information specific to credits, prerequisites, UC/CSU requirements, and grade level of the course.
- **Course Material(s)** – Instructional materials used in course.
- **Scope and Sequence** – provides the standards-based units of instruction including the Learning Objective and Sample Performance Tasks and Assessments.

To ensure all courses empower every student, specifically emerging multilingual students, to graduate prepared for college, career, and life, all EUHSD courses will:

- Incorporate the English Language Development state standards adopted by the CA Department of Education in 2012. Visit the following website to learn more about the new descriptors and corresponding standards: https://www.cde.ca.gov/sp/el/er/documents/eldstdspub14.pdf
- Highlight specific strategies designed to meet the needs of emerging multilingual students as outlined in the 2014 CA Department of Education ELA-ELD Framework and the 2017 CA EL Roadmap. Visit the following URL to learn more about the new Frameworks: https://www.cde.ca.gov/ci/rl/cf/documents/elaeldfwchapter11.pdf. To learn more about the CA EL Roadmap, visit the following website: https://www.cde.ca.gov/sp/el/rm/
This course will build on the methods and procedures used in the Graphic Production Technologies class and is designed to prepare students for a career in design or computer-aided drafting. This course will teach students the steps to understand concepts and terminology used for designing different products through 3D models and prints/drawings. Students will apply knowledge from this class in a variety of ways, including the creation of usable products and landscapes. *Students who repeat this course participate in new standards-aligned tasks designed to build upon the knowledge and skills from the previous year.

### Course Information

| Semester A: | Course Number: | 6488 | Transcript Abbreviation: | ADV GRPH TECH A (P) | Credits: | 5 | Weighted: | No |
| Semester B: | Course Number: | 6489 | Transcript Abbreviation: | ADV GRPH TECH B (P) | Credits: | 5 | Weighted: | No |

### Course Requirements

| Length of Course: | Yearlong | Course Learning Environment: | Classroom Based | Type of Grade: | Letter Grade |
| Grade Level: | 10-12 | Course Repeatable: | Yes | Maximum Credits, if Repeatable: | 30 |
| Course Type: | College Prep | Designated College Prep/CTE: | Yes | CTE Course Level: | Capstone |

Meets EUHSD Graduation Requirement: Fine Arts or Designated College Prep/CTE or Elective Credit  
Meets UC/CSU Requirement: F: Visual and Performing Arts  
Required Prerequisite(s): Graphic Production Technologies  
Recommended Prerequisite(s): None

### Course Material(s)

- This course uses Open Educational Resources (OERs) in order to access current digital libraries that are pivoting rapidly to industry needs.

### Standards

Common Core State Standards English Language Arts & Literacy, California Department of Education Career Technical Education Manufacturing and Product Development - Knowledge and Performance Anchor Standards, CTE Graphic Production Technologies Pathway Standards, and California Arts Standards for Media Arts and Visual Arts (VAPA Standards)
Scope and Sequence

Unit 1: Introduction to CAD/Safety Expectations

Unit Description
Computer Aided Drawing (CAD) is now used extensively throughout the engineering industry as a means of communicating drawing data to required standards. The content of this unit focuses on the history, evolution, and present-day evolution of the industry. Safety in the workplace and the equipment are emphasized. CAD design is used by architects, construction managers, and engineers, and has replaced manual drafting. It helps users create designs in either 2D or 3D to visualize construction, and enables the development, modification, and optimization of the design process.

Unit Outline

<table>
<thead>
<tr>
<th>Standards</th>
<th>Learning Objectives</th>
<th>Essential Questions</th>
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<tbody>
<tr>
<td>Common Core State Standards English Language Arts &amp; Literacy:</td>
<td>Students will…</td>
<td>1. How is CAD used as a tool for design?</td>
</tr>
<tr>
<td>● Reading Standard: 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. (CCSS.ELA-LITERACY.RLST.11-12.3)</td>
<td>● demonstrate understanding of the uses of CAD in design.</td>
<td>2. What advantages does 3D computer-aided design CAD provide over paper and pencil design?</td>
</tr>
<tr>
<td>● Reading Standard: 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 grades 11-12 texts and topics. (CCSS.ELA-LITERACY.RLST.11-12.4)</td>
<td>● create a variety of drawings using CAD software.</td>
<td>3. What advantages does paper and pencil design provide over CAD?</td>
</tr>
<tr>
<td>● Writing Standard: Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. (CCSS.ELA-LITERACY.W.11-12.2.D)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. (CCSS.ELA-LITERACY.W.11-12.6)</td>
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</tr>
</tbody>
</table>

Manufacturing and Product Development - Knowledge and Performance Anchor Standards:

● 4.0 Technology: Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Manufacturing and Product Design sector workplace environment.
● 6.0 Health and Safety: Demonstrate health and safety procedures, regulations, and personal health practices and

Sample Performance Tasks/Assessments

● Pass safety test as required to use CAD programs.
● Describe the advantages, compared to other methods, of producing drawings electronically using a CAD package.
● Produce a project that demonstrates the student’s understanding of the benefits of using CAD over conventional drawing techniques. This assignment helps the student build foundational knowledge of CAD.
determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Manufacturing and Product Design sector workplace environment.

- **10.0 Technical Knowledge and Skills:** Apply essential technical knowledge and skills common to all pathways in the Manufacturing and Product Design sector, following procedures when carrying out experiments or performing technical tasks.
- **11.0 Demonstrate and apply the knowledge and skills contained in the Manufacturing and Product Design anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations.

**Graphic Production Technologies Pathway Standards:**
- **A1.0** Apply the basic graphic design principles to achieve effective visual communication.
- **A1.1** Identify the relationships between space, color, image, and content.
- **A1.2** Demonstrate the graphic design principles and the utilization of the grid system in applying those principles.
- **A1.3** Create a basic layout applying images, text, and typography.
- **A2.0** Demonstrate an understanding of the psychology of color and color theory as it relates to visual communication.
- **A2.1** Understand the science of color spectrum and other aspects of color as it relates to hue, value, and chroma.
- **A3.4** Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.
- **A4.0** Demonstrate technical illustration and vector drawing skills.
- **A4.1** Create technical illustration and vector drawings.
- **A5.1** Gain proficiency in applying the principles and processes used to prepare design work for the prepress phase of graphic design.
- A10.2 Identify the visual characteristics and differences between analog and digital outputs.
- A11.1 Explore and apply animated effects to the elements of design, which include text, color, and imagery.
- A11.2 Produce a visually dynamic communication project that applies animated effects to various elements of the design.

**California Arts Standards for Media Arts:**

- **Acc.MA:Re7:** a. Analyze and explain the qualities of and relationships between the components, form and content, aesthetics, intentions and contexts of a variety of media artworks.
- **Acc.MA:Re7:** b. Analyze and explain how diverse media artworks manage audience experience and create intention and persuasion through multimodal perception.
- **Prof.MA:Re8:** Analyze the intent, meanings, and reception of a variety of media artworks, focusing on personal and cultural contexts.
- **Acc.MA:Cn10:** b. Explain and demonstrate the use of media artworks to synthesize new meaning and knowledge, in addition to reflecting and forming cultural experiences, such as new connections between themes and ideas, and personal influence.
- **Acc.MA:Cn11:** a. Examine in depth and demonstrate the relationships of media arts ideas and works to various contexts, purposes, and values, such as markets, systems, propaganda, and truth.
- **Acc.MA:Cn11:** b. Critically investigate and proactively interact with legal, technological, systemic, and vocational contexts of media arts, considering civic values, media literacy, digital identity, and artist/audience interactivity.
## Unit 2: Fundamentals of CAD Manufacturing

### Unit Description

Upon completion of this unit, students will understand the basics of how to measure and lay out a project that they have designed. Students will become proficient with a tape measure, square, compass, ruler, and other tools involved in the design/layout process. Students are introduced to the elements of a technical drawing through demonstration and lecture. Various CAD drawing activities are assigned when students reach key points in the discussion to develop their drawing skills.

### Unit Outline

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<tr>
<th>Standards</th>
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<tr>
<td><strong>Common Core State Standards English Language Arts &amp; Literacy:</strong></td>
<td>Students will...</td>
<td>1. What CAD commands and technical information should be included on a drawing used to build/design a mechanical object?</td>
</tr>
<tr>
<td>- <strong>Reading Standard:</strong> Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. (CCSS.ELA-LITERACY.RST.9-10.1)</td>
<td>• identify the basic tools used by the drafter and the objectives of drafting.</td>
<td>2. What are steps in the CAD design process?</td>
</tr>
<tr>
<td>- <strong>Reading Standard:</strong> 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. (CCSS.ELA-LITERACY.RLST.11-12.3)</td>
<td>• understand the difference of various tools used in CAD design.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Reading Standard:</strong> 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 grades 11-12 texts and topics. (CCSS.ELA-LITERACY.RLST.11-12.4)</td>
<td>• utilize CAD commands to draw lines, arcs, polygons, and circles of specified size.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Writing Standard:</strong> Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. (CCSS.ELA-LITERACY.W.11-12.2.D)</td>
<td>• know how to read and measure using the architect, engineer, and metric scale.</td>
<td></td>
</tr>
<tr>
<td>- <strong>Writing Standard:</strong> Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. (CCSS.ELA-LITERACY.W.11-12.6)</td>
<td>• utilize the text command to add lettering to a drawing.</td>
<td></td>
</tr>
<tr>
<td><strong>Manufacturing and Product Development - Knowledge and Performance Anchor Standards:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 4.0 Technology: Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Manufacturing and Product Design sector workplace environment.</td>
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</table>

### Sample Performance Tasks/Assessments

- Read any type of drawing and understand the object depicted in the sketch.
- Create drawings of both two-and three-dimensional objects using the correct drawing commands. Draw several objects to scale using a variety of CAD commands.
- Use CAD to design an open outdoor space, like a park or a backyard.
- Draw the primary views of an orthographic drawing in proper orientation and alignment.
6.0 Health and Safety: Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Manufacturing and Product Design sector workplace environment.

10.0 Technical Knowledge and Skills: Apply essential technical knowledge and skills common to all pathways in the Manufacturing and Product Design sector, following procedures when carrying out experiments or performing technical tasks.

11.0 Demonstrate and apply the knowledge and skills contained in the Manufacturing and Product Design anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations.

**Graphic Production Technologies Pathway Standards:**

- A3.4 Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.
- A3.5 Produce a printed product that demonstrates the application of graphic design principles and color theory using desktop publishing and electronic imaging software.
- A4.0 Demonstrate technical illustration and vector drawing skills.
- A4.1 Create technical illustration and vector drawings.
- A4.2 Convert and edit formats including encapsulated postscript (eps), drawing (dwg), and portable document file (pdf).
- A5.0 Adhere to the prepress process and procedures required to reproduce single-color and multicolor printing.
- A5.1 Gain proficiency in applying the principles and processes used to prepare design work for the prepress phase of graphic design.
- A5.3 Produce a printed product with the use of desktop publishing and electronic imaging software starting with the prepress phase through to reproduction.
- A11.2 Produce a visually dynamic communication project that applies animated effects to various elements of the design.
- A12.0 Demonstrate a proficiency in digital video production and the post-production process.
- A14.0 Identify the different industries that utilize graphic design and identify other potential business opportunities for graphic design applications.
- A14.1 Apply research methodologies and business and entrepreneurial principles to identify potential business opportunities to apply graphic and multimedia design.

**California Arts Standards for Visual Arts:**

- Acc.VA:Cr1.1: Individually or collaboratively formulate new creative problems based on students’ existing artwork.
- Prof.VA:Cr1.1: Use multiple approaches to begin creative endeavors.
- Acc.VA:Cr2.1: Through experimentation, practice, and persistence, demonstrate acquisition of skills and knowledge in a chosen art form.
- Prof.VA:Cr3: Apply relevant criteria from traditional and contemporary cultural contexts to examine, reflect on, and plan revisions for works of art and design in progress.
Unit Description

Students will diagram and develop mathematical components for product development. An isometric projection or view allows an engineer to observe all three dimensions (height, width, and depth) in a single view. It is another facet of the industry accepted format for communicating design ideas and technical information for all fields of engineering and design. It is introduced after students have a basic working knowledge of the CAD commands and visualization techniques required to do so. Students will create an isometric view from a multiview drawing.

Students employ the Cartesian system whereby the plane of x and y works well with many simple situations. Students will draw a two-dimensional grid representing the room and use an appropriate unit of measurement for furniture and other projects using this system. Multiview projection (orthographic projection) is the industry accepted format for communicating design ideas and technical information for all fields of engineering and design.

Unit Outline

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<tr>
<td><strong>Common Core State Standards English Language Arts &amp; Literacy:</strong></td>
<td></td>
<td>1. How can various 2-dimensional objects be presented in 3-dimensions? 2. How are geometric shapes used in design? 3. How are mathematical influences found in art and design?</td>
</tr>
<tr>
<td>● Reading Standard: Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. (CCSS.ELA-LITERACY.RST.9-10.1)</td>
<td>Students will…</td>
<td></td>
</tr>
<tr>
<td>● Reading Standard: 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 grades 11-12 texts and topics. (CCSS.ELA-LITERACY.RLST.11-12.4)</td>
<td>● demonstrate the differences between multiview projection, axonometric projection, oblique projection, and perspective.</td>
<td></td>
</tr>
<tr>
<td>● Writing Standard: Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. (CCSS.ELA-LITERACY.W.11-12.2.D)</td>
<td>● demonstrate the difference between an isometric cube, a diametric cube, and a trimetric cube.</td>
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</tr>
<tr>
<td>● Writing Standard: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (CCSS.ELA-LITERACY.W.11-12.4)</td>
<td>● describe the advantages of multiview projection, axonometric projection, oblique projection, and perspective.</td>
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</tr>
<tr>
<td>● Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. (CCSS.ELA-LITERACY.W.11-12.6)</td>
<td>● demonstrate how to measure along each isometric axis.</td>
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<td>● demonstrate the six standard views of an object.</td>
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<td>● demonstrate the height, width, or depth dimensions between views.</td>
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<td>● demonstrate how to lay out a three-view drawing so it is centered on the drawing medium.</td>
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</tbody>
</table>
### Manufacturing and Product Development - Knowledge and Performance Anchor Standards:

- **4.0 Technology:** Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Manufacturing and Product Design sector workplace environment.
- **5.0 Problem Solving and Critical Thinking:** Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Manufacturing and Product Design sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.
- **6.0 Health and Safety:** Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Manufacturing and Product Design sector workplace environment.
- **10.0 Technical Knowledge and Skills:** Apply essential technical knowledge and skills common to all pathways in the Manufacturing and Product Design sector, following procedures when carrying out experiments or performing technical tasks.
- **11.0** Demonstrate and apply the knowledge and skills contained in the Manufacturing and Product Design anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations.

### Graphic Production Technologies Pathway Standards:

- **A1.0** Apply the basic graphic design principles to achieve effective visual communication.
- **A1.1** Identify the relationships between space, color, image, and content.
- **A1.2** Demonstrate the graphic design principles and the utilization of the grid system in applying those principles.

### Sample Performance Tasks/Assessments

- know the conventional practices to the revolution of ribs, spokes, and webs.
- identify and draw visible and hidden lines in all six standard views.
- identify and project surfaces appearing in all views.

- Draw an example of an isometric cube, a diametric cube, and a trimetric cube.
- Create an isometric drawing given a multiview drawing.
- Draw inclined and oblique surfaces in isometric.
- Draw angles, ellipses, and irregular curves in isometric.
- Students will design a graphic for a skateboard or a promotional flier that uses isometric design. Students will demonstrate understanding of mathematical concepts used for design by labeling the different mathematical components on the graphic.
- A1.3 Create a basic layout applying images, text, and typography.
- A2.0 Demonstrate an understanding of the psychology of color and color theory as it relates to visual communication.
- A2.1 Understand the science of color spectrum and other aspects of color as it relates to hue, value, and chroma.
- A2.2 Explain the differences between methods used to describe color, including cyan, magenta, yellow, black (CMYK) and red, green, blue (RGB).
- A2.3 Produce a printed product in monotone and in multicolor.
- A3.0 Apply graphic design software and desktop publishing as a means of creating effective communication.
- A3.1 Differentiate between and operate Macintosh (Mac) and personal computer (PC) platforms for development.
- A3.2 Apply desktop publishing and electronic imaging software principles and processes used to prepare graphic design products.
- A3.3 Demonstrate how to produce single and multicolor images and know how to apply them across various types of printed products.
- A3.4 Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.
- A7.3 Produce a single-color and multicolor quality project applying the procedures and image transfer processes with a minimum of waste.
- A10.3 Apply the principles of composition and lighting used in photography.
- A10.4 Produce black-and-white and color images under natural and studio lighting conditions in both analog and digital output.
- A11.0 Apply various animation and motion graphic software to create dynamic visual communication outcomes.
- A11.1 Explore and apply animated effects to the elements of design, which include text, color, and imagery.
- A14.0 Identify the different industries that utilize graphic design and identify other potential business opportunities for graphic design applications.
- A14.1 Apply research methodologies and business and entrepreneurial principles to identify potential business opportunities to apply graphic and multimedia design.

**California Arts Standards for Visual Arts:**
- Acc.VA:Cr1.1: Individually or collaboratively formulate new creative problems based on students’ existing artwork.
- Prof.VA:Cr1.1: Use multiple approaches to begin creative endeavors.
- Acc.VA:Cr2.1: Through experimentation, practice, and persistence, demonstrate acquisition of skills and knowledge in a chosen art form.
- Prof.VA:Cr3: Apply relevant criteria from traditional and contemporary cultural contexts to examine, reflect on, and plan revisions for works of art and design in progress.
## Unit 4: Orthographic Projection

### Unit Description
Throughout this unit, students will learn how to represent 3D objects with 2D imaging. They will become familiar with the six views: front, top, left side, right side, bottom, and rear. Software will help them become familiar with this projection process. Students will have several opportunities to practice by progressing from drawing to product development while implementing orthographic projection both individually and as members of teams. Accurate dimensions are critical for drawings to have any meaning. There are many standards that govern the placement of dimensions in a drawing. Students are assigned the task of adding and correctly placing dimensions on all their drawings. Tolerances are a subset of the topic of dimensions and determine the degree of accuracy to which the dimensions of manufactured or constructed objects must be held to be acceptable.

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<tr>
<td><strong>Common Core State Standards English Language Arts &amp; Literacy:</strong></td>
<td>Students will...</td>
<td>1. What are the 3 main views of an orthographic drawing?</td>
</tr>
<tr>
<td>- Reading Standard: 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. (CCSS.ELA-LITERACY.RLST.11-12.3)</td>
<td>- demonstrate how to use conventional dimensioning techniques to describe size and shape accurately on an engineering drawing.</td>
<td>2. How is orthographic projection used in design?</td>
</tr>
<tr>
<td>- Writing Standard: Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. (CCSS.ELA-LITERACY.W.11-12.2.D)</td>
<td>- demonstrate how to read a drawing at a specified scale.</td>
<td>3. How can an engineer accurately describe the dimensions and tolerances of a part or system of parts that are to be built or manufactured?</td>
</tr>
<tr>
<td>- Writing Standard: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (CCSS.ELA-LITERACY.W.11-12.4)</td>
<td>- demonstrate how to correctly place dimension lines, extension lines and notes.</td>
<td></td>
</tr>
<tr>
<td>- Writing Standard: Gather relevant information from multiple authoritative print and digital sources using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation including footnotes and endnotes. (CCSS.ELA-LITERACY.W.11-12.8)</td>
<td>- recognize aligned and unidirectional dimensioning systems.</td>
<td></td>
</tr>
<tr>
<td><strong>Anchor Standards:</strong></td>
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<tr>
<td>- 4.0 Technology: Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Manufacturing and Product Design sector workplace environment.</td>
<td>- understand how to dimension arcs, circles and inclined surfaces.</td>
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<td>- describe the nominal size, tolerance, limits, and allowance of two mating parts.</td>
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<td>- identify a clearance fit, interference fit, and transition fit.</td>
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<td>- specify position and geometric tolerances.</td>
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</tbody>
</table>

### Sample Performance Tasks/Assessments
- Use conventional dimensioning techniques to describe size and shape accurately on multiple engineering drawings.
| 6.0 Health and Safety: Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Manufacturing and Product Design sector workplace environment. |
| 10.0 Technical Knowledge and Skills: Apply essential technical knowledge and skills common to all pathways in the Manufacturing and Product Design sector, following procedures when carrying out experiments or performing technical tasks. |
| 11.0 Demonstrate and apply the knowledge and skills contained in the Manufacturing and Product Design anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations. |

**Graphic Production Technologies Pathway Standards:**

- A1.0 Apply the basic graphic design principles to achieve effective visual communication.
- A1.1 Identify the relationships between space, color, image, and content.
- A1.2 Demonstrate the graphic design principles and the utilization of the grid system in applying those principles.
- A2.0 Demonstrate an understanding of the psychology of color and color theory as it relates to visual communication.
- A2.1 Understand the science of color spectrum and other aspects of color as it relates to hue, value, and chroma.
- A3.0 Apply graphic design software and desktop publishing as a means of creating effective communication.
- A3.2 Apply desktop publishing and electronic imaging software principles and processes used to prepare graphic design products.
- A3.3 Demonstrate how to produce single and multicolor images and know how to apply them across various types of printed products.
- A3.4 Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.
- A4.0 Demonstrate technical illustration and vector drawing skills.

- Using CAD software, students will design and draw skateboard components or a shoe as a 3D rendering of the product.
- A4.1 Create technical illustration and vector drawings.
- A5.1 Gain proficiency in applying the principles and processes used to prepare design work for the prepress phase of graphic design.
- A5.2 Explain the differences in prepress for different output printing methods.
- A11.1 Explore and apply animated effects to the elements of design, which include text, color, and imagery.
- A11.2 Produce a visually dynamic communication project that applies animated effects to various elements of the design.
- A13.1 Apply design strategies in selecting graphic multimedia technologies to produce dynamic effective visual communication.
- A13.2 Practice the steps in producing an integrated graphic multimedia project designed to inform, teach, or sell.
- A13.3 Produce an integrated graphic multimedia project.
- A14.0 Identify the different industries that utilize graphic design and identify other potential business opportunities for graphic design applications.
- A14.1 Apply research methodologies and business and entrepreneurial principles to identify potential business opportunities to apply graphic and multimedia design.

**California Arts Standards for Visual Arts:**

- Acc.VA:Cr1.1: Individually or collaboratively formulate new creative problems based on students’ existing artwork.
- Prof.VA:Cr1.1: Use multiple approaches to begin creative endeavors.
- Acc.VA:Cr2.1: Through experimentation, practice, and persistence, demonstrate acquisition of skills and knowledge in a chosen art form.
- Prof.VA:Cr3: Apply relevant criteria from traditional and contemporary cultural contexts to examine, reflect on, and plan revisions for works of art and design in progress.
Unit 5: CAD Outdoor Design

Unit Description

Students will apply different kinds of entities/lines used on a blueprint and learn their purpose and lawful aspect of drawings specifications. Students will use software to design a skatepark that includes one “comfort amenity” and three different “skate-able amenities” including a signature element. Students will work individually or as teams for this project.

Students develop a sound understanding by creating and modifying basic 3D sketching components of a skateboard. This design will become a topic that is dissected thoroughly from concept to final outcome, giving students the opportunity to reflect and hone their newfound skills with greater precision. Industry experts will provide added guidance with the instructor to tie the projects to current business standards.

## Standards

**Common Core State Standards English Language Arts & Literacy:**

- **Reading Standard:** Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. (CCSS.ELA-LITERACY.RST.9-10.1)
- **Reading Standard:** 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. (CCSS.ELA-LITERACY.RLST.11-12.3)
- **Reading Standard:** 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 grades 11-12 texts and topics. (CCSS.ELA-LITERACY.RLST.11-12.4)
- **Writing Standard:** Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. (CCSS.ELA-LITERACY.W.11-12.2.D)
- **Writing Standard:** Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (CCSS.ELA-LITERACY.W.11-12.4)
- **Writing Standard:** Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. (CCSS.ELA-LITERACY.W.11-12.6)

## Learning Objectives

Students will…

- understand the theoretical, practical, and contextual issues that influence design, the relationship between architecture and the external environment, and the use of CAD in developing architectural designs.
- understand how to systematically complete an architectural project.
- explore the various ways in which civil engineers utilize technical drawings to describe the world around them.
- explore the relationship between civil engineering and the external environment.
- understand the use of CAD in developing civil designs.

## Essential Questions

1. What are the drawing techniques, symbols, and pertinent codes an architect uses to design a skatepark?
2. How can CAD software be used for projects such as landscaping?
3. What makes for an aesthetically pleasing space?

## Sample Performance Tasks/Assessments

- Design a sample skatepark layout.
- Sketch a bubble plan and single line plan.
- Draw a complete floor plan with all appropriate notes and dimensions.
### Manufacturing and Product Development - Knowledge and Performance

**Anchor Standards:**

- **4.0 Technology:** Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Manufacturing and Product Design sector workplace environment.
- **5.0 Problem Solving and Critical Thinking:** Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Manufacturing and Product Design sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.
- **10.0 Technical Knowledge and Skills:** Apply essential technical knowledge and skills common to all pathways in the Manufacturing and Product Design sector, following procedures when carrying out experiments or performing technical tasks.
- **11.0 Demonstrate and apply the knowledge and skills contained in the Manufacturing and Product Design anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations.**

### Graphic Production Technologies Pathway Standards:

- **A1.0 Apply the basic graphic design principles to achieve effective visual communication.**
- **A1.1 Identify the relationships between space, color, image, and content.**
- **A1.2 Demonstrate the graphic design principles and the utilization of the grid system in applying those principles.**
- **A1.3 Create a basic layout applying images, text, and typography.**
- **A3.2 Apply desktop publishing and electronic imaging software principles and processes used to prepare graphic design products.**
- **A3.3 Demonstrate how to produce single and multicolor images and know how to apply them across various types of printed products.**
- **Draw a complete foundation plan with all appropriate notes and dimensions. Draw front and side elevations with all appropriate notes and dimensions.**
- **Create a design of a skatepark and be able to present that park idea to the class for feedback.**
- A3.4 Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.
- A3.5 Produce a printed product that demonstrates the application of graphic design principles and color theory using desktop publishing and electronic imaging software.
- A4.0 Demonstrate technical illustration and vector drawing skills.
- A4.1 Create technical illustration and vector drawings.
- A11.1 Explore and apply animated effects to the elements of design, which include text, color, and imagery.
- A11.2 Produce a visually dynamic communication project that applies animated effects to various elements of the design.
- A13.1 Apply design strategies in selecting graphic multimedia technologies to produce dynamic effective visual communication.
- A13.2 Practice the steps in producing an integrated graphic multimedia project designed to inform, teach, or sell.
- A13.3 Produce an integrated graphic multimedia project.
- A14.0 Identify the different industries that utilize graphic design and identify other potential business opportunities for graphic design applications.
- A14.1 Apply research methodologies and business and entrepreneurial principles to identify potential business opportunities to apply graphic and multimedia design.

**California Arts Standards for Visual Arts:**
- Acc.VA:Cr1.1: Individually or collaboratively formulate new creative problems based on students’ existing artwork.
- Prof.VA:Cr1.1: Use multiple approaches to begin creative endeavors.
- Acc.VA:Cr2.1: Through experimentation, practice, and persistence, demonstrate acquisition of skills and knowledge in a chosen art form.
- Prof.VA:Cr3: Apply relevant criteria from traditional and contemporary cultural contexts to examine, reflect on, and plan revisions for works of art and design in progress.
Unit Description

Students will generate 3D MakerBot machine products that started from digital files via website or electronic storage. Team projects will introduce cost analysis and deadlines in replicating real-world contract deals in the manufacturing sector while involving MakerBot machines or similar manufacturing devices.

Unit Outline

<table>
<thead>
<tr>
<th>Common Core State Standards English Language Arts &amp; Literacy</th>
<th>Learning Objectives</th>
<th>Essential Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reading Standard</strong>: Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. (CCSS.ELA-LITERACY.RST.9-10.1)</td>
<td>Students will…</td>
<td>1. How can design be used to demonstrate personal and corporate values?</td>
</tr>
<tr>
<td><strong>Reading Standard</strong>: 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. (CCSS.ELA-LITERACY.RLST.11-12.3)</td>
<td></td>
<td>2. What aspects of business should designers be aware of when developing a product?</td>
</tr>
<tr>
<td><strong>Reading Standard</strong>: 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 grades 11-12 texts and topics. (CCSS.ELA-LITERACY.RLST.11-12.4)</td>
<td></td>
<td>3. What efforts go into the design and marketing of a product?</td>
</tr>
<tr>
<td><strong>Writing Standard</strong>: Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. (CCSS.ELA-LITERACY.W.11-12.2.D)</td>
<td></td>
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<td></td>
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</tr>
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<td><strong>Writing Standard</strong>: Gather relevant information from multiple authoritative print and digital sources using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of</td>
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</tbody>
</table>

Sample Performance Tasks/Assessments

- Work in teams to design a skate company logo.
- Create a shared vision for the company.
- Develop a 3D model of a skateboard or sneaker.
- Develop a cost analysis for their product.
ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation including footnotes and endnotes. (CCSS.ELA-LITERACY.W.11-12.8)

**Manufacturing and Product Development - Knowledge and Performance Anchor Standards:**

- **4.0 Technology:** Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Manufacturing and Product Design sector workplace environment.
- **5.0 Problem Solving and Critical Thinking:** Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Manufacturing and Product Design sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.
- **7.0 Responsibility and Flexibility:** Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Manufacturing and Product Design sector workplace environment and community settings.
- **10.0 Technical Knowledge and Skills:** Apply essential technical knowledge and skills common to all pathways in the Manufacturing and Product Design sector, following procedures when carrying out experiments or performing technical tasks.
- **11.0 Demonstrate and apply the knowledge and skills contained in the Manufacturing and Product Design anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations.**

**Graphic Production Technologies Pathway Standards:**

- **A1.0** Apply the basic graphic design principles to achieve effective visual communication.
- **A1.1** Identify the relationships between space, color, image, and content.
<table>
<thead>
<tr>
<th>A1.2</th>
<th>Demonstrate the graphic design principles and the utilization of the grid system in applying those principles.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1.3</td>
<td>Create a basic layout applying images, text, and typography.</td>
</tr>
<tr>
<td>A1.4</td>
<td>Create and choose font styles.</td>
</tr>
<tr>
<td>A2.0</td>
<td>Demonstrate an understanding of the psychology of color and color theory as it relates to visual communication.</td>
</tr>
<tr>
<td>A2.1</td>
<td>Understand the science of color spectrum and other aspects of color as it relates to hue, value, and chroma.</td>
</tr>
<tr>
<td>A2.2</td>
<td>Explain the differences between methods used to describe color, including cyan, magenta, yellow, black (CMYK) and red, green, blue (RGB).</td>
</tr>
<tr>
<td>A2.3</td>
<td>Produce a printed product in monotone and in multicolor.</td>
</tr>
<tr>
<td>A3.0</td>
<td>Apply graphic design software and desktop publishing as a means of creating effective communication.</td>
</tr>
<tr>
<td>A3.1</td>
<td>Differentiate between and operate Macintosh (Mac) and personal computer (PC) platforms for development.</td>
</tr>
<tr>
<td>A3.2</td>
<td>Apply desktop publishing and electronic imaging software principles and processes used to prepare graphic design products.</td>
</tr>
<tr>
<td>A3.3</td>
<td>Demonstrate how to produce single and multicolor images and know how to apply them across various types of printed products.</td>
</tr>
<tr>
<td>A3.4</td>
<td>Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.</td>
</tr>
<tr>
<td>A3.5</td>
<td>Produce a printed product that demonstrates the application of graphic design principles and color theory using desktop publishing and electronic imaging software.</td>
</tr>
<tr>
<td>A4.0</td>
<td>Demonstrate technical illustration and vector drawing skills.</td>
</tr>
<tr>
<td>A4.1</td>
<td>Create technical illustration and vector drawings.</td>
</tr>
<tr>
<td>A4.2</td>
<td>Convert and edit formats including encapsulated postscript (eps), drawing (dwg), and portable document file (pdf).</td>
</tr>
<tr>
<td>A5.0</td>
<td>Adhere to the prepress process and procedures required to reproduce single-color and multicolor printing.</td>
</tr>
</tbody>
</table>
- A7.1 Explain how various processes may be used to produce
- A10.0 Understand the analog and digital photographic applications.
- A10.1 Employ various photographic technology, processes, and materials used in graphic design.
- A10.2 Identify the visual characteristics and differences between analog and digital outputs.
- A10.3 Apply the principles of composition and lighting used in photography.
- A10.4 Produce black-and-white and color images under natural and studio lighting conditions in both analog and digital output.
- A11.0 Apply various animation and motion graphic software to create dynamic visual communication outcomes.
- A11.1 Explore and apply animated effects to the elements of design, which include text, color, and imagery.
- A11.2 Produce a visually dynamic communication project that applies animated effects to various elements of the design.
- A12.0 Demonstrate a proficiency in digital video production and the post-production process.
- A12.1 Identify the functions involved in the preproduction, production, and postproduction phases of video production.
- A12.2 Apply digital video technology processes and procedures used in producing a multimedia project.
- A12.3 Produce a digital media project from a storyboard utilizing current production and postproduction technologies.
- A13.0 Understand and apply integrated graphic multimedia technologies, combining graphics, photographic imagery, motion graphics and animation, video, and special effects.
- A13.1 Apply design strategies in selecting graphic multimedia technologies to produce dynamic effective visual communication.
- A13.2 Practice the steps in producing an integrated graphic multimedia project designed to inform, teach, or sell.
- A13.3 Produce an integrated graphic multimedia project.
- A14.0 Identify the different industries that utilize graphic design and identify other potential business opportunities for graphic design applications.
- A14.1 Apply research methodologies and business and entrepreneurial principles to identify potential business opportunities to apply graphic and multimedia design.

**California Arts Standards for Visual Arts:**
- Acc.VA:Cr1.1: Individually or collaboratively formulate new creative problems based on students’ existing artwork.
- Prof.VA:Cr1.1: Use multiple approaches to begin creative endeavors.
- Acc.VA:Cr2.1: Through experimentation, practice, and persistence, demonstrate acquisition of skills and knowledge in a chosen art form.
- Prof.VA:Cr3: Apply relevant criteria from traditional and contemporary cultural contexts to examine, reflect on, and plan revisions for works of art and design in progress.
## Unit Description

Using the measurements and design in the Computer Aided Drafting (CAD) program, students will create a cardboard skateboard that matches their online design. Steps for how to build a cardboard skateboard can be found at these sites:
- [https://www.instructables.com/Cardboard-Skateboard/](https://www.instructables.com/Cardboard-Skateboard/)

## Unit Outline

<table>
<thead>
<tr>
<th>Standards</th>
<th>Learning Objectives</th>
<th>Essential Questions</th>
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<td><strong>Common Core State Standards English Language Arts &amp; Literacy:</strong></td>
<td>Students will...</td>
<td>1. How can a design or product represent the person who created it?</td>
</tr>
<tr>
<td>• Reading Standard: 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. (CCSS.ELA-LITERACY.RLST.11-12.3)</td>
<td>• create a 3D product of the CAD design.</td>
<td></td>
</tr>
<tr>
<td>• Writing Standard: Use precise language, domain-specific vocabulary, and techniques such as metaphor, simile, and analogy to manage the complexity of the topic. (CCSS.ELA-LITERACY.W.11-12.2.D)</td>
<td>• create an artistic design for the skin of their skateboard that aligns to their business.</td>
<td></td>
</tr>
<tr>
<td>• Writing Standard: Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. (CCSS.ELA-LITERACY.W.11-12.6)</td>
<td>• demonstrate understanding of design and product creation using CAD.</td>
<td></td>
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<td>• Writing Standard: Gather relevant information from multiple authoritative print and digital sources using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation including footnotes and endnotes. (CCSS.ELA-LITERACY.W.11-12.8)</td>
<td>• explain and defend their product and creative process.</td>
<td></td>
</tr>
<tr>
<td><strong>Manufacturing and Product Development - Knowledge and Performance Anchor Standards:</strong></td>
<td></td>
<td></td>
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</table>
5.0 Problem Solving and Critical Thinking: Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem unique to the Manufacturing and Product Design sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

7.0 Responsibility and Flexibility: Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Manufacturing and Product Design sector workplace environment and community settings.

10.0 Technical Knowledge and Skills: Apply essential technical knowledge and skills common to all pathways in the Manufacturing and Product Design sector, following procedures when carrying out experiments or performing technical tasks.

11.0 Demonstrate and apply the knowledge and skills contained in the Manufacturing and Product Design anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations.

**Graphic Production Technologies Pathway Standards:**

- A1.0 Apply the basic graphic design principles to achieve effective visual communication.
- A1.1 Identify the relationships between space, color, image, and content.
- A1.2 Demonstrate the graphic design principles and the utilization of the grid system in applying those principles.
- A1.3 Create a basic layout applying images, text, and typography.
- A1.4 Create and choose font styles.
- A2.0 Demonstrate an understanding of the psychology of color and color theory as it relates to visual communication.
- A2.1 Understand the science of color spectrum and other aspects of color as it relates to hue, value, and chroma.
<table>
<thead>
<tr>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A2.2</td>
<td>Explain the differences between methods used to describe color, including cyan, magenta, yellow, black (CMYK) and red, green, blue (RGB).</td>
</tr>
<tr>
<td>A2.3</td>
<td>Produce a printed product in monotone and in multicolor.</td>
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<td>A3.0</td>
<td>Apply graphic design software and desktop publishing as a means of creating effective communication.</td>
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<td>A3.1</td>
<td>Differentiate between and operate Macintosh (Mac) and personal computer (PC) platforms for development.</td>
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<td>Apply desktop publishing and electronic imaging software principles and processes used to prepare graphic design products.</td>
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<td>A3.3</td>
<td>Demonstrate how to produce single and multicolor images and know how to apply them across various types of printed products.</td>
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<tr>
<td>A3.4</td>
<td>Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.</td>
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<td>A3.5</td>
<td>Produce a printed product that demonstrates the application of graphic design principles and color theory using desktop publishing and electronic imaging software.</td>
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<tr>
<td>A4.0</td>
<td>Demonstrate technical illustration and vector drawing skills.</td>
</tr>
<tr>
<td>A4.1</td>
<td>Create technical illustration and vector drawings.</td>
</tr>
<tr>
<td>A4.2</td>
<td>Convert and edit formats including encapsulated postscript (eps), drawing (dwg), and portable document file (pdf).</td>
</tr>
<tr>
<td>A6.0</td>
<td>Apply the processes and procedures involved in producing image files for the reproduction of single-color and multicolor products.</td>
</tr>
<tr>
<td>A6.1</td>
<td>Identify the variables that affect the image transfer process for reproduction.</td>
</tr>
<tr>
<td>A6.2</td>
<td>Employ the process for creating image files that are appropriate for graphic design reproduction and specified printing requirements.</td>
</tr>
<tr>
<td>A7.0</td>
<td>Develop a proficiency in applying the processes and procedures required for the reproduction of printed products and the image transfer process.</td>
</tr>
</tbody>
</table>
• A7.1 Explain how various processes may be used to produce multiple-imaged copies.
• A7.2 Identify the variables that affect the image transfer process.
• A7.3 Produce a single-color and multicolor quality project applying the procedures and image transfer processes with a minimum of waste.
• A9.0 Demonstrate an understanding of the screen-printing process.
• A9.1 Identify the various applications of screen printing and the outcomes it produces.
• A9.2 Identify materials and operations used in the screen-printing process.
• A9.3 Identify the variables that affect the image and results of the screening process. A9.4 Produce a screen-printed product on various substrates using appropriate inks and procedures.
• A10.0 Understand the analog and digital photographic applications.
• A10.1 Employ various photographic technology, processes, and materials used in graphic design.
• A10.2 Identify the visual characteristics and differences between analog and digital outputs.
• A10.3 Apply the principles of composition and lighting used in photography.
• A10.4 Produce black-and-white and color images under natural and studio lighting conditions in both analog and digital output.
• A13.0 Understand and apply integrated graphic multimedia technologies, combining graphics, photographic imagery, motion graphics and animation, video, and special effects.
• A13.1 Apply design strategies in selecting graphic multimedia technologies to produce dynamic effective visual communication.
• A13.2 Practice the steps in producing an integrated graphic multimedia project designed to inform, teach, or sell.
• A13.3 Produce an integrated graphic multimedia project.
● A14.0 Identify the different industries that utilize graphic design and identify other potential business opportunities for graphic design applications.
● A14.1 Apply research methodologies and business and entrepreneurial principles to identify potential business opportunities to apply graphic and multimedia design.

**California Arts Standards for Visual Arts:**

● Acc.VA:Cr1.1: Individually or collaboratively formulate new creative problems based on students’ existing artwork.
● Prof.VA:Cr1.1: Use multiple approaches to begin creative endeavors.
● Acc.VA:Cr2.1: Through experimentation, practice, and persistence, demonstrate acquisition of skills and knowledge in a chosen art form.
● Prof.VA:Cr3: Apply relevant criteria from traditional and contemporary cultural contexts to examine, reflect on, and plan revisions for works of art and design in progress.
## Unit 8: Prototype Presentations

### Unit Description
Individually or in their skatepark team, students will create a presentation of both their skatepark and their skateboards. Following a template of presentation topics, students will present both the physical skateboard and the skatepark design to faculty, students, administration, and industry partners.

<table>
<thead>
<tr>
<th>Standards</th>
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<th>Essential Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Core State Standards English Language Arts &amp; Literacy:</strong></td>
<td>Students will…</td>
<td>1. What is it like to try and market a creation that you made?</td>
</tr>
<tr>
<td>● Reading Standard: Cite specific textual evidence to support analysis of</td>
<td>● convey information about the students’ design of both the skateboard and the skatepark.</td>
<td>2. How can designers present their products in professional and engaging ways?</td>
</tr>
<tr>
<td>science and technical texts, attending to the precise details of</td>
<td>● discuss the design process, including obstacles and successes.</td>
<td></td>
</tr>
<tr>
<td>explanations or descriptions. (CCSS.ELA-LITERACY.RST.9-10.1)</td>
<td>● discuss usability of both designs in the community.</td>
<td></td>
</tr>
<tr>
<td>● Reading Standard: Follow precisely a complex multistep procedure when</td>
<td>● discuss skills that they had to utilize in order to complete these projects.</td>
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<tr>
<td>carrying out experiments, taking measurements, or performing technical</td>
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<tr>
<td>tasks; analyze the specific results based on explanations in the text.</td>
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<tr>
<td>(CCSS.ELA-LITERACY.RLST.11-12.3)</td>
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<tr>
<td>● Writing Standard: Use technology, including the Internet, to produce,</td>
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<tr>
<td>publish, and update individual or shared writing products in response to</td>
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<tr>
<td>ongoing feedback, including new arguments or information. (CCSS.ELA-</td>
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</tr>
<tr>
<td>LITERACY.W.11-12.6)</td>
<td></td>
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<td>● Writing Standard: Gather relevant information from multiple authoritative</td>
<td></td>
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<tr>
<td>print and digital sources using advanced searches effectively; assess the</td>
<td></td>
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<tr>
<td>strengths and limitations of each source in terms of the task, purpose,</td>
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<tr>
<td>and audience; integrate information into the text selectively to maintain</td>
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<tr>
<td>the flow of ideas, avoiding plagiarism and overreliance on any one source</td>
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<tr>
<td>and following a standard format for citation including footnotes and</td>
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<tr>
<td>endnotes. (CCSS.ELA-LITERACY.W.11-12.8)</td>
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</tr>
</tbody>
</table>

### Sample Performance Tasks/Assessments
- Students will present to an audience their approach to design thinking when creating a skateboard and a skatepark.
- Students will give and receive feedback about their designs.

### Manufacturing and Product Development - Knowledge and Performance Anchor Standards:
- 4.0 Technology: Use existing and emerging technology, to investigate, research, and produce products and services, including new information, as required in the Manufacturing and Product Design sector workplace environment.
- 5.0 Problem Solving and Critical Thinking: Conduct short, as well as more sustained, research to create alternative solutions
to answer a question or solve a problem unique to the Manufacturing and Product Design sector using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques

- 7.0 Responsibility and Flexibility: Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Manufacturing and Product Design

- 10.0 Technical Knowledge and Skills: Apply essential technical knowledge and skills common to all pathways in the Manufacturing and Product Design sector, following procedures when carrying out experiments or performing technical tasks.

- 11.0 Demonstrate and apply the knowledge and skills contained in the Manufacturing and Product Design anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through career technical student organizations.

**Graphic Production Technologies Pathway Standards:**

- A1.0 Apply the basic graphic design principles to achieve effective visual communication.

- A1.1 Identify the relationships between space, color, image, and content.

- A1.2 Demonstrate the graphic design principles and the utilization of the grid system in applying those principles.

- A1.3 Create a basic layout applying images, text, and typography.

- A1.4 Create and choose font styles.

- A2.0 Demonstrate an understanding of the psychology of color and color theory as it relates to visual communication.

- A2.1 Understand the science of color spectrum and other aspects of color as it relates to hue, value, and chroma.

- A2.2 Explain the differences between methods used to describe color, including cyan, magenta, yellow, black (CMYK) and red, green, blue (RGB).

- A2.3 Produce a printed product in monotone and in multicolor.
- A3.0 Apply graphic design software and desktop publishing as a means of creating effective communication.
- A3.1 Differentiate between and operate Macintosh (Mac) and personal computer (PC) platforms for development.
- A3.2 Apply desktop publishing and electronic imaging software principles and processes used to prepare graphic design products.
- A3.3 Demonstrate how to produce single and multicolor images and know how to apply them across various types of printed products.
- A3.4 Create a visually effective layout that communicates an intention using graphic software that integrates graphics, text, photographic imagery, and color.
- A3.5 Produce a printed product that demonstrates the application of graphic design principles and color theory using desktop publishing and electronic imaging software.
- A6.0 Apply the processes and procedures involved in producing image files for the reproduction of single-color and multicolor products.
- A6.1 Identify the variables that affect the image transfer process for reproduction.
- A6.2 Employ the process for creating image files that are appropriate for graphic design reproduction and specified printing requirements.
- A7.0 Develop a proficiency in applying the processes and procedures required for the reproduction of printed products and the image transfer process.
- A7.1 Explain how various processes may be used to produce multiple-imaged copies.
- A7.2 Identify the variables that affect the image transfer process.
- A7.3 Produce a single-color and multicolor quality project applying the procedures and image transfer processes with a minimum of waste.
- A9.0 Demonstrate an understanding of the screen-printing process.
- A9.1 Identify the various applications of screen printing and the outcomes it produces.
- A9.2 Identify materials and operations used in the screen-printing process.
- A9.3 Identify the variables that affect the image and results of the screening process. A9.4 Produce a screen-printed product on various substrates using appropriate inks and procedures.
- A13.1 Apply design strategies in selecting graphic multimedia technologies to produce dynamic effective visual communication.
- A13.2 Practice the steps in producing an integrated graphic multimedia project designed to inform, teach, or sell.
- A13.3 Produce an integrated graphic multimedia project.
- A14.0 Identify the different industries that utilize graphic design and identify other potential business opportunities for graphic design applications.
- A14.1 Apply research methodologies and business and entrepreneurial principles to identify potential business opportunities to apply graphic and multimedia design.

**California Arts Standards for Visual Arts:**
- Acc.VA:Cr1.1: Individually or collaboratively formulate new creative problems based on students’ existing artwork.
- Prof.VA:Cr1.1: Use multiple approaches to begin creative endeavors.
- Acc.VA:Cr2.1: Through experimentation, practice, and persistence, demonstrate acquisition of skills and knowledge in a chosen art form.
- Prof.VA:Cr3: Apply relevant criteria from traditional and contemporary cultural contexts to examine, reflect on, and plan revisions for works of art and design in progress.