Mission and Vision

We relentlessly pursue, with optimism, equitable support for all students to navigate a changing world by providing rigorous and relevant learning experiences that strengthen their capacity as

- Open-minded and invested collaborators;
- Effective and thoughtful communicators;
- Resourceful and creative problem solvers;
- Curious and analytical critical thinkers;
- Informed and compassionate community members.

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/eldstndspublication14.pdf](https://www.cde.ca.gov/sp/el/er/documents/eldstndspublication14.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](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/](https://www.cde.ca.gov/sp/el/rm/)

Escondido Union High School District prohibits discrimination, harassment, intimidation, and bullying based on actual or perceived ancestry, age, color, disability, gender, gender identity, gender expression, nationality, race or ethnicity, religion, sex, sexual orientation, pregnancy, marital or parental status or association with a person or group with one or more of these actual or perceived characteristics.

Dr. Courtney Goode, Assistant Superintendent of Human Resources, Equity and Title IX Compliance Officer
302 N. Midway Drive, Escondido, CA 92027
Office: (760) 291-3281, Email: cgoode@euhsd.org
Course Description

Advanced Wood Innovation & Design will use the introductory course, Wood Innovation & Design, as a foundation. Students will continue to create and design products that are related to woodworking. Students will demonstrate capacity in language arts, mathematics, and scientific knowledge and skills required to pursue the full range of post-secondary and career opportunities by solving problems using critical thinking skills (analyze, synthesize, and evaluate). Students will work independently and in teams to learn how to problem-solve, ideate, collaborate, research, utilize critical thinking, and present (visually and verbally) a complete product that they have built themselves using design, math, computers, tools, and machines to prepare for employment in woodworking. This course is academically rigorous and involves reading, research, and writing of design proposals and use of math in building prototypes. Students use problem-solving with laboratory/shop work by creating working prototypes of their products. Students use analytical thinking and factual content to research, problem-solve, and create working products. This is the capstone course in a pathway of courses designed to engage students and develop college and career readiness skills within the Building and Construction Trades Industry Sector. *Students who repeat this course will participate in new standards-aligned tasks designed to build upon the knowledge and skills from the previous year.

Course Information

| Semester A: | Course Number: 6480 | Transcript Abbreviation: ADV WOOD DSGN A (P) | Credits: 5 | Weighted: No |
| Semester B: | Course Number: 6481 | Transcript Abbreviation: ADV WOOD DSGN B (P) | Credits: 5 | Weighted: No |

Course Requirements

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

| 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): Wood Innovation & Design |
| 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

Unit 1: Design & Build a Realistic Movie Prop

Unit Description
Students will design and build a realistic movie prop. Students start by researching books, online, and retail spaces to generate multiple product ideas on what kinds of movie props exist, how they work, what they are made of, and how they are made. They then refine their ideas using critical thinking and come up with one unique realistic movie prop to produce. Using computers or by hand, the students will draw, draft, and sketch their idea using accurate measurements, math, materials, and processes. Then, they will create a timeline for completion. Students will then start to build a working realistic movie prop, considering electronics, lights, components, manufacturability, cost, and finishes, and using a variety of tools (lathe, 3D printer, saws, drills, CNC, laser, etc.). When completed, students will present their finished realistic movie prop to the class including idea research, sketches, drawings, finished product, and receive feedback. The focus of this unit is on identifying how the available materials, tools, and machinery can be leveraged to create an object that meets a specific purpose.

Unit Outline

<table>
<thead>
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<tbody>
<tr>
<td><strong>Common Core State Standards English Language Arts &amp; Literacy:</strong></td>
<td>Students will…</td>
<td>1. What is the function of this product?</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. (<strong>CCSS.ELA-LITERACY.RST.9-10.1</strong>)</td>
<td>● research products available in the desired market.</td>
<td>2. How can the product be improved upon?</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. (<strong>CCSS.ELA-LITERACY.RLST.11-12.3</strong>)</td>
<td>● design a prototype using drawings or design software.</td>
<td>3. Will this ideation of this product be cost effective to manufacture?</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. (<strong>CCSS.ELA-LITERACY.RLST.11-12.4</strong>)</td>
<td>● compare and contrast prototype with current available designs.</td>
<td>4. How could this new product be marketed?</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. (<strong>CCSS.ELA-LITERACY.W.11-12.2.D</strong>)</td>
<td>● build a prototype using available materials, tools, and machinery.</td>
<td>5. Does this new product meet market and industry needs?</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. (<strong>CCSS.ELA-LITERACY.W.11-12.4</strong>)</td>
<td>● receive feedback for potential design.</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. (<strong>CCSS.ELA-LITERACY.W.11-12.6</strong>)</td>
<td></td>
<td></td>
</tr>
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</table>

Sample Performance Tasks/Assessments
- Working individually, students will research a product design and create a project proposal that will include design concept, a drawn rendering of product, and manufacturing plan. Once the design is accepted, students will use necessary materials and various machines and tools to create a prototype. Prototypes will be presented verbally and visually to class for feedback on design.
• **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)

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

**Residential and Commercial Construction Pathway Standards:**

- **D2.0** Apply the appropriate mathematical calculations used in the construction trades.
- **D2.1** Apply formulas to determine area, volume, lineal, board, and square feet.
- **D2.2** Apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for square.
● D2.3 Estimate the materials needed to complete a specific task.

● D3.0 Interpret and apply information from technical drawings, schedules, and specifications used in the construction trades.

● D3.1 Identify the elements used in technical drawings, including types of lines, symbols, details, and views.

● D3.2 Identify and interpret the elements of technical drawings, including plan, elevation, section, and detail views.

● D3.3 Interpret technical drawings specifications.

● D3.4 Identify plumbing, electrical, and mechanical symbols and other abbreviations used in construction drawings.

● D3.5 Interpret and scale dimensions from a set of plans using an architect’s scale.

● D3.6 Interpret sectional and detail drawings to determine construction details such as corners, rough openings, stairs, and roof systems.

● D3.7 Understand the sequencing and phases of residential and commercial construction projects.

● D9.0 Understand, integrate, and employ sustainable construction practices in the building trades.

● D9.1 Identify design and energy solutions for improving building energy efficiency.

● D9.2 Identify materials used in building construction to increase energy efficiency and sustainability.

● D9.3 Calculate energy requirements and loads for buildings and structures.

● D9.4 Demonstrate the application of constructing materials intended to improve building efficiency and sustainability.

● D9.5 Analyze and evaluate buildings for energy efficiency and performance.

● D9.6 Develop solutions to improve building energy performance and efficiency.

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: Design & Build a Working Lamp

### Unit Description

Students will design and build a working lamp. Students start by researching books, online, and retail spaces to generate multiple product ideas on what kinds of lamps exist, how they work, what they are made of, and how they are made. They then refine their ideas using critical thinking and come up with one unique working lamp to produce. Using computers or by hand, the students will draw, draft, and sketch their idea using accurate measurements, math, materials, and processes. Then, they will create a timeline for completion. Students then start to build a working lamp, considering electronics, lights, components, manufacturability, cost, and finishes, and using a variety of tools (lathe, 3D printer, saws, drills, CNC, laser, etc.). When completed, students will present their finished working lamp to the class including idea research, sketches, drawings, finished product, and receive feedback. The focus of this unit is on artistic form, shape, and attention to detail, with a focus on the intersection between aesthetics and functionality.

### Unit Outline

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<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. (<a href="https://www.corestandards.org/">CCSS.ELA-LITERACY.RST.9-10.1</a></td>
<td>Students will...</td>
<td>1. How can the product be designed in a way that is aesthetically pleasing to the end user, but that retains its functionality?</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. (<a href="https://www.corestandards.org/">CCSS.ELA-LITERACY.RLST.11-12.3</a>)</td>
<td>• design a prototype using drawings or design software, considering aesthetics and artistry.</td>
<td>2. How could this product be marketed?</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. (<a href="https://www.corestandards.org/">CCSS.ELA-LITERACY.RLST.11-12.4</a>)</td>
<td>• compare and contrast the idea developed with current available designs.</td>
<td>3. What changes to a product can be made in order for it to be marketable as an art form?</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. (<a href="https://www.corestandards.org/">CCSS.ELA-LITERACY.W.11-12.2.D</a>)</td>
<td>• build a prototype which integrates artistic elements of form and shape.</td>
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<td>• <strong>Writing Standard:</strong> Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. (<a href="https://www.corestandards.org/">CCSS.ELA-LITERACY.W.11-12.4</a>)</td>
<td><strong>Sample Performance Tasks/Assessments</strong></td>
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<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. (<a href="https://www.corestandards.org/">CCSS.ELA-LITERACY.W.11-12.6</a>)</td>
<td>• Working individually, students will research a product design and create a project proposal that will include design concept, a drawn rendering of product, and manufacturing plan. Students will research and integrate a variety of artistic concepts and their application in the maker space for this product class (form, shape, detailing). Once the design is accepted, students will use necessary materials and various machines and tools to create a prototype, which will be crafted in a way that integrates the selected artistic elements. Prototypes will be presented verbally and visually to class for feedback on design. Students will reflect on the intersection between aesthetics and functionality.</td>
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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)

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

**Residential and Commercial Construction Pathway Standards:**

- **D2.0** Apply the appropriate mathematical calculations used in the construction trades.
- **D2.1** Apply formulas to determine area, volume, lineal, board, and square feet.
- **D2.2** Apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for square.
- **D2.3** Estimate the materials needed to complete a specific task.
- **D3.0** Interpret and apply information from technical drawings, schedules, and specifications used in the construction trades.
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<td>D3.2 Identify and interpret the elements of technical drawings, including plan, elevation, section, and detail views.</td>
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<td>D3.5 Interpret and scale dimensions from a set of plans using an architect’s scale.</td>
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<td>D3.6 Interpret sectional and detail drawings to determine construction details such as corners, rough openings, stairs, and roof systems.</td>
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<td>D3.7 Understand the sequencing and phases of residential and commercial construction projects.</td>
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<td>D9.0 Understand, integrate, and employ sustainable construction practices in the building trades.</td>
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<td>D9.1 Identify design and energy solutions for improving building energy efficiency.</td>
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<td>D9.2 Identify materials used in building construction to increase energy efficiency and sustainability.</td>
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<tr>
<td>D9.3 Calculate energy requirements and loads for buildings and structures.</td>
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<td>D9.4 Demonstrate the application of constructing materials intended to improve building efficiency and sustainability.</td>
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<td>D9.5 Analyze and evaluate buildings for energy efficiency and performance.</td>
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<td>D9.6 Develop solutions to improve building energy performance and efficiency.</td>
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**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.
### Unit 3: Design & Build a Piece of Furniture

#### Unit Description

Students will design and build a piece of furniture. Students start by researching books, online, and retail spaces to generate multiple product ideas on what kinds of furniture exist, how they work, what they are made of, and how they are made. They then refine their ideas using critical thinking and come up with one unique piece of furniture to produce. Using computers or by hand, the students will draw, draft, and sketch their idea using accurate measurements, math, materials, and processes. Then, they will create a timeline for completion. Students then start to build a piece of furniture, considering electronics, lights, components, manufacturability, cost, and finishes, and using a variety of tools (lathe, 3D printer, saws, drills, CNC, laser, etc.). When completed, students will present their finished piece of furniture to the class including idea research, sketches, drawings, finished product, and receive feedback. The focus of this unit is on functionality and attention to detail.

#### Unit Outline

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<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. What is the function of this product?</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.RST.11-12.3)</td>
<td></td>
<td>2. How can the product be improved upon?</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.RST.11-12.4)</td>
<td></td>
<td>3. What makes an item of this type “functional?”</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>
<td>4. Which types of details are key to successful creation and marketing of this product?</td>
</tr>
<tr>
<td>• <strong>Writing Standard:</strong> 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>
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<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>
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</table>

#### Sample Performance Tasks/Assessments

- Working individually, students will research a product design and create a project proposal that will include design concept, a drawn rendering of product, and manufacturing plan. Once the design is accepted, students will use necessary materials and various machines and tools to create a prototype. Prototypes will be presented verbally and visually to class for feedback on design. Students will reflect on how functionality and attention to detail impact the usability of their product.
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)

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

**Residential and Commercial Construction Pathway Standards:**

- **D2.0** Apply the appropriate mathematical calculations used in the construction trades.
- **D2.1** Apply formulas to determine area, volume, lineal, board, and square feet.
- **D2.2** Apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for square.
- **D2.3** Estimate the materials needed to complete a specific task.
- **D3.0** Interpret and apply information from technical drawings, schedules, and specifications used in the construction trades.
- **D3.1** Identify the elements used in technical drawings, including types of lines, symbols, details, and views.
- D3.2 Identify and interpret the elements of technical drawings, including plan, elevation, section, and detail views.
- D3.3 Interpret technical drawings specifications.
- D3.4 Identify plumbing, electrical, and mechanical symbols and other abbreviations used in construction drawings.
- D3.5 Interpret and scale dimensions from a set of plans using an architect’s scale.
- D3.6 Interpret sectional and detail drawings to determine construction details such as corners, rough openings, stairs, and roof systems.
- D3.7 Understand the sequencing and phases of residential and commercial construction projects.
- D9.0 Understand, integrate, and employ sustainable construction practices in the building trades.
- D9.1 Identify design and energy solutions for improving building energy efficiency.
- D9.2 Identify materials used in building construction to increase energy efficiency and sustainability.
- D9.3 Calculate energy requirements and loads for buildings and structures.
- D9.4 Demonstrate the application of constructing materials intended to improve building efficiency and sustainability.
- D9.5 Analyze and evaluate buildings for energy efficiency and performance.
- D9.6 Develop solutions to improve building energy performance and efficiency.

**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: Design & Build a Futuristic Vehicle

Unit Description

Students will design and build a futuristic vehicle. Students start by researching books, online, and retail spaces to generate multiple product ideas on what kinds of vehicles exist, how they work, what they are made of, and how they are made. They then refine their ideas using critical thinking and come up with one unique futuristic vehicle to produce. Using computers or by hand, the students will draw, draft, and sketch their idea using accurate measurements, math, materials, and processes. Then, they will create a timeline for completion. Students then start to build a futuristic vehicle, considering electronics, lights, components, manufacturability, cost, and finishes, and using a variety of tools (lathe, 3D printer, saws, drills, CNC, laser, etc.). When completed, students will present their finished futuristic vehicle to the class including idea research, sketches, drawings, finished product, and receive feedback. The focus of this unit is on the intersection between movement, style, and functionality.

Unit Outline

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<td>Students will…</td>
<td>1. How can free movement be ensured with an end product using our tools and materials?</td>
</tr>
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<td>- study movement and identify how shop tools might be used to ensure (and not impede) free movement.</td>
<td>2. What ornamental elements are consistent with desired styles for this product?</td>
</tr>
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<td>- design a prototype using drawings or design software with a focus on style and ornamental elements.</td>
<td></td>
</tr>
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<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. (<a href="#">CCSS.ELA-LITERACY.W.11-12.D</a>)</td>
<td>- build a functional prototype demonstrating stylistic elements.</td>
<td></td>
</tr>
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Sample Performance Tasks/Assessments

- Working individually, students will research a product design and create a project proposal that will include design concept, a drawn rendering of product, and manufacturing plan. Once the design is accepted, students will use necessary materials and various machines and tools to create a prototype. Prototypes will be presented verbally and visually to class for feedback on design. Students will reflect on the intersection between movement, style, and functionality.
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)

**Building and Construction Trades - Knowledge and Performance Anchor Standards:**

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

**Residential and Commercial Construction Pathway Standards:**

- **D2.0** Apply the appropriate mathematical calculations used in the construction trades.
- **D2.1** Apply formulas to determine area, volume, lineal, board, and square feet.
- **D2.2** Apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for square.
- **D2.3** Estimate the materials needed to complete a specific task.
- **D3.0** Interpret and apply information from technical drawings, schedules, and specifications used in the construction trades.
- D3.1 Identify the elements used in technical drawings, including types of lines, symbols, details, and views.
- D3.2 Identify and interpret the elements of technical drawings, including plan, elevation, section, and detail views.
- D3.3 Interpret technical drawings specifications.
- D3.4 Identify plumbing, electrical, and mechanical symbols and other abbreviations used in construction drawings.
- D3.5 Interpret and scale dimensions from a set of plans using an architect’s scale.
- D3.6 Interpret sectional and detail drawings to determine construction details such as corners, rough openings, stairs, and roof systems.
- D3.7 Understand the sequencing and phases of residential and commercial construction projects.
- D9.0 Understand, integrate, and employ sustainable construction practices in the building trades.
- D9.1 Identify design and energy solutions for improving building energy efficiency.
- D9.2 Identify materials used in building construction to increase energy efficiency and sustainability.
- D9.3 Calculate energy requirements and loads for buildings and structures.
- D9.4 Demonstrate the application of constructing materials intended to improve building efficiency and sustainability.
- D9.5 Analyze and evaluate buildings for energy efficiency and performance.
- D9.6 Develop solutions to improve building energy performance and efficiency.

**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: Design & Build a Working Ukulele or Guitar (Electric or Acoustic)

Unit Description

Students will design and build a working ukulele or guitar (electric or acoustic). Students start by researching books, online, and retail spaces to generate multiple product ideas on what kinds of string instruments exist, how they work, what they are made of, and how they are made. They then refine their ideas using critical thinking and come up with one unique working ukulele or guitar to produce. Using computers or by hand, the students will draw, draft, and sketch their idea using accurate measurements, math, materials, and processes. Then, they will create a timeline for completion. Students then start to build a working ukulele or guitar, considering electronics, components, manufacturability, cost, and finishes, and using a variety of tools (lathe, 3D printer, saws, drills, CNC, laser, etc.). When completed, students will present their finished working ukulele or guitar to the class including idea research, sketches, drawings, finished product, and receive feedback. The focus of this unit is on artistic form, shape, and attention to detail; this unit is also interdisciplinary with science (sound waves).

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)

<table>
<thead>
<tr>
<th>Standards</th>
<th>Learning Objectives</th>
<th>Essential Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students will…</td>
<td></td>
<td>1. How does this item make sound?</td>
</tr>
<tr>
<td>• study the science behind sound.</td>
<td>2. Will this ideation of this product make the intended sound?</td>
<td></td>
</tr>
<tr>
<td>• design and build a working prototype which meets aesthetic and sound criteria.</td>
<td>3. How could this new product be marketed?</td>
<td></td>
</tr>
<tr>
<td>• receive feedback on the prototype and reflect on how feedback might help inform a successful final project.</td>
<td>4. Does this ideation of the product meet market and industry needs?</td>
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Sample Performance Tasks/Assessments

- Working individually, students will research a product design and create a project proposal that will include design concept, a drawn rendering of product, and manufacturing plan. Once the design is accepted, students will use necessary materials and various machines and tools to create a prototype. Prototypes will be presented verbally and visually to class for feedback on design. Students will reflect on artistic form, shape, and attention to detail, as well as how their design supports their knowledge of sound science.
- **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)

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

### Residential and Commercial Construction Pathway Standards:

- **D2.0** Apply the appropriate mathematical calculations used in the construction trades.
- **D2.1** Apply formulas to determine area, volume, lineal, board, and square feet.
- **D2.2** Apply the Pythagorean Theorem to calculate pipe offsets, roof slope, and check for square.
- **D2.3** Estimate the materials needed to complete a specific task.
- **D3.0** Interpret and apply information from technical drawings, schedules, and specifications used in the construction trades.
- D3.1 Identify the elements used in technical drawings, including types of lines, symbols, details, and views.
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- D3.6 Interpret sectional and detail drawings to determine construction details such as corners, rough openings, stairs, and roof systems.
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Unit 6: Design a Product for a Company

Unit Description
If students have been successful on their previous products, they are open to research and contact a company of their choice and request to design a product for them. Students will design and build a product for that company. Students start by researching companies they would like to design a product for and have meetings and emails correspondence to discuss the scope of the project. Then, they will begin the design process by researching books, online, and retail spaces to generate multiple product ideas on what kinds of products exist, how they work, what they are made of, and how they are made. They then refine their ideas using critical thinking and come up with one unique product to produce. Using computers or by hand, the students will draw, draft, and sketch their idea using accurate measurements, math, materials, and processes. Then, they will create a timeline for completion. Students keep consistent communication with the company showing progress, questions, etc. as they build, considering electronics, lights, components, manufacturability, cost, and finishes, and using a variety of tools (lathe, 3D printer, saws, drills, CNC, laser, etc.). When completed, students will present their finished product to the company and class including idea research, sketches, drawings, and finished product, and receive feedback.

Unit Outline

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<td>Students will…</td>
<td>1. What is the function of this product?</td>
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<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>- research products available in the desired market.</td>
<td>2. How can the product be improved upon?</td>
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<td>- design a prototype using drawings or design software.</td>
<td>3. Will this ideation of this product be cost effective to manufacture?</td>
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<td>- compare and contrast prototype with current available designs.</td>
<td>4. How could this new product be marketed?</td>
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<td>- build a prototype using available materials, tools, and machinery.</td>
<td>5. Does this ideation of the product meet market and industry needs?</td>
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<td>- receive feedback for potential design.</td>
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