STATE SKILL STANDARDS
FURNITURE AND CABINETMAKING

Career & Technical Education

Skills for Employment & Lifelong Learning

Prepared by:

Office of Career, Technical and Adult Education
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Introduction

The Department of Education is continuing the development of statewide skill standards for all career and technical education programs. The standards in this document are for Furniture and Cabinetmaking programs and are designed to clearly state what the student should know and be able to do upon completion of an advanced high-school program.

The writing team determined that any statewide skill standards for programs that teach cabinetmaking should be designed to teach entry-level and advanced skills related to the industry. The standards cover the following areas: **Safety; Planning, Design and Print Reading; Tool and Equipment Use; Joinery, Fasteners and Adhesives; Wood Products and Materials; Construction Techniques; Finishing; Installation**. The standards also include the math skills students need to be successful in the industry and safety is incorporated throughout the standards. Lastly, the document includes performance indicators for fundamental employability skills.

These exit-level standards are designed for advanced programs, for students completing the third level of a three- or four-year furniture and cabinetmaking program. Students at the appropriate level of instruction will be expected to demonstrate competence for all performance indicators in the "meets standard" domains for each performance standard. Teachers are encouraged to use them to focus curriculum objectives for entry-level programs, also.

The standards are organized as follows:

Content Standards are general statements that identify major areas of knowledge, understanding, and skills students are expected to learn in key subject and career areas by the end of the program.

Following each Content Standard are a number of **Performance Standards**. Performance Standards identify the more specific components of each content standard and define the expected abilities of students within each content standard.

Each Performance Standard is analyzed into specific **Performance Indicators**. Performance Indicators are very specific criteria statements for determining whether a student exceeds the standard, meets the standard, or whose performance approaches the standard. Performance indicators may also be used as learning outcomes which teachers can identify as they plan their program learning objectives.

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Content Standard 1.0: The student will demonstrate safe work practices and tool/ equipment usage while performing operations in the work environment.

Performance Standard 1.1	The student will demonstrate adherence to general shop and site safety rules including but not limited to those listed in the following performance indicators.
EXCEEDS STANDARD	♦ Design a safety-improvement plan. ♦ Administer simulated basic first aid procedures for treating cuts, burns, and electrical shock. ♦ Obtain first aid/CPR certification. ♦ Obtain OSHA 10 certification.
MEETS STANDARD	1.1.1 Demonstrate proper use of safety apparel at all times, including but not limited to, eye protection, hearing protection, skin protection, head protection, footwear and protection from airborne particulate matter. 1.1.2 Demonstrate the safe handling, storage and disposal of chemicals, materials and adhesives in accordance with local, state, and federal safety and environmental regulations (OSHA, EPA, HazCom, MSDS, etc.) 1.1.3 Demonstrate continuous awareness of potential hazards to self and others. 1.1.4 Demonstrate appropriate construction-related safety procedures. 1.1.5 Inspect extension cords for the presence of a functional ground connection prior to use. 1.1.6 Place and secure ladders when appropriate. 1.1.7 Demonstrate awareness of personnel and activities near the work area. 1.1.8 Report hazards found on the job site to their supervisor/teacher. 1.1.9 Explain basic first aid procedures for treating cuts, burns, and electrical shock. 1.1.10 Demonstrate proper fall-protection practices and use of safety devices at all times.

APPROACHES STANDARD	♦ Identify potential general lab and worksite safety hazards. ♦ Identify basic first aid procedures for treating cuts, burns, and electrical shock. ♦ List the regulatory agencies that govern job-site safety. ♦ List the four (4) basic classifications of fires and the proper use of fire extinguishers. ♦ Identify basic personal protection equipment. ♦ Identify emergency evacuation procedures.

Nevada Academic Standards Correlation:
Science: N.12.A.4

Furniture and Cabinetmaking

Content Standard 1.0: The student will demonstrate safe work practices and tool/equipment usage while performing operations in the work environment.

Performance Standard 1.2	The students will maintain and use hand and power tools to safely achieve industry-accepted results.
EXCEEDS STANDARD	♦ Perform advanced maintenance on hand and power tools. ♦ Earn certification for specialized equipment.
MEETS STANDARD	1.2.1 Demonstrate the safe use and care of hand tools. 1.2.2 Demonstrate the proper operation of stationary power tools for an assigned task. 1.2.3 Demonstrate the proper operation of stationary power tools for an assigned task. 1.2.4 Perform basic maintenance on hand and power tools. 1.2.5 Demonstrate the proper operation of pneumatic tools. 1.2.6 Inspect power tools for intact guards, shields, insulation and other protective devices.
APPROACHES STANDARD	♦ Identify hand and power tools based on the name and intended use.

Nevada Academic Standards Correlation:
Science: N.12.A.4

Furniture and Cabinetmaking

Content Standard 2.0: The student will demonstrate competency in mathematics.

Performance Standard 2.1	**The student will apply mathematics for practical use in furniture and cabinetmaking.**
EXCEEDS STANDARD	♦ Estimate labor for all aspects of furniture and cabinetmaking construction using industry tables. ♦ Lay out corners using the Pythagorean theorem (3-4-5 Rule) or (6-8-10 Rule). ♦ Use construction calculator to solve project-related problems.
MEETS STANDARD	2.1.1 Check corner layouts using the diagonal method. 2.1.2 Estimate board, square and linear feet using formulas and/or tables with a calculator. 2.1.3 Estimate material costs.
APPROACHES STANDARD	♦ Add, subtract, multiply, and divide whole numbers. ♦ Measure to the nearest 1/32 inch. ♦ Measure to the nearest millimeter. ♦ Add, subtract, multiply and divide fractions, decimals and whole numbers. ♦ Convert fractions to decimals. ♦ Calculate percentages and ratios.

Nevada Academic Standards Correlation:
Math: 1.12.1, 4.12.7, 3.12.4

Furniture and Cabinetmaking

Content Standard 3.0: Students will demonstrate competence in planning, design and blueprint reading in furniture and cabinetmaking.

Performance Standard 3.1	The student will demonstrate an understanding of the elements and principles of design.
EXCEEDS STANDARD	♦ Identify and describe Americans with Disabilities Act (ADA) requirements.
MEETS STANDARD	3.1.1 Identify needs and wants in cabinets and furniture in everyday living. 3.1.2 Identify common sizes in relation to furniture and cabinets. 3.1.3 Apply design elements: shapes, textures, lines and colors to create functional and attractive furniture and cabinets. 3.1.4 Apply principles of design, harmony, repetitions, balance and proportion. 3.1.5 Describe the relationship between the function and form of a cabinet or piece of furniture. 3.1.6 Identify the elements of kitchen floor plans.
APPROACHES STANDARD	♦ Discuss the importance of function and form for furniture and cabinetmaking. ♦ Identify alternative designs with convenience and flexibility. ♦ Explain the decision-making process for furniture and cabinetmaking. ♦ Identify the three levels of design: copying, adapting, and creating.

Nevada Academic Standards Correlation:
Math: 3.12.5, 4.12.1, 4.12.8

Furniture and Cabinetmaking

Content Standard 3.0: Students will demonstrate competence in planning, design and blueprint reading in furniture and cabinetmaking.

Performance Standard 3.2	**The student will identify the various kitchen, furniture and cabinet styles used in the furniture/cabinet industry.**
EXCEEDS STANDARD	♦ Research and design period furniture.
MEETS STANDARD	3.2.1 Explain the progress of cabinetry and furniture styles from the 17th century to today. 3.2.2 Identify various cabinet styles and components. 3.2.3 List characteristics of the styles that belong to traditional, provincial, and contemporary designs. 3.2.4 Identify various kitchen cabinet components.
APPROACHES STANDARD	♦ Identify various forms of cabinet and furniture styles. ♦ Describe the ergonomics/human factors that affect furniture and cabinet design.

Nevada Academic Standards Correlation:
English: 9.12.1

Furniture and Cabinetmaking

Content Standard 3.0: Students will demonstrate competence in planning, design and blueprint reading in furniture and cabinetmaking.

Performance Standard 3.3	The student will demonstrate competence in various drafting techniques and blueprint reading used in industry.
EXCEEDS STANDARD	♦ Use computer software to design furniture/cabinetry. ♦ Create a kitchen cabinet layout.
MEETS STANDARD	3.3.1 Sketch a project using manual drawing techniques. 3.3.2 Use drafting tools to create a pictorial and working drawing. 3.3.3 Create cutting diagrams. 3.3.4 Read and interpret blueprints.
APPROACHES STANDARD	♦ Identify drafting tools and their uses.

Nevada Academic Standards Correlation:
Math: 1.12.1, 3.12.2, 3.12.3, 4.12.1, 4.12.6, 4.12.8
Science: N.12.A.5
English: 4.12.6

Furniture and Cabinetmaking

Content Standard 3.0: Students will demonstrate competence in planning, design and blueprint reading in furniture and cabinetmaking.

Performance Standard 3.4	**The student will interpret and apply information to develop or evaluate a bill of materials.**
EXCEEDS STANDARD	♦ Develop a bill of materials using a computer-based program.
MEETS STANDARD	3.4.1 Develop a bill of materials list from a working drawing. 3.4.2 Develop a cutting list from a working drawing. 3.4.3 Evaluate an existing bill of materials for accuracy.
APPROACHES STANDARD	♦ Read a bill of materials from an existing plan. ♦ Interpret standard industry abbreviations (i.e., S2S, RW&L, KD, 6/4).

Nevada Academic Standards Correlation:
Math: 1.12.1, 3.12.2, 3.12.3, 3.12.5

Furniture and Cabinetmaking

Content Standard 3.0: Students will demonstrate competence in planning, design and blueprint reading in furniture and cabinetmaking.

Performance Standard 3.5	**The student will estimate the quantity and cost of materials.**
EXCEEDS STANDARD	♦ Develop a total cost estimate for kitchen cabinetry in a residence.
MEETS STANDARD	3.5.1 Determine the cost of materials needed for a furniture/cabinetmaking project. 3.5.2 Optimize available materials from a cutting diagram. 3.5.3 Compare and contrast the cost of a specific project using different materials.
APPROACHES STANDARD	♦ Compare board feet, square feet, and linear feet. ♦ Read and interpret a price list. ♦ Demonstrate the ability to locate a building material supplier.

Nevada Academic Standards Correlation:
Math: 3.12.4, 1.12.1, 3.12.3, 3.12.2

Furniture and Cabinetmaking

Content Standard 3.0: Students will demonstrate competence in planning, design and blueprint reading in furniture and cabinetmaking.

Performance Standard 3.6	**The student will develop a plan of procedures necessary to complete a project.**
EXCEEDS STANDARD	♦ Develop a plan of procedures for a complete kitchen.
MEETS STANDARD	3.6.1 List the sequence of cutting. 3.6.2 List the sequence of assembly. 3.6.3 List the sequence of finishing steps.
APPROACHES STANDARD	♦ List the steps to square a board. ♦ Explain the elements and importance of a plan of procedures.

Furniture and Cabinetmaking

Content Standard 4.0: The student will demonstrate proper tool selection and usage in the work environment.

Performance Standard 4.1	**The student will demonstrate the proper use of measuring and layout tools.**
EXCEEDS STANDARD	♦ Demonstrate how to use digital and electronic measurement and layout tools. ♦ Demonstrate and use mechanical precision measuring equipment to the nearest .001 inch.
MEETS STANDARD	4.1.1 Demonstrate the accurate use of common measuring and layout tools. 4.1.2 Select the proper layout tools for specific tasks.
APPROACHES STANDARD	♦ Read a ruler and measure to the nearest 1/32 inch. ♦ Read a ruler and measure to the nearest millimeter. ♦ Identify commonly used measuring and layout tools (i.e., measuring tools, squares, gauges, dividers, calipers) ♦ Identify common layout and measurement terms (i.e., squareness, concentricity, perpendicular, parallel)

Nevada Academic Standards Correlation:
Math: 3.12.2, 3.12.3

Furniture and Cabinetmaking

Content Standard 4.0: The student will demonstrate proper tool selection and usage in the work environment.

Performance Standard 4.2	**The student will demonstrate the proper use of cutting tools.**
EXCEEDS STANDARD	♦ Maintain and sharpen cutting hand tools. ♦ Hand-cut a dovetail.
MEETS STANDARD	4.2.1 Select the proper cutting tools for specific operations. 4.2.2 Demonstrate the safe and proper use of specific hand-cutting tools. 4.2.3 Select tools for cutting curves and straight cuts. 4.2.4 Select the most appropriate blade for a given operation.
APPROACHES STANDARD	♦ Identify the various types and kinds of cutting tools, (i.e., hacksaw, backsaw, compass saw, coping saw, dovetail saw, keyhole saw, crosscut saw, ripsaw, cabinet scraper). ♦ Identify terms used with cutting tools (i.e., kerf, set, grain and TPI).

Furniture and Cabinetmaking

Content Standard 4.0: The student will demonstrate proper tool selection and usage in the work environment.

Performance Standard 4.3	**The student will demonstrate the proper use of striking tools.**
EXCEEDS STANDARD	♦ Use specific striking tools to create mortise and tenon joints.
MEETS STANDARD	4.3.1 Demonstrate the safe and proper use of specific striking tools. 4.3.2 Maintain striking tools (i.e., dressing, sharpening, grinding).
APPROACHES STANDARD	♦ Identify various types of striking tools, (i.e., hammers, mallets, nail sets, chisels, punches).

Furniture and Cabinetmaking

Content Standard 4.0: The student will demonstrate proper tool selection and usage in the work environment.

Performance Standard 4.4	**The student will demonstrate the proper use of hand boring tools.**
EXCEEDS STANDARD	♦ Students will hand bore using a doweling jig.
MEETS STANDARD	4.4.1 Select the proper boring tools for specific operations. 4.4.2 Demonstrate the safe and proper use of hand boring tools.
APPROACHES STANDARD	♦ Identify various types of shaping and boring tools and their uses (i.e., auger bit, Forstner bit, masonry drill bit, multi-spur bit, plug cutter, spade bit, twist drill bit, single taper twist bit and countersink bit). ♦ Identify common terms (i.e., drilling, boring, counter boring and countersinking).

Furniture and Cabinetmaking

Content Standard 4.0: The student will demonstrate proper tool selection and usage in the work environment.

Performance Standard 4.5	**The student will demonstrate the proper use of hand-shaping tools.**
EXCEEDS STANDARD	♦ Carve an identifiable object using hand-shaping tools. ♦ Square a board using hand-shaping tools.
MEETS STANDARD	4.5.1 Select the proper hand-shaping tools for specific operations. 4.5.2 Demonstrate the safe and proper use of hand-shaping tools. 4.5.3 Construct a working edge. 4.5.4 Construct a working surface.
APPROACHES STANDARD	♦ Identify various types of hand shaping tools and their uses (i.e., draw knife, planes, spokeshave, rasps, files, carving tools, chisel and surform). ♦ Identify terms used with hand-shaping tools (i.e., concave, convex, radius, bevel, taper and profile).

Furniture and Cabinetmaking

Content Standard 4.0: The student will demonstrate proper tool selection and usage in the work environment.

Performance Standard 4.6	**The student will demonstrate the proper use of clamping tools.**
EXCEEDS STANDARD	♦ Form curved shapes using vacuum bag clamping.
MEETS STANDARD	4.6.1 Select proper clamping tools for specific operations. 4.6.2 Demonstrate safe and proper use of clamping tools. 4.6.3 Demonstrate initial assembly and dry clamping procedures.
APPROACHES STANDARD	♦ Identify various clamping tools (i.e., c-clamp, bar clamp, bench vise, band clamp, face frame clamp, web clamp, vacuum bag, hand-screw clamp, spring clamp).

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Content Standard 5.0: The student will demonstrate proper power tool usage in the working environment.

Performance Standard 5.1	**The student will demonstrate the proper and safe use of portable power tools.**
EXCEEDS STANDARD	♦ Perform advanced maintenance on portable power tools. ♦ Obtain the OSHA CareerSafe certification.
MEETS STANDARD	5.1.1 Demonstrate the operation of portable power tools for an assigned task. 5.1.2 Perform basic maintenance on a portable power tool. 5.1.3 Pass a written safety test on the use of portable power tools. 5.1.4 Demonstrate a performance skills safety test. 5.1.5 Demonstrate the safe use of pneumatic power tools.
APPROACHES STANDARD	♦ Identify common portable power tools (i.e., saws, drills, sanders, routers, nailers and plate joiners).

Furniture and Cabinetmaking

Content Standard 5.0: The student will demonstrate proper power tool usage in the working environment.

Performance Standard 5.2	**The student will demonstrate the proper and safe use of stationary power tools.**
EXCEEDS STANDARD	♦ Perform advanced maintenance on stationary power tools. ♦ Obtain the OSHA CareerSafe certification.
MEETS STANDARD	5.2.1 Pass written safety tests on the use of stationary power tools. 5.2.2 Pass performance-based skills safety tests. 5.2.3 Perform basic and special set-up operations on stationary power tools. 5.2.4 Demonstrate the proper operation of stationary power tools for an assigned task. 5.2.5 Perform basic maintenance and care of stationary power tools.
APPROACHES STANDARD	♦ Identify common stationary power tools, (i.e., saw, jointer, planer, sander, lathe, drill press, shaper).

Furniture and Cabinetmaking

Content Standard 6.0: The student will demonstrate a working knowledge of joinery, fasteners and adhesives.

Performance Standard 6.1	**The student will demonstrate a working knowledge of the various metallic fasteners and their uses in the furniture and cabinetmaking industry.**
EXCEEDS STANDARD	♦ Design a project requiring the use of specialized metallic fasteners.
MEETS STANDARD	6.1.1 Define the purposes for metallic fasteners in furniture and cabinetmaking. 6.1.2 Select the proper metallic fasteners for specific applications. 6.1.3 Demonstrate the proper use of metallic fasteners for specific applications.
APPROACHES STANDARD	♦ Identify the various metallic fasteners and nomenclature used in the furniture and cabinetmaking industry (i.e., screws, nails, bolts, staples and anchors). ♦ Identify general techniques (i.e., toe nailing, countersinking and pocket screws).

Furniture and Cabinetmaking

Content Standard 6.0: The student will demonstrate a working knowledge of joinery, fasteners and adhesives.

Performance Standard 6.2	**The student will identify and use various dowels and biscuits in the furniture and cabinetmaking industry.**
EXCEEDS STANDARD	♦ Design a project using both dowels and biscuits. ♦ Conduct a strength test comparing dowel and biscuit joinery.
MEETS STANDARD	6.2.1 Determine appropriate applications and sizes for dowels and biscuits. 6.2.2 Construct a dowel joint. 6.2.3 Construct a biscuit joint.
APPROACHES STANDARD	♦ Identify the various types and sizes of biscuits and dowels used. ♦ Identify the advantages and disadvantages of dowel and biscuit joinery.

Furniture and Cabinetmaking

Content Standard 6.0: The student will demonstrate a working knowledge of joinery, fasteners and adhesives.

Performance Standard 6.3	**The student will identify the various adhesives and their uses in the furniture and cabinetmaking industry.**
EXCEEDS STANDARD	♦ Develop a research paper describing the uses of adhesives in industrial processes.
MEETS STANDARD	6.3.1 Select the proper adhesive(s) to construct wood joints used in furniture or cabinets. 6.3.2 Demonstrate the proper use and application of adhesives. 6.3.3 Demonstrate the proper cleanup procedures for specific adhesives. 6.3.4 Identify characteristics of adhesives that affect the assembly time, cure time and strength of the product.
APPROACHES STANDARD	♦ Describe the types of adhesives used in the furniture and cabinetmaking industry, (i.e., aliphatic resins, Polyvinyl, contact cement, urethane, epoxy and thermal setting). ♦ List and define common terminology to include: open assembly time; closed assembly time; cure time; slip and shelf life.

Nevada Academic Standards Correlation:
Science: P.12.A.5

Furniture and Cabinetmaking

Content Standard 6.0: The student will demonstrate a working knowledge of joinery, fasteners and adhesives.

Performance Standard 6.4	**The student will identify and construct various wood joints used in the furniture and cabinetmaking industry.**
EXCEEDS STANDARD	♦ Design and conduct a test to measure the strengths and weaknesses of various wood joints. ♦ Design and construct jigs and fixtures for specialty applications.
MEETS STANDARD	6.4.1 Construct five (5) separate types of wood joints. 6.4.2 Compare and contrast joints commonly used in the cabinet and furniture making industries, (i.e., strength, appearance and ease of construction). 6.4.3 Select the correct type of wood joint used for a specific application and material. 6.4.4 Demonstrate the proper use of tools used in creating and applying specific wood joints.
APPROACHES STANDARD	♦ Identify the types of wood joints, (i.e., butt, edge, rabbit, dado, miter, mortise and tenon, lap and dovetail).

Furniture and Cabinetmaking

Content Standard 7.0: The student will identify wood products and materials used in the furniture and cabinetmaking industry and describe their characteristics and uses.

Performance Standard 7.1	**The student will identify hardwoods and softwoods.**
EXCEEDS STANDARD	♦ Research and present information identifying the current status of a specific species of lumber found in the furniture and cabinetmaking industries.
MEETS STANDARD	7.1.1 Define the difference between a hardwood and a softwood. 7.1.2 Identify a minimum of five (5) species of hardwood and its characteristics that are common to the furniture and cabinet industry. 7.1.3 Identify a minimum of five (5) species of softwood and its characteristics that are common to the furniture and cabinet industry. 7.1.4 Identify common defects found in wood and list possible solutions.
APPROACHES STANDARD	♦ Identify characteristics of wood (i.e., open grain, close grain, texture, smell and color). ♦ Identify common terms, (i.e., moisture content, air dry, kiln dry, lumber grades and lumber surfacing). ♦ Identify price considerations of various hardwoods and softwoods.

Nevada Academic Standards Correlation:
Science: L.12.B.1
English: 9.12.1

Furniture and Cabinetmaking

Content Standard 7.0: The student will identify wood products and materials used in the furniture and cabinetmaking industry and describe their characteristics and uses.

Performance Standard 7.2	**The student will identify various sheet goods and describe their characteristics and uses.**
EXCEEDS STANDARD	♦ Research and present information on the sources of raw materials for sheet good products. ♦ Research and present information on the manufacturing process of sheet good products.
MEETS STANDARD	7.2.1 Identify a minimum of five (5) types of panel products used in the furniture and cabinetmaking industries. 7.2.2 Explain the use of various panel products and their uses in the furniture and cabinetmaking industries. 7.2.3 Describe the cutting and handling techniques used for sheet goods. 7.2.4 Compare and contrast the advantages and disadvantages of sheet goods versus solid wood stock.
APPROACHES STANDARD	♦ Identify various types of sheet goods (i.e., plywood, melamine, particle board, fiber board and hardboard). ♦ Identify the various grading designations (i.e., good one side, shop, density, interior and exterior). ♦ Identify the common sizes of sheet materials. ♦ Identify price considerations of various sheet goods.

Furniture and Cabinetmaking

Content Standard 7.0: The student will identify wood products and materials used in the furniture and cabinetmaking industry and describe their characteristics and uses.

Performance Standard 7.3	**The student will be able to identify and describe the characteristic and uses of various solid surfaces and laminate materials.**
EXCEEDS STANDARD	♦ Research and present information on how laminate is manufactured. ♦ Student will develop a method for repairing delaminations. ♦ Research and present information on various solid surfaces used in the furniture and cabinetmaking industry.
MEETS STANDARD	7.3.1 Identify standard sizes of laminates. 7.3.2 Identify the grades of various laminates. 7.3.3 Identify substrates required for laminating. 7.3.4 Identify the proper adhesive required for applying laminate.
APPROACHES STANDARD	♦ Identify the different edge treatments for laminating. ♦ Identify common terms (i.e., postform, substrate and self-edge). ♦ List the advantages of using laminates. ♦ List the limitations of laminates.

Nevada Academic Standards Correlation:
Science: P.12.A.5

Furniture and Cabinetmaking

Content Standard 7.0: The student will identify wood products and materials used in the furniture and cabinetmaking industry and describe their characteristics and uses.

Performance Standard 7.4	**The student will identify various veneers and describe their characteristics and uses.**
EXCEEDS STANDARD	♦ Research and present information on how veneers are manufactured. ♦ Demonstrate a method for repairing damaged veneers.
MEETS STANDARD	7.4.1 Identify standard sizes of veneers. 7.4.2 Identify the grades of various veneers. 7.4.3 Identify substrates required for veneers. 7.4.4 Identify the proper adhesive(s) required for applying veneers. 7.4.5 Identify the types of pattern matching in veneers.
APPROACHES STANDARD	♦ Identify the different edge treatments for veneers. ♦ Identify common terms (i.e., vacuum press, marquetry, parquetry, inlay and pattern matching). ♦ List the advantages of using veneers. ♦ List the limitations of veneers.

Nevada Academic Standards Correlation:
Science: P.12.A.5

Furniture and Cabinetmaking

Content Standard 8.0: The student will demonstrate competence in various construction processes in the furniture and cabinetmaking industry.

Performance Standard 8.1	**The student will demonstrate furniture construction techniques.**
EXCEEDS STANDARD	♦ Construct a cabriole leg. ♦ Hand carve a custom furniture part (i.e., ball and claw foot, appliqué, etc.). ♦ Demonstrate bending and laminating of material to a contoured shape.
MEETS STANDARD	8.1.1 Square a board to a specific size. 8.1.2 Demonstrate common case construction. 8.1.3 Demonstrate common frame and panel construction. 8.1.4 Demonstrate common leg and rail construction.
APPROACHES STANDARD	♦ Identify common furniture construction terms (i.e., stile, rail, grain pattern, mullion).

Nevada Academic Standards Correlation:
Math: 3.12.2

Furniture and Cabinetmaking

Content Standard 8.0: The student will demonstrate competence in various construction processes in the furniture and cabinetmaking industry.

Performance Standard 8.2	**The student will demonstrate cabinet construction techniques.**
EXCEEDS STANDARD	♦ Construct a dovetail drawer. ♦ Construct a multiple cabinet layout.
MEETS STANDARD	8.2.1 Square a board to a specific size. 8.2.2 Construct a 32 millimeter case using appropriate construction techniques. 8.2.3 Construct a case with a face frame using appropriate construction techniques. 8.2.4 Construct a frameless case using appropriate construction techniques. 8.2.5 Construct a cabinet drawer using appropriate construction techniques. 8.2.6 Construct a cabinet door using appropriate construction techniques.
APPROACHES STANDARD	♦ Identify common terms used in cabinet construction (i.e., grain direction, web frame, stiles and rails, joints and doors). ♦ Identify common door styles and construction techniques. ♦ Identify common drawer styles and construction techniques. ♦ Identify what type of case construction is appropriate for a specific project.

Nevada Academic Standards Correlation:
Math: 3.12.2

Furniture and Cabinetmaking

Content Standard 8.0: The student will demonstrate competence in various construction processes in the furniture and cabinetmaking industry.

Performance Standard 8.3	**The student will understand and use manufacturing and mass production techniques.**
EXCEEDS STANDARD	♦ Develop a procedure to mass produce a product. ♦ Prepare a research paper on a manufacturing process that influences the furniture and cabinetmaking construction industry. ♦ Develop a flow chart and production schedule to mass produce a product. ♦ Research and present information on current trends in manufacturing and mass production. ♦ Develop a CNC produced part.
MEETS STANDARD	8.3.1 Demonstrate the use of a jig, template or fixture in a mass production project. 8.3.2 Use a specific quality control instrument to check the accuracy of a project. 8.3.3 Demonstrate the use of a mass production technique (i.e., parts duplication and assembly processes).
APPROACHES STANDARD	♦ Identify common terms (i.e., jigs and fixtures, quality assurance, quality control, CNC, templates, mass production, flow chart and critical path). ♦ Identify the advantages and disadvantages of mass production cabinets versus custom-built cabinets. ♦ Identify mass production processes used in the furniture and cabinetmaking industry.

Nevada Academic Standards Correlation:
Math: 3.12.3

Furniture and Cabinetmaking

Content Standard 8.0: The student will demonstrate competence in various construction processes in the furniture and cabinetmaking industry.

Performance Standard 8.4	**The student will select and install various hardware used in the furniture and cabinetmaking industry.**
EXCEEDS STANDARD	♦ Design and construct hardware for a specific project. ♦ Create a hardware schedule for a multiple cabinet installation. ♦ Layout and install decorative hardware on a project. ♦ Develop a hardware installation template.
MEETS STANDARD	8.4.1 Select the appropriate hardware for a specific project. 8.4.2 Create a hardware schedule for a specific project. 8.4.3 Layout, install and adjust the appropriate drawer hardware to include drawer slides and pulls. 8.4.4 Layout, install and adjust the appropriate door hardware to include European and standard hinges.
APPROACHES STANDARD	♦ Identify common terms (i.e., hinge, knobs, pulls, slide, European, caster, latch and locks). ♦ Identify common types of hardware (i.e., drawer hardware, door hardware, bottom and side mounts and case mounts).

Nevada Academic Standards Correlation:
Math: 3.12.2

Furniture and Cabinetmaking

Content Standard 8.0: The student will demonstrate competence in various construction processes in the furniture and cabinetmaking industry.

Performance Standard 8.5	**The student will demonstrate various plastic laminating techniques.**
EXCEEDS STANDARD	♦ Bend a laminate to match a contoured surface. ♦ Prepare a research paper describing how plastic laminate is manufactured. ♦ Research and present information about a solid surface material such as Corian. ♦ Demonstrate how to repair a delamination in plastic laminate.
MEETS STANDARD	8.5.1 Prepare a substrate for bonding a laminate to a surface. 8.5.2 Cut plastic laminates. 8.5.3 Apply a plastic laminate to a surface using an appropriate adhesive. 8.5.4 Trim laminate using a router and laminate file. 8.5.5 Apply a minimum of three (3) different edge treatments. 8.5.6 Use appropriate tools for shaping laminates.
APPROACHES STANDARD	♦ Identify various plastic laminates used in the furniture and cabinetmaking industry. ♦ Identify a minimum of three (3) different edge treatments. ♦ Identify appropriate tools for shaping laminates.

Nevada Academic Standards Correlation:
Science: P.12.A.5

Furniture and Cabinetmaking

Content Standard 9.0: The student will prepare a project and apply finishes to industry standards.

Performance Standard 9.1	**The student will use various abrasives to prepare a project for a finish.**
EXCEEDS STANDARD	♦ Prepare a research paper on the manufacturing processes for abrasives.
MEETS STANDARD	9.1.1 Properly prepare a surface for treatment. 9.1.2 Select the proper abrasive for shaping and smoothing materials. 9.1.3 Select the proper grit sizes and sequences for shaping and smoothing operations. 9.1.4 Demonstrate the proper ways to keep abrasives clean. 9.1.5 Comply with the health and safety factors used in working with abrasives.
APPROACHES STANDARD	♦ Identify the various types of natural and synthetic abrasives. ♦ Identify the different grading systems for abrasives (i.e., steel wool, grit system, paste abrasives, backing and adhesives). ♦ Identify common terms (i.e., open coat, close coat, and non-loading). ♦ Identify different forms/shapes of abrasives (i.e., disc, belts, sheets, strips and drums).

Furniture and Cabinetmaking

Content Standard 9.0: The student will prepare a project and apply finishes to industry standards.

Performance Standard 9.2	**The student will select and apply various stains used in the cabinetmaking and furniture industries.**
EXCEEDS STANDARD	♦ Mixing different colors of stains to match an existing color. ♦ Spray stain.
MEETS STANDARD	9.2.1 Select the proper type of stain for a specific application. 9.2.2 Demonstrate proper application methods for different types of stains. 9.2.3 Comply with the health and safety factors used in working with stains. 9.2.4 Demonstrate cleaning procedure for various types of stains.
APPROACHES STANDARD	♦ Describe the various ways of applying stains. ♦ Describe the proper ways to prepare a surface before applying stains. ♦ Identify the various types of stains. ♦ Identify common terms (i.e., vehicle, pigment, bleeding and coverage).

Nevada Academic Standards Correlation:
Science: P.12.A.6

Furniture and Cabinetmaking

Content Standard 9.0: The student will prepare a project and apply finishes to industry standards.

Performance Standard 9.3	**The student will identify and apply various sealers and finish coats used in the cabinetmaking and furniture industry.**
EXCEEDS STANDARD	♦ Apply a two-part epoxy-finishing coat. ♦ Prepare a research paper comparing and contrasting different types of finish coats. ♦ Apply a French polish finish.
MEETS STANDARD	9.3.1 Demonstrate proper application methods for different types of sealers and finish coats. 9.3.2 Select the proper type of sealer and finish coat for a specific application. 9.3.3 Comply with the health and safety factors used in working with sealer and finish coats (i.e., spray booths, respirators, gloves and spray equipment). 9.3.4 Demonstrate cleaning procedures for various types of sealer and finish coats.
APPROACHES STANDARD	♦ Describe the various ways of applying sealer and finish coats. ♦ Describe the proper ways to prepare a surface before applying a sealer or finish coat. ♦ Identify the various types of sealer and finish coats. ♦ Identify common terms (i.e., gloss, sheen, sealer and topcoat).

Nevada Academic Standards Correlation:
Science: P.12.A.5, P.12.A.6

Furniture and Cabinetmaking

Content Standard 9.0: The student will prepare a project and apply finishes to industry standards.

Performance Standard 9.4	**The student will identify and apply various fillers found in the cabinetmaking and furniture industries.**
EXCEEDS STANDARD	♦ Create a filler material for use in an application.
MEETS STANDARD	9.4.1 Demonstrate proper application methods for different types of filler materials. 9.4.2 Select the proper type of filler material for a specific application. 9.4.3 Comply with the health and safety factors used in working with filler materials. 9.4.4 Demonstrate cleaning procedures for various types of filler materials.
APPROACHES STANDARD	♦ Describe the various ways of applying filler materials. ♦ Describe the proper ways to prepare a surface before applying a filler material. ♦ Identify the various types of filler materials. ♦ Identify common terms (i.e., putty, shellac, plastic wood and water-based filler).

Nevada Academic Standards Correlation:
Science: P12.A.5, P.12.A.6

Furniture and Cabinetmaking

Content Standard 10.0: The student will transport and install furniture and cabinets according to industry standards.

Performance Standard 10.1	**The student will demonstrate proper techniques for packaging and transporting furniture and cabinets.**
EXCEEDS STANDARD	♦ Create a specialized crate to properly ship a project.
MEETS STANDARD	10.1.1 Package a project for shipping. 10.1.2 Secure a packaged project for transportation. 10.1.3 Transport a project from one location to another without damage.
APPROACHES STANDARD	♦ Identify proper lifting techniques. ♦ Identify proper packaging materials. ♦ Identify precautions to be used when transporting projects.

Furniture and Cabinetmaking

Content Standard 10.0: The student will transport and install furniture and cabinets according to industry standards.

Performance Standard 10.2	**The student will demonstrate the proper layout and installation of cabinets.**
EXCEEDS STANDARD	♦ Layout and install a complete set of kitchen cabinets at a job site. ♦ Install a bathroom vanity cabinet.
MEETS STANDARD	10.2.1 Layout a cabinet installation according to a floor plan. 10.2.2 Layout a plumb line and a level line. 10.2.3 Adjust a layout to plumb, square and level. 10.2.4 Install a base cabinet. 10.2.5 Install an upper cabinet.
APPROACHES STANDARD	♦ Identify common cabinet installation terms (i.e., plumb, level, square, base cabinet, upper cabinet and tall cabinet).

Nevada Academic Standards Correlation:
Math: 1.12.1, 3.12.2, 4.12.7

Furniture and Cabinetmaking

Content Standard 10.0: The student will transport and install furniture and cabinets according to industry standards.

Performance Standard 10.3	**The student will demonstrate the proper layout, fabrication, and installation of countertops.**
EXCEEDS STANDARD	♦ Design and fabricate a substrate for a countertop installation. ♦ Scribe into two (2) adjacent corners. ♦ Install cut-ins (i.e., breadboard, sink, cook top)
MEETS STANDARD	10.3.1 Create and adjust a layout to plumb, square and level. 10.3.2 Scribe into a corner. 10.3.3 Use appropriate fastening methods for attaching countertops to cabinets. 10.3.4 Use a cut-in template.
APPROACHES STANDARD	♦ Define the terms: scribe, plumb, square and level. ♦ Identify hardware specific to countertops (i.e., draw bolts, sink clips).

Nevada Academic Standards Correlation:
Math: 3.12.2, 4.12.7

Furniture and Cabinetmaking

Content Standard 10.0: The student will transport and install furniture and cabinets according to industry standards.

Performance Standard 10.4	**The student will demonstrate the proper layout, and installation of molding and trim.**
EXCEEDS STANDARD	♦ Design a custom molding and/or trim. ♦ Create a custom molding and/or trim for a specific project.
MEETS STANDARD	10.4.1 Layout and cut molding and/or trim to the appropriate angle and size for a specific application. 10.4.2 Use the appropriate adhesives and fasteners to install a minimum of three (3) different types of trim and/or molding. 10.4.3 Demonstrate the proper techniques to construct a miter (other than 90 degrees), a compound miter and a cope.
APPROACHES STANDARD	♦ Identify different types of molding and trim. ♦ Identify the appropriate tools, adhesives and fasteners used for the installation of moldings and trims. ♦ Identify the specific joints specific to molding and/or trim (i.e., coped, miter, compound miter and outside miter)

Nevada Academic Standards Correlation:
Math: 1.12.1, 3.12.2, 4.12.6, 4.12.7
Science: P.12.A.5

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.1	**The student will demonstrate problem-solving skills.**
EXCEEDS STANDARD	♦ Develop methods to analyze the advantages and disadvantages of alternative solutions. ♦ Devise an action plan for a furniture and cabinetmaking problem based on information gained through research of alternative solutions and implement in a group decision/action.
MEETS STANDARD	11.1.1 Solve a furniture and cabinetmaking problem using the appropriate steps in the problem-solving process. 11.1.2 Demonstrate brainstorming techniques. 11.1.3 Examine and explain the advantages and disadvantages of alternative solutions to one or more problems. 11.1.4 Create an action plan based upon a solution to a furniture and cabinetmaking problem. 11.1.5 Identify the benefits of solving a furniture and cabinetmaking problem.
APPROACHES STANDARD	♦ Identify the basic steps in the problem-solving process. ♦ Identify alternative solutions to a problem. ♦ Identify the basic components of an action plan.

Nevada Academic Standards Correlation:
English: 10.12.2, 10.12.3

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.2	**The student will demonstrate critical-thinking skills.**
EXCEEDS STANDARD	♦ Analyze how critical-thinking skills affect work performance. ♦ Formulate, implement, and evaluate an action plan. ♦ Demonstrate the skills necessary to identify, analyze, and solve a design problem.
MEETS STANDARD	11.2.1 Identify and explain the essential elements of the critical-thinking process as related to the furniture and cabinetmaking trades. 11.2.2 Demonstrate critical-thinking skills necessary in the furniture and cabinetmaking trades. 11.2.3 Explain how emotional thinking and logical thinking affect decision making in the furniture and cabinetmaking trades. 11.2.4 Explain the difference between reliable and unreliable observations and statements of facts. 11.2.5 Recognize patterns or relationships through observation and discovery.
APPROACHES STANDARD	♦ State the importance of critical thinking in identifying, analyzing, and solving a furniture and cabinetmaking problem. ♦ Identify the essential steps of critical thinking. ♦ Define emotional and logical thinking. ♦ Identify the difference between opinions and statements of fact.

Nevada Academic Standards Correlation:
English: 10.12.1

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.3	**The student will demonstrate the ability to speak, write and listen effectively.**
EXCEEDS STANDARD	♦ Research and present information on a topic related to furniture and cabinetmaking. ♦ Prepare technical documents relating to bill of materials, blueprints, plan of procedures, etc. ♦ Present and defend a furniture and cabinetmaking procedure. ♦ Compete in a SkillsUSA job skill demonstration and/or public speaking contest.
MEETS STANDARD	11.3.1 Explain the benefits of effective communication skills in the workplace. 11.3.2 Effectively interpret and respond to verbal and nonverbal messages. 11.3.3 Demonstrate proper telephone etiquette. 11.3.4 Effectively communicate thoughts, ideas and information in writing. 11.3.5 Organize ideas and communicate orally; is able to effectively demonstrate job skills to others. 11.3.6 Locate, understand and interpret written information in documents such as manuals, graphs and schedules. 11.3.7 Select and utilize an appropriate medium for conveying messages with dignity and respect. 11.3.8 Organize information into the appropriate format in accordance with standard practices, which includes prewriting, drafting, proofreading, editing/revising, and preparing a final copy. 11.3.9 Demonstrate sensitivity to cultural diversity in communication. 11.3.10 Identify common communication barriers and methods for improving communication.

APPROACHES STANDARD	♦ Define communications. ♦ Explain the benefits of effective communication in the furniture and cabinetmaking trade. ♦ Explain how cultural and physical diversity affect communication. ♦ Identify applicable medium for conveying messages.

Nevada Academic Standards Correlation:
English: 4.12.6, 6.12.5, 7.12.1, 7.12.3, 7.12.4, 7.12.5

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.4	The student will demonstrate the ability to select, apply and maintain appropriate technology.
EXCEEDS STANDARD	♦ Critique the use, benefits and cost of technologically advanced equipment in the furniture and cabinetmaking trades. ♦ Analyze the impact of technological changes on one or more aspects of furniture and cabinetmaking trades by researching current literature. ♦ Compete in a state-level SkillsUSA cabinetmaking contest.
MEETS STANDARD	11.4.1 Demonstrate ability to utilize basic keyboarding techniques. 11.4.2 Demonstrate ability to utilize other input devices. 11.4.3 Demonstrate ability to utilize various electronic research methods. 11.4.4 Demonstrate knowledge of the basic technology systems currently available and how they apply to your field (i.e., word processing, spreadsheets, multimedia applications and databases). 11.4.5 Investigate and explain the use, benefits, and costs of technological developments in the workplace and school. 11.4.6 Identify and demonstrate the appropriate use of technology to enhance the efficiency of the workplace and school. 11.4.7 Demonstrate routine maintenance and repair of technological equipment.
APPROACHES STANDARD	♦ Recognize technology used in the furniture and cabinetmaking trades. ♦ Use an Internet browser to locate specific Websites related to the furniture and cabinetmaking trades.

Nevada Academic Standards Correlation:
Math: 3.12.4

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.5	The student will demonstrate leadership and teamwork skills.
EXCEEDS STANDARD	♦ Analyze the stages of group development. ♦ Demonstrate leadership ability within a group or team. ♦ Compromise and/or build consensus within a group and summarize the decision of the group while maintaining respect for diverse viewpoints. ♦ Complete levels 1-3 of the SkillsUSA Professional Development Program. ♦ Campaign for a local SkillsUSA chapter office. ♦ Serve as a committee chair in a local SkillsUSA chapter.
MEETS STANDARD	11.5.1 Work cooperatively with others when given group project. 11.5.2 Explain traits necessary to effectively lead and influence individuals and groups. 11.5.3 Demonstrate appropriate attitudes and behaviors for effective leadership. 11.5.4 Demonstrate respect for team members, team processes, and team goals. 11.5.5 Participate in the implementation of a group's decision and evaluate the results. 11.5.6 Demonstrate the qualities of an effective leader and team member. 11.5.7 Describe the importance of a proper dress code.
APPROACHES STANDARD	♦ Explain the importance of groups. ♦ Explain how to organize groups. ♦ Wear appropriate attire.

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.6	**The student will demonstrate sound workplace ethics.**
EXCEEDS STANDARD	♦ Demonstrate time-management skills and cost-effective practices.
MEETS STANDARD	11.6.1 Develop personal work ethics through work experience. 11.6.2 Demonstrate correct ethics in the workplace. 11.6.3 Demonstrate regular attendance, promptness, and the willingness to follow instructions and complete an assigned task. 11.6.4 Demonstrate appropriate personal and professional attitudes and behaviors. 11.6.5 Maintain a safe, clean, and organized work area. 11.6.6 Demonstrate awareness of legal responsibilities related to individual performance, safety, and customer satisfaction. 11.6.7 Demonstrate knowledge of various types of harassment.
APPROACHES STANDARD	♦ Describe the importance of ethics in the workplace. ♦ Meet attendance standards. ♦ Describe an organized workplace. ♦ Identify appropriate responses to unethical actions.

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.7	**The student will demonstrate the ability to effectively manage resources in high-performance workplaces.**
EXCEEDS STANDARD	♦ Recognize the individual roles of team members, delegate tasks, and provide feedback on performance. ♦ Acknowledge and utilize the skills, abilities, and input of all members of a team. ♦ Develop an action plan to accomplish tasks within a given period.
MEETS STANDARD	11.7.1 Develop a time schedule and prioritized task list to complete a job assignment. 11.7.2 Identify the resources needed to complete a job assignment. 11.7.3 Organize the material resources and space requirements needed to complete a job assignment. 11.7.4 Effectively use technology to complete a job assignment. 11.7.5 Demonstrate cooperation and leadership as a team at school or in a workplace setting. 11.7.6 Use the basic components of effective time management. 11.7.7 Recognize the need for management skills in the workplace with regard to stress, anger management and substance abuse.
APPROACHES STANDARD	♦ List effective time management skills. ♦ Utilize materials, tools, and processes to complete a task related to a career selection. ♦ Read and follow instructions from manuals on the use and care of materials, tools, and equipment. ♦ Maintain a clean, organized, and safe job site. ♦ Identify traits needed for cooperation and leadership in a team at school or in a workplace setting. ♦ Identify the material resources and space requirements needed to complete an assignment.

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.8	**The student will demonstrate career planning and development skills.**
EXCEEDS STANDARD	♦ Develop a community service or job-shadowing project. ♦ Develop an education/training plan to fulfill long-term career goals. ♦ Define advantages and disadvantages of self-employment or working for various sizes and types of businesses. ♦ Critique the results of a job interview. ♦ Develop a proposal for an organized community service project. ♦ Compete in a state level SkillsUSA job interview contest. ♦ Investigate the opportunities presented by an apprenticeship program.
MEETS STANDARD	11.8.1 Prepare a job application. 11.8.2 Prepare a personal resume. 11.8.3 Complete a personal aptitude and interest inventory. 11.8.4 Participate in a mock job interview. 11.8.5 Establish short-term career goals. 11.8.6 Establish long-term career goals. 11.8.7 Use the Nevada Career Information System (NCIS) or a similar computer-based program to research careers in a chosen field. 11.8.8 Participate in an organized job-shadowing activity. 11.8.9 Participate in a community service project. 11.8.10 Construct a career portfolio.
APPROACHES STANDARD	♦ Locate employment opportunities. ♦ Identify job requirements for entry-level positions in the furniture and cabinetmaking industry. ♦ Identify general conditions for employment. ♦ Identify educational/training requirements for related furniture and cabinetmaking fields. ♦ Identify the elements of goal setting. ♦ Identify furniture and cabinetmaking related careers. ♦ Describe essential job interview skills. ♦ Identify the components of a career portfolio.

Academic Standards Correlation: English: 5.12.5, 6.12.5, 7.12.1, 7.12.3, 7.12.4, 7.12.5, 9.12.1

Content and Performance Standards

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

Performance Standard 11.9	**The student will demonstrate job-retention and lifelong learning skills.**
EXCEEDS STANDARD	♦ Maintain an electronic portfolio. ♦ Create a plan for lifelong learning. ♦ Create a presentation illustrating interpersonal skills needed for job retention. ♦ Adapt new knowledge and skills in changing situations. ♦ Analyze how work life is affected by families and how families are affected by work life.
MEETS STANDARD	11.9.1 Maintain an employment/career portfolio. 11.9.2 Explain strategies for balancing work and family roles. 11.9.3 Demonstrate understanding of the need for lifelong learning in a rapidly changing job market. 11.9.4 Describe strategies to maintain employment in the face of job reductions. 11.9.5 Develop long-term career planning strategies. 11.9.6 Describe various educational options needed for job retention. 11.9.7 Model sound workplace ethics, such as honesty, loyalty, punctuality, and initiative. 11.9.8 Demonstrate interpersonal skills needed for job retention.
APPROACHES STANDARD	♦ Describe the importance of a portfolio. ♦ Identify options for lifelong learning. ♦ Identify interpersonal skills needed for job retention. ♦ Identify jobs with opportunity for advancement. ♦ Describe the importance of career planning.

CROSSWALK OF FURNITURE AND CABINETMAKING STANDARDS AND ACADEMIC STANDARDS

Content Standard 1.0: The student will demonstrate safe work practices and tool/equipment usage while performing operations in the work environment.

Performance Indicators	Academic Standards
1.1.1, 1.1.2, 1.1.3, 1.1.7, 1.1.8, 1.1.9	**Science** N.12.A.4 Students know how to safely conduct an original scientific investigation using the appropriate tools and technology.
1.2.1, 1.2.2, 1.2.3, 1.2.5	**Science** N.12.A.4 Students know how to safely conduct an original scientific investigation using the appropriate tools and technology.

Content Standard 2.0: The student will demonstrate competency in mathematics.

2.1.1	**Math** 4.12.7 Apply the Pythagorean Theorem, its converse, properties of special right triangles, and right triangle trigonometry to solve practical problems.
2.1.2, 2.1.3	**Math** 1.12.1 Calculate and estimate sums, differences, products, quotients, powers, and roots using mental math, formulas, and algorithms. 3.12.4 Use and interpret consumer data (e.g., amortization tables, tax tables, and compound interest charts) to make informed financial decisions related to practical applications such as budget.

Content Standard 3.0: Students will demonstrate competence in planning, design and blueprint reading in furniture/cabinetmaking technology.

3.1.2	**Math** 3.12.5 Use relationships (e.g., proportions) and formulas (indirect measurement) to determine the measurement of unknown dimensions, angles, areas, and volumes to solve problems.
3.1.3	**Math** 4.12.1 Identify and use the properties of polygons (including interior and exterior angles) and elements of circles (e.g., angles, arcs, chords, secants and tangents) to solve practical problems. 4.12.8 Use tools, technology, and models to sketch, draw, and construct geometric figures in order to solve problems and to demonstrate the properties of geometric figures.
3.2.1	**English** 9.12.1 Use specific and varied vocabulary and apply standard English to communicate ideas.
3.3.1	**Math** 4.12.1 Identify and use the properties of polygons (including interior and exterior angles) and elements of circles (e.g., angles, arcs, chords, secants and tangents) to solve practical problems. 4.12.6 Use complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal, and angles in polygons to solve practical problems. 4.12.8 Use tools, technology, and models to sketch, draw, and construct

	geometric figures in order to solve problems and to demonstrate the properties of geometric figures. **Science** N.12.A.5 Students know models and modeling can be used to identify and predict cause-effect relationships.
3.3.2	**Math** 1.12.1 Calculate and estimate sums, differences, products, quotients, powers, and roots using mental math, formulas, and algorithms. 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/ mass. 4.12.8 Use tools, technology, and models to sketch, draw, and construct geometric figures in order to solve problems and to demonstrate the properties of geometric figures. **Science** N.12.A.5 Students know models and modeling can be used to identify and predict cause-effect relationships.
3.3.3	**Math** 1.12.1 Calculate and estimate sums, differences, products, quotients, powers, and roots using mental math, formulas, and algorithms. 3.12.3 Distinguish and differentiate among the structures, language and uses of systems of measures (e.g., linear, square units, cubic units); justify and communicate the differences between accuracy, precision, error, and tolerance in measurement; describe how each of these can affect solutions found in problem situations. **English** 4.12.6 Read and apply multi-step directions in order to perform complex procedures and tasks.
3.4.1, 3.4.2, 3.4.3	**Math** 1.12.1 Calculate and estimate sums, differences, products, quotients, powers, and roots using mental math, formulas, and algorithms. 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/ mass. 3.12.3 Distinguish and differentiate among the structures, language and uses of systems of measures (e.g., linear, square units, cubic units); justify and communicate the differences between accuracy, precision, error, and tolerance in measurement; describe how each of these can affect solutions found in problem situations. 3.12.5 Use relationships (e.g., proportions) and formulas (indirect measurement) to determine the measurement of unknown dimensions, angles, areas, and volumes to solve problems.
3.5.1, 3.5.2, 3.5.3	**Math** 1.12.1 Calculate and estimate sums, differences, products, quotients, powers, and roots using mental math, formulas, and algorithms. 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/ mass. 3.12.3 Distinguish and differentiate among the structures, language and uses of systems of measures (e.g., linear, square units, cubic units); justify and communicate the differences between accuracy, precision, error, and

	tolerance in measurement; describe how each of these can affect solutions found in problem situations. 3.12.4 Use and interpret consumer data (e.g., amortization tables, tax tables, and compound interest charts) to make informed financial decisions related to practical applications such as budget.

Content Standard 4.0: The student will demonstrate proper tool selection and usage in the work environment.

4.1.1, 4.1.2	**Math** 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/mass. 3.12.3 Distinguish and differentiate among the structures, language and uses of systems of measures (e.g., linear, square units, cubic units); justify and communicate the differences between accuracy, precision, error, and tolerance in measurement; describe how each of these can affect solutions found in problem situations.

Content Standard 6.0: The student will demonstrate a working knowledge of joinery, fasteners and adhesives.

6.3.4	**Science** P.12.A.5 Students know chemical reactions can take place at different rates, depending on a variety of factors (i.e., temperature, concentration, surface area, and agitation).

Content Standard 7.0: The student will identify wood products/materials used in the furniture and cabinetmaking industry and describe their characteristics and uses.

7.1.1	**Science** L.12.B.1 Students know cell structures and their functions. **English** 9.12.1 Use specific and varied vocabulary and apply standard English to communicate ideas.
7.3.4	**Science** P.12.A.5 Students know chemical reactions can take place at different rates, depending on a variety of factors (i.e., temperature, concentration, surface area, and agitation)..
7.4.4	**Science** P.12.A.5 Students know chemical reactions can take place at different rates, depending on a variety of factors (i.e. temperature, concentration, surface area, and agitation).

Content Standard 8.0: The student will demonstrate competence in various construction processes in the furniture and cabinetmaking industry.

8.1.1	**Math** 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/mass.
8.2.1	**Math** 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/mass.
8.3.2	**Math** 3.12.3 Distinguish and differentiate among the structures, language and uses of systems of measures (e.g., linear, square units, cubic units).
8.4.3, 8.4.4	**Math** 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/mass.
8.5.3	**Science** P.12.A.5 Students know chemical reactions can take place at different rates, depending on a variety of factors (i.e., temperature, concentration, surface area, and agitation).

Content Standard 9.0: The student will prepare a project and apply finishes to industry standards.

9.2.3	**Science** P.12.A.6 Students know chemical reactions either release or absorb energy.
9.3.3, 9.3.4	**Science** P.12.A.5 Students know chemical reactions can take place at different rates, depending on a variety of factors (i.e., temperature, concentration, surface area, and agitation). P.12.A.6 Students know chemical reactions either release or absorb energy.
9.4.3, 9.4.4	**Science** P.12.A.5 Students know chemical reactions can take place at different rates, depending on a variety of factors (i.e., temperature, concentration, surface area, and agitation). P.12.A.6 Students know chemical reactions either release or absorb energy.

Content Standard 10.0: The student will transport and install furniture and cabinets according to industry standards.

10.2.1, 10.2.2, 10.12.3	**Math** 1.12.1 Calculate and estimate sums, differences, products, quotients, powers, and roots using mental math, formulas, and algorithms. 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/ mass. 4.12.7 Apply the Pythagorean Theorem, its converse, properties of special right triangles, and right triangle trigonometry to solve practical problems.
10.3.1	**Math** 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/ mass. 4.12.7 Apply the Pythagorean Theorem, its converse, properties of special right triangles, and right triangle trigonometry to solve practical problems.
10.4.1, 10.4.3	**Math** 1.12.1 Calculate and estimate sums, differences, products, quotients, powers, and roots using mental math, formulas, and algorithms. 3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/ mass. 4.12.6 Use complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal, and angles in polygons to solve practical problems. 4.12.7 Apply the Pythagorean Theorem, its converse, properties of special right triangles, and right triangle trigonometry to solve practical problems.
10.4.2	**Science** P.12.A.5 Students know chemical reactions can take place at different rates, depending on a variety of factors (i.e., temperature, concentration, surface area, and agitation).

Content Standard 11.0: Students will achieve competence in workplace readiness, career development, and lifelong learning.

11.1.1, 11.1.2	**English** 10.12.2 Negotiate to arrive at consensus by proposing and examining possible options. 10.12.3 Identify and practice techniques such as setting time limits for speakers and deadlines for decision making to improve productivity of group discussion.
11.2.2	**English** 10.12.1 Participate in problem-solving conversations or group discussions by identifying, synthesizing, and evaluating data.
11.3.6	**English** 4.12.6 Read and apply multi-step directions in order to perform complex procedures and tasks.
11.3.8	**English** 6.12.5 Edit for use of standard English.

	7.12.1 Apply the rules of usage, grammar, and capitalization with few significant errors; use modifiers, parallel structure, and subordination correctly in writing. 7.12.3 Use rules of punctuation; manipulate conventions for emphasis in writing. 7.12.4 Use rules of capitalization. 7.12.5 Demonstrate conventional spelling.
11.4.5	**Math** 3.12.4 Use and interpret consumer data (e.g., amortization tables, tax tables, and compound interest charts) to make informed financial decisions related to practical applications such as budget.
11.8.1, 11.8.2	**English** 6.12.5 Edit for use of standard English. 7.12.1 Apply the rules of usage, grammar, and capitalization with few significant errors; use modifiers, parallel structure, and subordination correctly in writing. 7.12.3 Use rules of punctuation; manipulate conventions for emphasis in writing. 7.12.5 Demonstrate conventional spelling. 9.12.1 Use specific and varied vocabulary and apply standard English to communicate ideas.
11.8.3	**English** 5.12.5 Write summaries or abstracts that distill large amounts of information into clear, concise prose. 7.12.4 Use rules of capitalization.
11.8.4	**English** 7.12.5 Demonstrate conventional spelling. 9.12.1 Use specific and varied vocabulary and apply standard English to communicate ideas.
11.8.5, 11.8.6	**English** 7.12.3 Use rules of punctuation; manipulate conventions for emphasis in writing. 7.12.5 Demonstrate conventional spelling. 9.12.1 Use specific and varied vocabulary and apply standard English to communicate ideas.