

 

District Name: Lopez Island School District

**Course Title: Woodworking**

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| **School District Name** | | |
| **Course Title:** Woodworking | | **Total Framework Hours:** 180 |
| **CIP Code:** 480701 | **X Exploratory ☐ Preparatory** | **Date Last Modified:** June, 2021 |
| **Career Cluster:** STEM | | **Cluster Pathway:** Engineering and Technology |
| **Course Summary**:  This course offers an overview of woodworking trades, materials, tools, 3D modeling/planning platforms, and assembly techniques. Within a project based learning format/pedagogy, students are introduced to safety protocols and appropriate application of a variety of hand and power tools used regularly in the carpentry trades. Students are guided through the preparation and assembly of several small projects requiring the use of specific materials and tools with emphasis on safety, skill development, and quality craftsmanship. After the demonstration of proficiency, each student self selects at least one design/build project at the end of the year.  Students may choose to repeat this course as many times as they like resulting in a wide range of skill sets within one group of students. The following focus areas are tailored to the skills and interests of each group of students enrolled and end up being highly differentiated based on existing skill sets.  Four Focus Areas:   1. Trade Talks: Students research a variety of woodworking trades. Students prepare for and conduct interviews with various local professionals in trades of interest. (i.e. Material Sourcing, Tree Felling/Arborist, Milling, Carving, Instrument Making, Cabinetry, Finish Carpentry, Construction, Design Build etc.) 2. Measurement, Safety, and Hand Tools: Students are introduced to and develop mastery of skills related to measurement, shop safety, and a variety of hand tools through the assembly of a small project. 3. Materials and Machines: Students explore material sourcing and selection for projects that require the use of larger table and floor mounted woodworking machines. 4. Design/Build: Students design and build a project in an application of skills they have been developing over the course of the year. This project can take on various forms:    1. [Large Scale](https://www.thesprucecrafts.com/free-woodworking-plans-for-your-home-and-yard-1357146): completed as a whole group. (i.e. shed, set piece, chicken coop, etc.)    2. [Medium Scale](https://www.familyhandyman.com/list/40-outdoor-woodworking-projects-for-beginners/): completed in small groups/teams. (i.e. cabinetry, furniture, shelving, etc.)    3. [Small Scale](https://www.rockler.com/free-woodworking-plans): completed individually. (i.e. small box, decorative shelving, skate board, etc.) | | |
| **Eligible for Equivalent Credit in:** Geometry? | | **Total Number of Units:** 1.0 Credits |
| **Course Resources:**   1. San Juan County Economic Development Council (SJCEDC) 2. Home Builders Institute (HBI); Pre-Apprentice Certificate Training (PACT) Curriculum 3. Local Construction Companies and Woodworkers 4. Kansas City Woodworkers Guild: http://kcwoodworkersguild.org/ 5. SketchUp (Web Based 3D Modeling Program) | | |

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| Unit 1: Trade Talks | | | | **Total Learning Hours for Unit:** 20 |
| **Unit Summary**: Students consider the supply and demand of woodworking trades in the San Juan Islands and will...   * Research a trade of focus, zooming in on a local professional/business * Prepare for and conduct an informational interview a local woodworker active in the field of focus regarding their:   + Work Experience/Job Satisfaction   + Ethics/Responsibilities   + Pay/Compensation   + Education/Training   + Hiring Practices * Reflect on their interview and compile a list of relevant learning objectives for the remainder of this course based findings from interviewing local woodworkers. * Field trip to an applicable site of interest; job site, personal/professional workshop, lumber mill, firm office, etc. | | | | |
| **Performance Assessments**:   1. Trade Research Paper (individual) 2. Trade Research Presentation (small group) 3. Interview Questions (pairs) 4. Interview/Interviewee Feedback (individual) 5. Reflection (individual) | | | | |
| **Leadership Alignment**: [Washington CTE 21st Century Leadership Skills](https://www.k12.wa.us/sites/default/files/public/careerteched/pubdocs/washingtoncteleadershipskills.pdf) Think Creatively  1.A.1: Use a wide range of idea creation techniques (such as brainstorming)  1.B.2: Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work  Communicate Clearly  3.A.2: Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions  Access and Evaluate Information  4.A.2: Evaluate information critically and competently  Use and Manage Information  4.B.2: Manage the flow of information from a wide variety of sources  Apply Technology Effectively  6.A.1: Use technology as a tool to research, organize, evaluate and communicate information  Manage Goals and Time  8.A.3 Utilize time and manage workload efficiently  Interact Effectively with Others  9.A.1 Know when it is appropriate to listen and when to speak  9.A.2 Conduct themselves in a respectable, professional manner  Produce Results  10.B.1 Demonstrate additional attributes associated with producing high quality products including the abilities to:  10.B.1.a Work positively and ethically  10.B.1.b Manage time and projects effectively  10.B.1.c Multi-task  10.B.1.d Participate actively, as well as be reliable and punctual  10.B.1.e Present oneself professionally and with proper etiquette  10.B.1.f Collaborate and cooperate effectively with teams  10.B.1.g Respect and appreciate team diversity  10.B.1.h Be accountable for results  Global Awareness  12.A.2 Learning from and working collaboratively with individuals representing diverse cultures, religions and lifestyles in a spirit of mutual respect and open dialogue in personal, work and community contexts  Civic Literacy  12.C.3 Understanding the local and global implications of civic decisions | | | | |
| **Industry Standards and/or Competencies**: [Residential Construction Industry Competency Model](https://www.careeronestop.org/CompetencyModel/competency-models/pyramid-download.aspx?industry=construction-residential) Interpersonal Skills  1.1.2 Interact respectfully with coworkers of different cultures, genders, and backgrounds  1.1.3 Work cooperatively with others on the job and display a good-natured attitude  Willingness to Learn  1.6.6 Take charge of personal career development by identifying occupational interests, strengths, and opportunities  1.6.7 Identify opportunities for career advancement and certification requirements  3.1 Teamwork: Work cooperatively with others to complete work assignments. | | | | |
| **Aligned Washington State Academic Standards** | | | | |
| **Arts** |  | | | |
| **Educational Technology** |  | | | |
| **Health Education** |  | | | |
| **Physical Education** |  | | | |
| **English Language Arts: Common Core** |  | | | |
| **Mathematics: Common Core** |  | | | |
| **Mathematical Practices** |  | | | |
| Science (NGSS) |  | | | |
| **Science and Engineering Practice** | | **Disciplinary Core Idea** | **Crosscutting Concept** | |
| 1. Defining problems  3. Planning and carrying out investigations  8. Obtaining, evaluating, and communicating information | |  | 1. Patterns. Observed patterns of forms and events guide organization and classification, and  they prompt questions about relationships and the factors that influence them.  2. Cause and effect: Mechanism and explanation. Events have causes, sometimes simple,  sometimes multifaceted. A major activity of science is investigating and explaining causal  relationships and the mechanisms by which they are mediated. Such mechanisms can then be  tested across given contexts and used to predict and explain events in new contexts.  5. Energy and matter: Flows, cycles, and conservation. Tracking fluxes of energy and matter  into, out of, and within systems helps one understand the systems’ possibilities and limitations.  7. Stability and change. For natural and built systems alike, conditions of stability and  determinants of rates of change or evolution of a system are critical elements of study. | |
| **Social Studies** |  | | | |
| **World Languages** |  | | | |

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| Unit 2: Measurement, Safety, and Hand Tools | | | | **Total Learning Hours for Unit:** 40 |
| **Unit Summary**: Students are introduced to and develop mastery of skills related to measurement, shop safety, and a variety of hand tools through the process of building a small project from a plan.   * Part I: Measurement   Students will be able to read a ruler to the nearest 16th of an inch, calculate (1) whole numbers, (2) fractions, and (3) decimals using addition, subtraction, multiplication, and division. Students will be able to add, subtract, multiply and divide measurements using measuring tools. Students will be able to calculate square foot and linear foot measurements. Students will be able to read and interpret basic construction plans/models and interpret basic architectural symbols and abbreviations. Students will be able demonstrate proper use of tools use to determine (1) square, (2) plumb, and (3) level.   * Part II: Safe working and workshop practices   Students will be able to describe and practice safe use of hand and power tools needed for their small project. Students will select and wear proper safety attire including personal protective equipment. Students will accept the responsibility of the personal safety of others and demonstrate the ability to report all injuries immediately to their teacher. Students will demonstrate their understanding and ability to address personal and shop safety rules via written and performance assessments. Students will be able to locate and appropriately use first aid, fire safety, and eyewash equipment. Students will be able demonstrate the ability to properly lift and carry construction materials.   * Part III: Hand Tools   Students will be able to demonstrate the proper use, care, and maintenance of hand tools. Students will be able to describe and perform the safety expectations for each hand tool. Students will be able to identify and select the appropriate hand tool(s) for specific tasks in carpentry as well as in painting and finishing. | | | | |
| **Performance Assessments**:   1. Hand Tool specific safety assessments (individual) 2. Hand Tool specific skills assessments (individual) 3. Small multi-step build project, evaluated by rubric    1. Prototype build (pairs)    2. Cut and assembly of small stool/tote (individual) | | | | |
| **Leadership Alignment**: [Washington CTE 21st Century Leadership Skills](https://www.k12.wa.us/sites/default/files/public/careerteched/pubdocs/washingtoncteleadershipskills.pdf) 8.A.3 Utilize time and manage workload efficiently  8.C.4 Reflect critically on past experiences in order to inform future progress  10.A.1 Set and meet goals, even in the face of obstacles and competing pressures  10.A.2 Prioritize, plan and manage work to achieve the intended result  10.B.1 Demonstrate additional attributes associated with producing high quality products including the abilities to:  10.B.1.a Work positively and ethically  10.B.1.b Manage time and projects effectively  10.B.1.c Multi-task  10.B.1.d Participate actively, as well as be reliable and punctual  10.B.1.e Present oneself professionally and with proper etiquette  10.B.1.f Collaborate and cooperate effectively with teams  10.B.1.g Respect and appreciate team diversity  10.B.1.h Be accountable for results | | | | |
| **Industry Standards and/or Competencies**: [Residential Construction Industry Competency Model](https://www.careeronestop.org/CompetencyModel/competency-models/pyramid-download.aspx?industry=construction-residential) Integrity  1.2.1 Apply ethical standards of the industry to workplace/jobsite conduct  1.2.2 Treat others with honesty, fairness, and respect  1.2.3 Demonstrate respect for property of customers, employer, and coworkers  1.2.4 Take responsibility for accomplishing work goals within accepted timeframes  1.2.5 Accept responsibility for one’s decisions and actions  Willingness to Learn  1.6.4 Accept help from supervisors and co-workers  1.6.5 Seek out feedback from others to improve job performance  4.2.3 Use  4.2.3.1 Handle, install, position, move, and store materials properly  4.2.3.2 Demonstrate knowledge of various material finishing techniques  4.2.3.3 Identify and perform material testing techniques  4.2.3.4 Understand appropriate transport methods of various construction materials  4.2.3.5 Use appropriate combinations of building materials and components | | | | |
| **Aligned Washington State Academic Standards** | | | | |
| **Arts** |  | | | |
| **Educational Technology** |  | | | |
| **Health Education** |  | | | |
| **Physical Education** |  | | | |
| **English Language Arts: Common Core** |  | | | |
| **Mathematics: Common Core** |  | | | |
| **Mathematical Practices** |  | | | |
| Science |  | | | |
| **Science and Engineering Practice** | | **Disciplinary Core Idea** | **Crosscutting Concept** | |
| 4. Analyzing and interpreting data  5. Using mathematics and computational thinking  8. Obtaining, evaluating, and communicating information | |  | 3. Scale, proportion, and quantity. In considering phenomena, it is critical to recognize what is  relevant at different measures of size, time, and energy and to recognize how changes in scale,  proportion, or quantity affect a system’s structure or performance.  4. Systems and system models. Defining the system under study—specifying its boundaries and  making explicit a model of that system—provides tools for understanding and testing ideas that  are applicable throughout science and engineering. | |
| **Social Studies** |  | | | |
| **World Languages** |  | | | |

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| Unit 3: Materials and Machines | | | | **Total Learning Hours for Unit:** 40 |
| **Unit Summary**: Students build upon their knowledge of hand tools through the process of sourcing and selecting material for a medium sized build project. Students select from a small group of project plans provided by their teacher. These projects are curated to fit the various skill sets present among students and require the use of larger table and floor mounted woodworking machines.  Students will be able to...   * Demonstrate the proper use, care, and maintenance of power tools and related equipment. * Describe and perform the safety expectations for each power tool. * Identify and select the appropriate power tool(s) for specific tasks in carpentry as well as in painting and finishing. * Identify local and regional waste and recycling processes for materials used in our woodshop. * Describe lumber defects * Describe standard lumber sizing * Translate measurement from paper to work environment. | | | | |
| **Performance Assessments**:   1. Power Tool specific safety assessments (individual) 2. Power Tool specific skills assessments (individual) 3. Medium multi-step build project, evaluated by rubric    1. Students select a project plan provided by the teacher based on skill and interest.    2. Cut and assembly are completed according to plan specifications.    3. Product is evaluated based on proper use of materials and tools with emphasis on safety, skill development, and quality craftsmanship. | | | | |
| **Leadership Alignment**: [Washington CTE 21st Century Leadership Skills](https://www.k12.wa.us/sites/default/files/public/careerteched/pubdocs/washingtoncteleadershipskills.pdf) 7.B.1 Incorporate feedback effectively  7.B.2 Deal positively with praise, setbacks and criticism  7.B.3 Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments  8.A.3 Utilize time and manage workload efficiently  8.B.1 Monitor, define, prioritize and complete tasks without direct oversight  8.C.2 Demonstrate initiative to advance skill levels towards a professional level  8.C.4 Reflect critically on past experiences in order to inform future progress  10.A.1 Set and meet goals, even in the face of obstacles and competing pressures  10.A.2 Prioritize, plan and manage work to achieve the intended result  10.B.1 Demonstrate additional attributes associated with producing high quality products including the abilities to:  10.B.1.a Work positively and ethically  10.B.1.b Manage time and projects effectively  10.B.1.c Multi-task  10.B.1.d Participate actively, as well as be reliable and punctual  10.B.1.e Present oneself professionally and with proper etiquette  10.B.1.f Collaborate and cooperate effectively with teams  10.B.1.g Respect and appreciate team diversity  10.B.1.h Be accountable for results | | | | |
| **Industry Standards and/or Competencies**: [Residential Construction Industry Competency Model](https://www.careeronestop.org/CompetencyModel/competency-models/pyramid-download.aspx?industry=construction-residential) Professionalism  1.3.1 Take pride in one’s work and the work of the organization  1.3.3 Accept criticism and deal calmly with stressful situations  1.3.4 Dress appropriately for the workplace/jobsite  Willingness to Learn  1.6.2 Learn new skills related to the job  1.6.5 Seek out feedback from others to improve job performance  1.6.6 Take charge of personal career development by identifying occupational interests, strengths, and opportunities  1.6.7 Identify opportunities for career advancement and certification requirements  3.4 Problem Solving and Decision Making: Apply critical-thinking skills to solve problems encountered on the work site.  3.5.1 Select and Use Tools and Technology  3.5.1.1 Identify the hand and power tools appropriate to the work site and to the trade  3.5.1.2 Select tools, technology, machinery, and equipment appropriate for a given job  3.5.1.3 Demonstrate appropriate use of tools to complete work functions  3.5.1.4 Identify potential hazards related to the use of tools  3.5.1.5 Operate hand or power tools and equipment in  3.7 Craftsmanship: Recognize the responsibilities and personal characteristics of a professional craftsperson.  4.1.1 Design  4.1.1.1 Recognize basic engineering and architectural principles in structures  4.1.1.2 Identify components of building systems needed to complete a construction project  4.1.1.3 Understand design techniques, tools, and principles involved in the production of precision technical plans, blueprints, drawings, and models  4.1.1.4 Interpret documentation, detailed instructions, drawings, or specifications about how devices, parts, equipment, or structures are to be fabricated, constructed, assembled, modified, maintained, or used  4.2.2 Selection  4.2.2.1 Evaluate and select building materials and assemblies to meet project specifications (e.g., metals, woods, ceramics, concrete, rubber, plastics, polymers, composites, etc.)  4.2.2.2 Understand criteria used for material selection | | | | |
| **Aligned Washington State Academic Standards** | | | | |
| **Arts** |  | | | |
| **Educational Technology** |  | | | |
| **Health Education** |  | | | |
| **Physical Education** |  | | | |
| **English Language Arts: Common Core** |  | | | |
| **Mathematics: Common Core** |  | | | |
| **Mathematical Practices** |  | | | |
| Science |  | | | |
| **Science and Engineering Practice** | | **Disciplinary Core Idea** | **Crosscutting Concept** | |
| 1. Defining problems  4. Analyzing and interpreting data  5. Using mathematics and computational thinking  8. Obtaining, evaluating, and communicating information | |  | 5. Energy and matter: Flows, cycles, and conservation. Tracking fluxes of energy and matter  into, out of, and within systems helps one understand the systems’ possibilities and limitations.  6. Structure and function. The way in which an object or living thing is shaped and its  substructure determine many of its properties and functions. | |
| **Social Studies** |  | | | |
| **World Languages** |  | | | |

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| Unit 4: Design/Build | | | | **Total Learning Hours for Unit:** 80 |
| **Unit Summary**: Students design and build a project in an application of skills they have been developing over the course of the year. This project can take on various forms: [Large Scale](https://www.thesprucecrafts.com/free-woodworking-plans-for-your-home-and-yard-1357146): completed as a whole group. (i.e. shed, set piece, chicken coop, etc.), [Medium Scale](https://www.familyhandyman.com/list/40-outdoor-woodworking-projects-for-beginners/): completed in small groups/teams. (i.e. cabinetry, furniture, shelving, etc.), [Small Scale](https://www.rockler.com/free-woodworking-plans): completed individually. (i.e. small box, decorative shelving, skate board, etc.)   * Part I: 3D Modeling and Design in SketchUp   Students will be able to generate a three-dimensional model of a project design that they would like to build using SketchUp.   * Part II: Material sourcing, preparation, cut, and assembly   Students will be able to demonstrate carpentry safety practices. Students will be able to identify basic carpentry hand and power tools, their function, and how to use these tools safely for an appropriate purpose. Students will be able to identify and select appropriate anchors and fasteners for specific applications in their project.     * Part III: Painting and Finishing   Students will understand and be able to demonstrate the safe and proper use of painting tools and equipment. Students will be able to explain basic painting theories and discuss different specialty finishes and their application. Students will be able to identify and select tools and materials used to protect surfaces. STudents will be able to describe and demonstrate the importance of proper cleanup. Students will be able to describe and demonstrate the different methods of preparing new and previously painted wood surfaces. Students will be able to identify and use various sealants and fillers for appropriate tasks. | | | | |
| **Performance Assessments**:   1. Completed 3D SketchUp model of tutorial based project. 2. Completed 3D SketchUp model of student designed project, evaluated by rubric 3. Material sourcing, preparation, cut and assembly of a multi-step build project designed by the student, evaluated by rubric    1. Students design a unique and functional project plan in SketchUp based on skill and interest.    2. Cut and assembly are completed according to plan specifications.    3. Product is evaluated based on proper use of materials and tools with emphasis on safety, skill development, and quality craftsmanship. | | | | |
| **Leadership Alignment**: [Washington CTE 21st Century Leadership Skills](https://www.k12.wa.us/sites/default/files/public/careerteched/pubdocs/washingtoncteleadershipskills.pdf) 7.B.1 Incorporate feedback effectively  7.B.2 Deal positively with praise, setbacks and criticism  7.B.3 Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments  8.A.3 Utilize time and manage workload efficiently  8.B.1 Monitor, define, prioritize and complete tasks without direct oversight  8.C.1 Go beyond basic mastery of skills and/or curriculum to explore and expand one’s own learning and opportunities to gain expertise  8.C.2 Demonstrate initiative to advance skill levels towards a professional level  10.A.1 Set and meet goals, even in the face of obstacles and competing pressures  10.A.2 Prioritize, plan and manage work to achieve the intended result  10.B.1 Demonstrate additional attributes associated with producing high quality products including the abilities to:  10.B.1.a Work positively and ethically  10.B.1.b Manage time and projects effectively  10.B.1.c Multi-task  10.B.1.d Participate actively, as well as be reliable and punctual  10.B.1.f Collaborate and cooperate effectively with teams  10.B.1.g Respect and appreciate team diversity  10.B.1.h Be accountable for results  11.A.2 Leverage strengths of others to accomplish a common goal | | | | |
| **Industry Standards and/or Competencies**: [Residential Construction Industry Competency Model](https://www.careeronestop.org/CompetencyModel/competency-models/pyramid-download.aspx?industry=construction-residential) Initiative:  1.4.1 Pursue work with energy, drive, and effort to accomplish tasks  1.4.2 Persist at a task or problem despite interruptions, obstacles, or setbacks  1.4.3 Work independently and perform effectively even with little or no supervision  1.4.4 Demonstrate the ability to change from one task to another  1.4.5 Take initiative to seek out new responsibilities  1.4.6 Establish and maintain challenging, but realistic work goals  Dependability and Reliability:  1.5.1 Arrive at work fit and on time each day  1.5.2 Avoid absenteeism  1.5.3 Work accurately and quickly under pressure  1.5.4 Complete assignments and meet deadlines  Willingness to Learn  1.6.1 Participate in training opportunities  1.6.3 Treat unexpected circumstances as opportunities to learn  1.6.5 Seek out feedback from others to improve job performance  3.2 Following Directions: Receive, understand, and carry out assignments with minimal supervision.  3.3 Planning and Scheduling: Plan, organize, and schedule a project/job to optimize workflow sequence.  3.5.1 Select and Use Tools and Technology  3.5.1.1 Identify the hand and power tools appropriate to the work site and to the trade  3.5.1.2 Select tools, technology, machinery, and equipment appropriate for a given job  3.5.1.3 Demonstrate appropriate use of tools to complete work functions  3.5.1.4 Identify potential hazards related to the use of tools  3.5.1.5 Operate hand or power tools and equipment in  3.7 Craftsmanship: Recognize the responsibilities and personal characteristics of a professional craftsperson.  4.1.2 Blueprints/Drawings/Specifications  4.1.2.1 Draw rough and detailed scale plans for foundations, buildings, and structures based on preliminary concepts, sketches, engineering calculations, specification sheets and other data  4.1.2.2 Recognize elements and symbols of blueprints, drawings, and specifications  4.1.2.3 Interpret dimensions, symbols, types of lines, views, and scales  4.1.2.4 Visualize three-dimensional forms from two-dimensional drawings  4.1.2.5 Locate worksite features included on a construction plan  4.1.2.6 Convert scaled blueprint drawing measurements to full dimensions for a given project  4.2.1 Identification  4.2.1.1 Identify materials necessary to complete tasks in the trade  4.2.1.2 Describe the structure and properties of various materials  4.2.1.3 Evaluate waste of resources/materials  4.2.1.4 Evaluate necessity for additional/alternative resources/materials  4.2.1.5 Differentiate between compatible and incompatible substances | | | | |
| **Aligned Washington State Academic Standards** | | | | |
| **Arts** |  | | | |
| **Educational Technology** |  | | | |
| **Health Education** |  | | | |
| **Physical Education** |  | | | |
| **English Language Arts: Common Core** |  | | | |
| **Mathematics: Common Core** |  | | | |
| **Mathematical Practices** |  | | | |
| Science |  | | | |
| **Science and Engineering Practice** | | **Disciplinary Core Idea** | **Crosscutting Concept** | |
| 2. Developing and using models  5. Using mathematics and computational thinking  6. Designing solutions  8. Obtaining, evaluating, and communicating information | |  | 3. Scale, proportion, and quantity. In considering phenomena, it is critical to recognize what is  relevant at different measures of size, time, and energy and to recognize how changes in scale,  proportion, or quantity affect a system’s structure or performance.  6. Structure and function. The way in which an object or living thing is shaped and its  substructure determines many of its properties and functions.  7. Stability and change. For natural and built systems alike, conditions of stability and  determinants of rates of change or evolution of a system are critical elements of study. | |
| **Social Studies** |  | | | |
| **World Languages** |  | | | |