



**Connecticut  
CAREER & TECHNICAL  
EDUCATION**

**PERFORMANCE  
STANDARDS  
&  
COMPETENCIES**

**2015 Edition  
& Common Core State Standards**

State Department of Education  
Academic Office  
Hartford, CT 06106-7049

## Introduction

### **Career and Technical Education: A Definition**

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The Carl D. Perkins Act of 2006 defines Career and Technical Education as:

Organized educational activities that:

- (A)
  - (i) offer a sequence of courses that provide individuals with coherent and rigorous content aligned with challenging standard relevant technical knowledge and skills needed to prepare for further education and careers in current or emerging professions;
  - (ii) provide technical skill proficiency, an industry-recognized credential, a certificate, or an associate degree;
  - (iii) may include prerequisite courses (other than a remedial course) that meet the requirements of this subparagraph;
- (B) include competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of an industry, including entrepreneurship, of an individual.

### **Career and Technical Education - SKILL PROFICIENCY**

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- (2) (A) (ii) Student attainment of career and technical skill proficiencies, including student achievement on technical assessments that are aligned with industry-recognized standards, if available and appropriate.

## **Career and Technical Education Performance Standards and Competencies**

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The foundation document for Connecticut in the process of improving the quality of teaching and learning in CTE, is the Connecticut Performance Standards & Competencies (PS&C) in each of the 21 areas of concentration, representing nationally aligned standards and competencies (2015 version).

The growth and development of CTE in our comprehensive secondary schools with its broad variety of elective courses in the seven CTE program areas demonstrate the commitment of teachers and schools to serve the interests and future career interests of students. The 21 areas of concentration represent the most prominent categories of CTE course sequences in Connecticut.

The PS&C are designed to assist Connecticut CTE teachers in the measured improvement of instruction and learning, enhancing academic achievement, and better preparing students for the Connecticut statewide CTE assessment.

### **CONCENTRATOR (definition)**

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A “Concentrator” is any student enrolled in any course (CTE or academic) that specifically addresses the Connecticut CTE Performance Standards and Competencies in one of Connecticut’s 21 areas of concentration. Although course credits vary from  $\frac{1}{4}$  credit to a full credit, a concentrator must accumulate a minimum of two full credits to reach the threshold of a concentrator. To address the acquisition of competencies, courses included may be academic and/or from different CTE program areas. A student may be a concentrator in more than one area of concentration in the same school year; or for more than one year if that student continues to receive instruction in courses that include state competencies in one or more of the areas of concentration. The definition of a concentrator in Agriculture is a student enrolled in a Regional Agricultural Science and Technology Education Center and is a senior who has completed the performance standards and competencies in one of the agriculture areas of concentration (Animal Science, Plant Science, Agriculture Mechanics, Natural Resources or Aquaculture) and has successfully met the performance elements of premier leadership, personal growth, and career success through involvement in the National FFA Organization and a planned Supervised Agricultural Experience (SAE) project.

## **CUT SCORE**

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To evaluate the Connecticut’s status as part of the negotiated “plan for continuous improvement” under the Carl D. Perkins legislation, an individual student test score has been established to serve as an initial measure by which we determine annual statewide progress. Connecticut has identified 65% as the cut score, a baseline of individual student test results. Since the inception of the statewide CTE assessment, Connecticut has reported to the OVAE/USOE the aggregate percentage of all CTE students who achieve a 65% score or better on their respective CTE assessment. The 65% cut score is not to be construed as a passing/failing score.

## **NEGOTIATED PERFORMANCE LEVELS**

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Under sub-indicator (1S2) Technical Skill Attainment, Connecticut has negotiated the annual performance levels for the statewide CTE assessment program. These performance levels represent the percentage of all statewide CTE concentrators who should score at, or above, the 65% cut score (threshold score) in order for Connecticut to reach its annual federal goals.

## **Career and Technical Education Areas of Concentration**

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### **Agricultural Education**

- Agriculture Mechanics
- Animal Science
- Aquaculture
- Natural Resources and Environmental
- Plant Science

### **Business and Finance Technology**

- Accounting
- Business Management
- Computer Information Systems
- Personal Finance

### **Cooperative Work Education**

- Cooperative Work Education

### **Family and Consumer Sciences**

- Early Childhood Education and Services
- Nutrition and Food Production
- Culinary and Food Production
- Textiles and Design

### **Marketing Education**

- Marketing Education

### **Medical Careers Education**

- Medical Careers Education

### **Technology Education**

- Automotive Technology
- Computer Aided Drafting and Design
- Engineering Technology
- Digital Video Production Systems
- Wood Technology

# **Common Core State Standards**

Since the enactment of the Carl D. Perkins reauthorization legislation of 1998, all states have been required to integrate academic learning into CTE courses. Hence, our Connecticut CTE courses in secondary schools have become an enhancement for academic achievement. Since 2007, the Connecticut Statewide CTE Assessment has contextually applied mathematics and reading competencies from the Connecticut Academic Performance Test (CAPT) into our tests. Beginning in this assessment year, 2013, the statewide CTE assessment will contextually integrate the COMMON CORE competencies for mathematics and reading into all 21 tests.

## **Common Core - MATHEMATICS STANDARDS**

- 1) **EXPLAIN THE MEANING OF A PROBLEM AND LOOK FOR ENTRY POINTS TO ITS SOLUTION.** They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.
- 2) **MAKE SENSE OF QUANTITIES AND THEIR RELATIONSHIPS IN PROBLEM SITUATIONS.** They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.
- 3) **INTERPRET AND USE STATED ASSUMPTIONS, DEFINITIONS, AND PREVIOUSLY ESTABLISHED RESULTS IN CONSTRUCTING ARGUMENTS.** They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others,

and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

- 4) **APPLY THE MATHEMATICS LEARNED TO SOLVE PROBLEMS ARISING IN EVERYDAY LIFE, SOCIETY, AND THE WORKPLACE.** In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.
- 5) **CONSIDER THE AVAILABLE TOOLS WHEN SOLVING A MATHEMATICAL PROBLEM.** These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

- 6) **COMMUNICATE PRECISELY TO OTHERS THROUGH THE USE OF MATHEMATICAL EXPLANATIONS AND DEFINITIONS.** They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.
- 7) **EXAMINE MATHEMATICAL PROBLEMS TO DISCERN A PATTERN OR STRUCTURE.** Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see  $7 \times 8$  equals the well-remembered  $7 \times 5 + 7 \times 3$ , in preparation for learning about the distributive property. In the expression  $x^2 + 9x + 14$ , older students can see the 14 as  $2 \times 7$  and the 9 as  $2 + 7$ . They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see  $5 - 3(x - y)^2$  as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers  $x$  and  $y$ .
- 8) **DETERMINE IF CALCULATIONS ARE REPEATED, AND LOOK BOTH FOR GENERAL METHODS AND FOR SHORTCUTS.** Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation  $(y - 2)/(x - 1) = 3$ . Noticing the regularity in the way terms cancel when expanding  $(x - 1)(x + 1)$ ,  $(x - 1)(x^2 + x + 1)$ , and  $(x - 1)(x^3 + x^2 + x + 1)$  might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

## **Common Core - READING STANDARDS**

- 1) Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the accounts.
- 2) Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- 3) Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
- 4) Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11-12 texts and topics.
- 5) Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
- 6) Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.
- 7) Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- 8) Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.
- 9) Synthesize information from a range of sources (e.g., tests, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
- 10) Read and comprehend science/technical texts in grades 11-CCR (college career readiness) text complexity band independently and proficiently.

# **Agricultural Education**

# Agricultural Education

## CONTENT AREA— Agriculture Mechanics

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Agriculture Mechanics: Understand the concepts and skills necessary related to agricultural mechanics technology.**

1. Identify and explain the uses of the following woodworking tools used in agricultural construction: circular saw, drill press, jig/sabre saw, reciprocating saw, table saw, orbital sander, belt sander, router, portable drill, and miter saw.
2. Identify the following from a technical drawing of an agricultural structure: square feet of the building, height of the building, number of rafters/trusses, and the scale of the drawing.
3. List the steps involved in building with concrete, including calculating the amount of concrete required for a job, preparing the base, constructing the forms, pouring the concrete, finishing, and curing.
4. Define and measure amps, volts, and watts.
5. Describe the process of installing the following electrical circuits: duplex receptacle, single pole switch with light, and three-way switch with light.
6. Demonstrate the following skills in plumbing: soldering/sweating a copper joint, cementing PVC fittings, and threading black pipe.
7. Identify personal protection equipment (PPE) used in welding.
8. Demonstrate how to safely setup, use, and turn off oxy-acetylene welding equipment.
9. Demonstrate how to safely set up, use, and turn off shielded metal arc welding (SMAW) equipment.
10. Demonstrate how to safely set up, use, and turn off a gas metal arc welding system (GMAW).
11. Use the five-digit AWS classification system for selecting electrodes used in shielded metal arc welding (SMAW).
12. Analyze the following qualities of welding beads: current, arc length, and travel speed.
13. Identify the safety and operational procedures and service intervals based on a tractor or equipment operator's manual.
14. Utilize a Briggs and Stratton repair manual to find engine specifications.
15. Follow the operator's manual to maintain tractors and skid steers.

# Agricultural Education

## CONTENT AREA— Agriculture Mechanics

### PERFORMANCE STANDARDS AND COMPETENCIES

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**B. Safety with Agricultural Chemicals: Understand the concepts and procedures for handling, usage, and storage of agricultural chemicals.**

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16. Identify the following from the label of an agricultural chemical container: appropriate use, warning signs, signal words, precautionary statements, EPA Registration Number, directions for use, storage, and disposal.
17. Identify the following from a Safety Data Sheets (SDS): first aid measures, firefighting measures, handling and storage, and personal protection equipment (PPE).

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**C. Career Exploration and Development: Understand the diversity of careers related to the agricultural industry and strategies to acquire and advance in an agricultural career.**

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18. Identify 21st century skills required for all careers in agriculture.
19. Demonstrate the essential skills that are part of a job search, including preparing the cover letter, resume, application, and participating in the interview process.
20. Explain the purpose and types of Supervised Agriculture Experience programs (SAE).

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**D. Leadership, Personal Growth, and Career Success: Understand the concepts, strategies, and tools needed, which contribute to premier leadership, personal growth, and career success through the participation in FFA.**

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21. Identify FFA opportunities, including individual and chapter awards, career development events, leadership skills development, and FFA service engagement.
22. Explain the purpose of using parliamentary procedure in FFA meetings.
23. Demonstrate knowledge of parliamentary procedures such as use of the gavel, making and amending main motions, debating, and voting.
24. Exhibit the skills needed to lead a meeting or activity that engages all participants in the process.

# Agricultural Education

## CONTENT AREA— Animal Science

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Animal Science: Understand the concepts and skills necessary related to animal science technology.**

1. Identify the following breeds of dogs: Labrador Retriever, Golden Retriever, German Shepherd, Yorkshire Terrier, Beagle, Boxer, Poodle, Rottweiler, Greyhound, Dachshund, Bulldog, and Doberman Pinscher.
2. Identify the following breeds of cats: Maine Coon, Bengal, Russian Blue, Abyssinian, Ragdoll, American Shorthair, Siamese, Manx, Persian, and Himalayan.
3. Identify the following breeds of pocket pets: Sugar Glider, Gerbil, Hamster, Guinea Pig, Ferret, Chinchilla, white mice, and rats.
4. Identify the following breeds of rabbits: Netherland Dwarf, Dutch, Flemish Giant, French Lop, American Chinchilla, Holland Lop, Satin, English Angora, Mini Rex, and Himalayan.
5. Identify the following breeds of birds: Cockatiel, Cockatoos, Parakeets, African Grey, and Blue and Gold Macaw.
6. Identify the following breeds of reptiles and amphibians: Bearded Dragons, Iguana, Chameleon, Gecko, Boa Constrictor, Corn Snake, Red Ear Slider, Box Turtle, Tree Frog, and Toad.
7. Identify the following breeds of domestic livestock used for dairy: Holstein-Friesian, Jersey, Guernsey, Brown Swiss, Ayrshire, and Milking Shorthorn.
8. Identify the following breeds of domestic livestock used for beef: Angus, Hereford, Charolais, Simmental, Belted Galloways, Scotch Highlanders, and Texas Longhorns.
9. Identify the following breeds of sheep: Dorset, South Downs, Cheviot, Romney, Suffolks, Merino, and Hampshires.
10. Identify the following breeds of goats: Toggenburg, Alpine, Nubian, Angora, Boer, Pygmy, and Saanens.
11. Identify the following breeds of swine: Yorkshire, Hampshire, Berkshire, Duroc, American Landrace, Potbellied, and Hereford.
12. Identify the following breeds of equine: Appaloosa, Arabian, Quarter Horse, Morgan, Thoroughbred, Saddlebred, Paint, Belgian, Clydesdale, Percheron, Friesian, Hackney, Haflinger, Shetland, Hanoverian, and Andalusian.
13. Evaluate preventive measures for controlling and limiting the spread of common diseases, and common parasites among companion and domestic animals, including vaccination, sanitation, observation, isolation, waste disposal, proper handling, protective clothing, and hand washing.

# Agricultural Education

## CONTENT AREA— Animal Science

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Animal Science: Understand the concepts and skills necessary related to animal science technology.**

14. Recognize illnesses and disorders based on symptoms and problems caused by disease, parasites, and disorders among companion, lab and/or domestic animals.
15. Identify and explain the function of the six nutrients required for life.
16. Explain the feed ingredients, guaranteed analysis, and feeding guideline components of a feed label/tag.
17. Determine the most cost effective diet using feeding guidelines and the price per pound of more than one feed.
18. Interpret domestic livestock and companion animal behaviors and outline safety procedures for working with those species.
19. Explain the importance of bio-security in relation to domestic livestock and companion animals.
20. Explain genetic inheritance in domestic livestock and companion animals.
21. Identify the uses, advantages, and disadvantages of natural breeding and artificial insemination.
22. Compare and contrast animal welfare in relation to domestic livestock and companion animals.
23. Describe the locations and functions of domestic livestock and companion animal organs and their systems, including respiratory, circulatory, reproductive, endocrine, urinary, and digestive.
24. Identify facilities needed to house and manage domestic livestock and companion animals safely and efficiently.

#### **B. Safety with Agricultural Chemicals: Understand the concepts and procedures for handling, usage, and storage of agricultural chemicals.**

25. Identify the following from the label of an agricultural chemical container: appropriate use, warning signs, signal words, precautionary statements, EPA Registration Number, directions for use, storage, and disposal.
26. Identify the following from a Safety Data Sheets (SDS): first aid measures, firefighting measures, handling and storage, and personal protection equipment (PPE).

# Agricultural Education

## CONTENT AREA— Animal Science

### PERFORMANCE STANDARDS AND COMPETENCIES

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**C. Career Exploration and Development: Understand the diversity of careers related to the agricultural industry and strategies to acquire and advance in an agricultural career.**

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27. Identify 21st century skills required for all careers in agriculture.
  28. Demonstrate the essential skills that are part of a job search, including preparing the cover letter, resume, application, and participating in the interview process.
  29. Explain the purpose and types of Supervised Agriculture Experience programs (SAE).
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**D. Leadership, Personal Growth, and Career Success: Understand the concepts, strategies, and tools needed, which contribute to premier leadership, personal growth, and career success through the participation in FFA.**

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30. Identify FFA opportunities, including individual and chapter awards, career development events, leadership skills development, and FFA service engagement.
31. Explain the purpose of using parliamentary procedure in FFA meetings.
32. Demonstrate knowledge of parliamentary procedures such as use of the gavel, making and amending main motions, debating, and voting.
33. Exhibit the skills needed to lead a meeting or activity that engages all participants in the process.

# Agricultural Education

## CONTENT AREA— Aquaculture

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Aquaculture: Understand the concepts and skills related to aquaculture production and management.**

1. Classify the following species of aquatic organisms as fresh water, marine, or diadromous, and by their genus and species: tilapia-Oreochromis mossambicus and Oreochromis nilotica, Atlantic salmon- Salmo salar, chinook salmon- Oncorhynchus tshawyscha, coho salmon- Oncorhynchus kisutch, eastern oyster- Crassostrea virginica, hard clam-Mercinaria mercinaria, American lobster- Homarus americanus, sugar kelp- Saccharina latissima, rainbow trout- Oncorhynchus mykiss, Brook Trout-Salvelinus fontinalis, brown trout- Salmo trutta, channel catfish- Ictalurus punctatus, blue catfish-Ictalurus furcatus, white catfish-Ictalurus catus.
2. Identify the following types of aquaculture systems: raceways, ponds, recirculating systems, and net pens or cages.
3. Identify and describe the following parts of a recirculating aquaculture system (RAS): tank, sump or reservoir, pump, solid waste filter, U/V sterilizer, heat exchanger, biofilter, and aeration.
4. Describe how the biofilter of a recirculating aquaculture system (RAS) converts ammonia to nitrite, and nitrite to nitrate.
5. Explain how aquaponics can be utilized to enhance sustainable aquaculture practices by reducing water consumption and waste production.
6. Identify and describe how the following environmental factors impact aquaculture production: temperature, salinity, ammonia, nitrate, nitrite, dissolve oxygen, and pH.
7. List and describe the following symptoms: pop-eyes, piping, flashing, fin erosion, abnormal behavior, and skin abnormalities such as lesions and scale loss.
8. List and define the categories of infectious diseases: bacterial, fungal, viral, and parasitic.
9. List and define the categories of non-infectious diseases: nutritional, environmental, chemical, and physiological.
10. Describe the reasons for grading both before and during harvesting.
11. List and describe how the following species are detrimental to aquaculture production: sea stars, oyster drills, zebra mussels, lice, parasitic copepods, and worms.
12. Identify the following external morphological features of a finfish: dorsal, pectoral, pelvic, anal, caudal and adipose fins, lateral line, and operculum.
13. Identify the following external morphologic features of a crustacean: carapace, abdomen, walking legs, and claws.
14. Diagram the life cycle of tilapia, Atlantic salmon, eastern oysters, and American lobsters.
15. List and describe the following nutritional requirements in aquaculture production: proteins, carbohydrates, fats, vitamins, and minerals.

# Agricultural Education

## CONTENT AREA— Aquaculture

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Aquaculture: Understand the concepts and skills related to aquaculture production and management.**

16. Describe free access feeding with demand feeders, versus schedule feeding by hand or automated feeder.
17. Describe the function of the following agencies as related to aquaculture: NOAA, DEEP, EPA, World Aquaculture Society, SeaGrant, FDA, USDA, Army Corps of Engineers, and United States Coast Guard.

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# Agricultural Education

## CONTENT AREA— Natural Resources and Environmental

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Natural Resources and Environmental Technologies: Understand the concepts and skills necessary related to natural resources and environmental management.**

1. Define and identify the following renewable resources: water, trees, fish, wildlife, sunlight, and air.
2. Define and identify the following non-renewable resources: minerals, soil, and fossil fuels.
3. Define threatened, endangered, and extinct in terms of wildlife.
4. Identify the ecosystem structure in terms of food web, biodiversity, and carrying capacity.
5. Identify the following habitat types in Connecticut: deciduous forest, coniferous forest, wetland, field or meadow, tidal marsh, and edge.
6. Define point source and non-point source pollution.
7. Define and describe the principal functions of a watershed.
8. Define invasive species and describe their impact on the New England environment.
9. Describe the process of ecological succession in New England.
10. Describe how laws can be used as a fish and wildlife management technique in New England.
11. Identify the following components of a topographical map: contour lines, wetlands, buildings, compass, and scale.
12. Describe basic applications of global positioning systems in natural resources.
13. Identify recreational uses of natural resources in New England.
14. Identify the following water quality indicators: pH, temperature, nitrates, nitrites, ammonia, dissolved oxygen, and turbidity.
15. Demonstrate use of a dichotomous key to identify trees, fish, and wildlife.
16. Identify the following tools in natural resources: GPS unit, diameter tape, telemetry unit, seines, aquatic net, water meter, animal tag or band, Biltmore stick, Secchi disk, analog refractometer, and hydrometer.

# Agricultural Education

## CONTENT AREA— Natural Resources and Environmental

### PERFORMANCE STANDARDS AND COMPETENCIES

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# Agricultural Education

## CONTENT AREA— Plant Science

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Plant Science: Understand the concepts and skills necessary related to plant science technology.**

1. Identify and describe the function(s) of the following plant parts: leaf, blade, petiole, flower, stamen, pistil, stem, nodes, roots, and root hairs.
2. Identify the genus and species (specific epithet), cultivar, and variety of a scientific plant.
3. Explain requirements necessary for photosynthesis to occur and identify the products and by-products of photosynthesis.
4. Describe how soil texture affects drainage and plant growth.
5. Describe the following components of growing media: perlite, vermiculite, and peat.
6. Describe soil pH and its effect on plant growth.
7. Identify the following from a label of a fertilizer container: percentage of N, P, and K, and calculate the actual amount of the nutrient(s) in the container.
8. Describe the role of N, P, and K in regards to vegetative growth, root development, seed production, and plant stress.
9. Explain the life cycle of annuals, biennials, and perennial plants.
10. Describe asexual propagation techniques by cuttings, division, grafting, and tissue culture.
11. Describe the process of plant pollination and fertilization.
12. Describe favorable conditions for germination.
13. Identify advantages and disadvantages of hybrid plants.
14. Describe Integrated Pest Management (IPM) strategies.
15. Explain how greenhouses promote plant growth through light, air movement, temperature, and humidity control.
16. Explain focal point, balance, proportion, and scale as they are applied to floral design.
17. Demonstrate appropriate conditioning and storage of cut flowers.
18. Select and safely use the following hand tools and equipment in the landscape industry: garden rake, leaf rake, shovel, spade, hand shears, loppers, rotary spreader, and drop spreader.

# Agricultural Education

## CONTENT AREA— Plant Science

### PERFORMANCE STANDARDS AND COMPETENCIES

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**B. Safety with Agricultural Chemicals: Understand the concepts and procedures for handling, usage, and storage of agricultural chemicals.**

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19. Identify the following from the label of an agricultural chemical container: appropriate use, warning signs, signal words, precautionary statements, EPA Registration Number, directions for use, storage, and disposal.
  20. Identify the following from a Safety Data Sheets (SDS): first aid measures, firefighting measures, handling and storage, and personal protection equipment (PPE).
- 

**C. Career Exploration and Development: Understand the diversity of careers related to the agricultural industry and strategies to acquire and advance in an agricultural career.**

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21. Identify 21st century skills required for all careers in agriculture.
  22. Demonstrate the essential skills that are part of a job search, including preparing the cover letter, resume, application, and participating in the interview process.
  23. Explain the purpose and types of Supervised Agriculture Experience programs (SAE).
- 

**D. Leadership, Personal Growth, and Career Success: Understand the concepts, strategies, and tools needed, which contribute to premier leadership, personal growth, and career success through the participation in FFA.**

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24. Identify FFA opportunities, including individual and chapter awards, career development events, leadership skills development, and FFA service engagement.
25. Explain the purpose of using parliamentary procedure in FFA meetings.
26. Demonstrate knowledge of parliamentary procedures such as use of the gavel, making and amending main motions, debating, and voting.
27. Exhibit the skills needed to lead a meeting or activity that engages all participants in the process.

## **Business and Finance Technology**

# Business and Finance Technology

## CONTENT AREA— Accounting

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Accounting Profession: Explain the role that accountants play in business and society.**

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1. Describe career opportunities in the accounting profession.
  2. Explain the need for a code of ethics in accounting and ethical responsibilities required of accountants.
- 

**B. Accounting Principles: Identify and describe generally accepted accounting principles (GAAP/IFRS) and explain how the application of these principles impacts the recording of financial transactions and the preparation of financial statements.**

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3. Define assets, liabilities, equity, revenue, expenses, gains, and losses.
  4. Describe methods for controlling and safeguarding cash.
  5. Record transactions affecting accounts receivable, including uncollectible accounts, write-offs, and recoveries.
  6. Explain the difference between the periodic and perpetual inventory methods.
  7. Determine the cost of inventory for businesses and apply appropriate valuation methods.
  8. Identify, calculate, and record depreciation and depletion and explain the impact on the financial statements.
  9. Apply transactions for accounts payable and other short-term debt.
  10. Record transactions for long-term debt instruments.
  11. Describe and record equity-related transactions.
  12. Describe and record revenue-related transactions.
  13. Analyze transactions involving accruals.
  14. Describe and record expense-related transactions.
- 

**C. Accounting Process: Complete the various steps of the accounting cycle in order to prepare financial statements.**

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15. Analyze and describe how basic business transactions impact the accounting equation.
16. Explain the need for adjusting entries and record basic adjusting entries.
17. Complete the closing process.

# Business and Finance Technology

## CONTENT AREA— Accounting

### PERFORMANCE STANDARDS AND COMPETENCIES

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**D. Financial Reports: Develop an understanding and working knowledge of financial statements.**

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18. Describe the users and uses of financial information.
  19. Describe the information provided in each financial statement and how the statements relate.
- 

**E. Financial Analysis: Access the financial condition and operating results of a company and analyze and interpret financial statements and information to make informed business decisions.**

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20. Calculate component percentages.
  21. Discuss the information that can be obtained from analyzing financial statements.
- 

**F. Special Applications: Apply appropriate accounting principles to payroll.**

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22. Prepare and maintain payroll records.
-

# Business and Finance Technology

## CONTENT AREA— Business Management

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Business Management: Analyze the management functions and their implementation and integration within the business environment.**

1. Discuss the characteristics of effective and ineffective leaders.
2. Compare the forms of business ownership.
3. Identify effective communication skills.
4. Describe the advantages and disadvantages of networking to achieve personal goals.
5. Define business ethics and social responsibility.
6. Identify recruitment selection tools and determine why they are used, including interviews, tests, and reference checks.
7. Explain why employees are evaluated.
8. Explain the role of labor unions and the process of collective bargaining.
9. Discuss the advantages and disadvantages of using technology in business.
10. Understand the components of a SWOT Analysis.
11. Identify and define financial statements.
12. Identify sources of financing.
13. Identify the advantages of a diverse workforce.

#### **B. Economics: Describe and apply the decision making process for allocating scarce resources.**

14. Define scarcity and why it requires individuals, governments, and societies to make choices.
15. Compare and contrast the different types of economic systems such as market and command.
16. Explain how change in one component of circular flow of economic activity affects other components.
17. Describe different kinds of economic institutions in the U.S. economy, including households, businesses, financial institutions, government agencies, labor unions, and nonprofit organizations.
18. Explain and give illustrations of the law of demand, law of supply, and equilibrium price.
19. Identify the basic characteristics of monopoly, monopolistic competition, and oligopoly and give examples of each.
20. Explain how government's redistribution of income through taxation, spending, and assistance or entitlement programs affect the well being of people and businesses in an economy.

# Business and Finance Technology

## CONTENT AREA— Business Management

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **C. Entrepreneurship: Recognize characteristics of an entrepreneur and determine opportunities, problem recognition, and pursuit.**

21. Identify the characteristics of a successful entrepreneur.
22. List the advantages and disadvantages to being an entrepreneur.
23. Discuss the impact of entrepreneurs being ethically and socially responsible.
24. Describe the application of the marketing mix, including product, place, price, and promotion.
25. Identify the total cash needed to start a business, including start-up costs, ongoing operational expenses, and cash reserves.
26. Describe the impact incomplete and/or inaccurate business records have on a business.
27. Calculate the number of products that need to be sold in order to make a profit using break-even analysis.
28. Identify the information to be included in each component of a business plan.
29. Compare and contrast the advantages and disadvantages of the various forms of business ownership.
30. Explain ways entrepreneurs can protect themselves from risk.

#### **D. International Business: Explain the role of international business and how it impacts business at the local, state, national, and international levels.**

31. Explain the difference between an international and a domestic company.
32. Identify distinctive social and cultural factors that affect business activities, including time, workday, workweek, schedules, and holidays.
33. Identify cultural differences in dress, gestures, and social behaviors throughout the world.
34. Identify and differentiate between types of governments.
35. Analyze the impact of political environments on international business.
36. Identify reasons why countries trade with each other.
37. Discuss why governments impose trade barriers such as quotas, tariffs, licensing requirements, and exchange rate controls and offer trade incentives.
38. Demonstrate awareness, appreciation, and respect for different languages and cultures.
39. Recognize appropriate etiquette in communication in a multicultural environment.
40. Define basic terms such as currency, currency exchange, and barter and explain how currency exchange rates affect business transactions.
41. Describe how the international business environment affects currency value and prices charged in international markets.

# Business and Finance Technology

## CONTENT AREA— Business Management

### PERFORMANCE STANDARDS AND COMPETENCIES

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**E. Business Law: Analyze the relationship between ethics and the law and describe the sources of the law, the court system structure, and classifications of procedural and substantive law.**

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42. Describe the difference between a legal and ethical responsibility.
43. Describe the basic structure (hierarchy) of the national and state court systems.
44. Distinguish between categories of a crime such as treason, felony, and misdemeanor.
45. Explain how offer and acceptance can create contractual rights and duties.
46. List the essential information that should be included in writing under the statute of frauds.
47. List the ways a contract can be discharged.
48. Explain the doctrine of employment-at-will.
49. Distinguish among liens, licenses, and easements and explain the differences.
50. List and define the types of intellectual property, including trademark, trade name, trade dress, copyright, patent, and trade secret.
51. Distinguish between common law and a ceremonial marriage.
52. Explain how a will may be modified or revoked.

# Business and Finance Technology

## CONTENT AREA— Computer Information Systems

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Impact on Society: Assess the impact of information technology in a global society.**

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1. Describe the impact of technology on the knowledge and skills needed for success in the workplace.
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**B. Devices and Components: Identify devices and components appropriate for specific tasks.**

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2. Identify the purpose, operation, and care of all types of devices and components.
  3. Identify examples of emerging hardware technologies.
- 

**C. Operating Systems and Utilities: Describe various types of operating systems and utilities.**

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4. Manage files and folders.
- 

**D. Input Technologies: Use various input technologies to enter and manipulate information appropriately.**

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5. Develop proper input techniques such as keying, scanning, digital cameras, virtual keypad, recognition of developing technologies, the use of a multi-touch screen, mouse/pad or stylus, speech recognition, student response systems, digital inking, and any new emerging technology.
  6. Apply a variety of input technologies to maximize productivity.
- 

**E. Applications: Identify, evaluate, select, install, use, upgrade, troubleshoot, and customize applications.**

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7. Evaluate and select the appropriate applications to productively complete tasks.
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**F. Digital Media: Use and create digital media.**

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8. Identify and select appropriate delivery methods and tools for digital media projects.
9. Use elements of digital and visual literacy appropriately.

# Business and Finance Technology

## CONTENT AREA— Computer Information Systems

### PERFORMANCE STANDARDS AND COMPETENCIES

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#### **G. Web Development and Design: Design, develop, test, implement, update, and evaluate web solutions.**

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10. Identify and apply appropriate design concepts and create web pages.
  11. Identify client and target audience needs.
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#### **H. Programming and Application Development: Design, develop, test, and implement programs and applications.**

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12. Identify and define object-oriented programming terminology.
  13. Identify and explain programming structures.
- 

#### **I. Networking Infrastructure and Security: Develop skills to design, deploy, and administer networks and telecommunication systems.**

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14. Identify basic network connectivity concepts.
15. Identify and explain privacy issues within an organization.

# Business and Finance Technology

## CONTENT AREA— Personal Finance

### PERFORMANCE STANDARDS AND COMPETENCIES

**A. Personal Decision Making: Use a rational decision-making process as it applies to the roles of citizens, workers, and consumers.**

1. Define and give examples of economic wants and needs.
2. Analyze the effects of ethics on business and financial management decisions.
3. Differentiate between types of decisions and identify which types should be used in a formal decision-making process.

**B. Earning and Reporting Income: Identify various forms of income and analyze factors that affect income as part of the career decision-making process.**

4. Analyze how career choice, education, and skills affect income and goal attainment.
5. Calculate net pay.
6. Identify benefits as a component of total income.

**C. Managing Finances and Budgeting: Develop and evaluate a budget plan.**

7. Construct and use a personal budget plan and evaluate it according to short- and long-term goals.
8. Categorize and classify expenses as fixed or variable.

**D. Saving and Investing: Evaluate savings and investment options to meet short- and long-term goals.**

9. Explain how and why the stock market works.
10. Analyze the power of compounding and the importance of starting early in implementing a plan of saving and investing.
11. Describe the advantages and disadvantages of various savings and investing plans.
12. Explain the role of savings and investing in creating a financial plan.
13. Contrast the impact of simple interest versus compound interest on savings.

# Business and Finance Technology

## CONTENT AREA— Personal Finance

### PERFORMANCE STANDARDS AND COMPETENCIES

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**E. Buying Goods and Services: Apply a decision-making model to maximize consumer satisfaction when buying goods and services.**

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14. Describe and give examples of consumer rights, responsibilities, and remedies.
  15. Identify the costs of utilities, services, maintenance, and other expenses involved in independent living.
  16. Explain how a consumer can identify and report fraudulent behavior and practices observed on the Internet.
- 

**F. Banking and Financial Institutions: Evaluate services provided by financial deposit institutions to transfer funds.**

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17. Identify the rights and responsibilities associated with using a checking account.
  18. Differentiate among types of electronic monetary transactions offered by various financial institutions.
  19. Evaluate products and services and related costs associated with financial institutions in terms of personal banking needs.
  20. Describe and demonstrate the steps involved in the bank reconciliation process.
- 

**G. Using credit: Analyze factors that affect the choice of credit, the cost of credit, and the legal aspects of using credit.**

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21. Describe the risks and responsibilities associated with using credit.
  22. Identify and explain methods of establishing and maintaining a good credit rating.
  23. Explain credit ratings and credit reports and describe why they are important to consumers.
  24. Identify specific steps that consumers can take to minimize their exposure to identity theft.
- 

**H. Protecting Against Risk: Analyze choices available to consumers for protection against risk and financial loss.**

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25. Identify risk in life and how to gain protection against the consequences of risk.
26. Identify the type of insurance associated with different types of risk such as automobile, personal and professional liability, home and apartment, health, life, long-term care, and disability.

## **Cooperative Work Education**

## Cooperative Work Education

### CONTENT AREA— Cooperative Work Education

#### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Career Readiness: Assess and identify career interests, aptitudes, and options in developing a career plan.**

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1. Describe attitudes and ethics important to career success.
2. Determine personal strengths, talents, values, and interests related to various jobs and careers in order to maximize career potential.
3. Identify the various research tools available in the career exploration process such as computer-assisted programs, social media sites, industry tours, job shadows, career fairs, and the Internet.
4. Evaluate postsecondary opportunities related to career interests, including certification, licensing, apprenticeships, college, and military options.
5. Identify skills necessary for employment in the global workforce.
6. Describe the purpose of a resume and cover letter.
7. Analyze the steps in a job search, including the cover letter, resume, application, and participating in the interview process
8. Identify ways to develop and maintain professional relationships to enhance career success.

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**B. Career Acquisition: Identify skills, aptitudes, and ethics required for employment acquisition in a competitive marketplace.**

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9. Describe the elements of effective oral and written communication skills necessary for employment.
10. Identify the resources necessary to conduct a job search.
11. Use an established network of professionals and social media connections to assist in a job search.
12. Describe employability skills, including job search, job selection, and interviewing.
13. Examine components of a wage benefit package.

# Cooperative Work Education

## CONTENT AREA— Cooperative Work Education

### PERFORMANCE STANDARDS AND COMPETENCIES

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**C. Career Retention: Demonstrate mastery of the entry-level employment skills, competencies, and character of education essential for success in the workplace, including issues of diversity, expectations, trends, and labor regulations.**

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14. Describe personal qualities and self-management skills necessary for workplace success such as time management, organization, punctuality, and attendance.
  15. Define effective communication, team-building, and leadership skills.
  16. Describe personal health and workplace safety procedures.
  17. Analyze biases, harassment, and discriminatory behaviors that can affect job success and advancement.
  18. Define procedures that apply to conflict resolution skills.
  19. Explain problem solving and critical thinking skills.
- 

**D. Integrated Learning and Life Skills: Demonstrate how academic knowledge and skills are applied to the workplace, personal life, and life-long learning.**

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20. Describe and use communication, mathematical, and technical skills to solve problems.
  21. Describe the virtual work environment and how employee and supervisor relations would be different.
  22. Examine how factors such as supply and demand, geographic locations, level of education, type of industry, union membership, productivity skill level, and work ethic affect/influence income from employment.
  23. Define methods for goal-setting and achieving clearly-defined goals.
  24. Analyze the ethical issues surrounding access, privacy, and confidentiality of information in emerging technologies.
  25. Develop skills to give and receive constructive feedback.
- 

**E. Economics: Understand economic concepts that influence personal, business, and government decisions.**

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26. Describe how goals, resources, and structures are used within an organization.
27. Describe the concepts of entrepreneurship.
28. Compare and contrast the advantages and disadvantages of the various types of business ownership.
29. Explain economic principles affecting business cycles and the workforce.

## **Family and Consumer Sciences**

# Family and Consumer Sciences

## CONTENT AREA— Early Childhood Education and Services

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Family and Consumer Sciences Skills: Develop a common core of skills related to Family and Consumer Sciences Education.**

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1. Describe the impact of technology on individual and family resources as related to child development, parenting education, and early childhood education and services.
2. Describe the roles of teamwork and leadership skills in the family, workplace, and community.

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**B. Principles of Human Growth and Development: Analyze principles of human growth and development during childhood.**

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3. Analyze physical, emotional, social, moral, and intellectual development.
4. Interpret interrelationships among physical, emotional, social, and intellectual aspects of human growth and development during childhood.

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**C. Factors Affecting Human Growth and Development: Analyze conditions that influence human growth and development during childhood.**

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5. Describe the impact of heredity and environment on human growth and development during childhood.
6. Explain how society's changing economic and technological conditions influence individual growth, including parenting practices of caregivers and family members.
7. Compare the effects of gender, ethnicity, and culture on individual development during childhood.
8. Analyze the effects of life events during childhood on an individual's physical and emotional development.

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**D. Strategies for Promoting Growth and Development: Analyze strengths that promote growth and development during childhood.**

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9. Explain the role of nurturance on the growth and development of children.
10. Explain the role of communication on the growth and development of children.
11. Analyze the role of family and support systems in meeting the growth and development needs of children.

# Family and Consumer Sciences

## CONTENT AREA— Early Childhood Education and Services

### PERFORMANCE STANDARDS AND COMPETENCIES

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**E. Roles and Responsibilities of Parenting: Analyze the roles and responsibilities of parenting.**

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12. Examine parenting roles across the life span.
13. Summarize expectations and responsibilities of the family unit.
14. Identify potential consequences of parenting practices for the individual, family, and society.
15. Assess various societal conditions that impact parenting across the life span.
16. Compare and contrast cultural differences in roles and responsibilities of parenting.

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**F. Parenting Practices: Evaluate parenting practices that maximize human growth and development.**

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17. Describe communication and nurturing strategies that promote positive self-esteem in children.
18. Analyze common practices and emerging research about discipline on human growth and development.
19. Assess the possible impacts of abuse and neglect on children and families and describe methods for prevention.
20. Determine criteria for selecting care and services for children.

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**G. External Support Systems: Evaluate external support systems that provide services for parents.**

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21. Explore community resources that are available to parents and families.
22. Analyze the benefits of community resources and support systems for individuals and families.

# Family and Consumer Sciences

## CONTENT AREA— Early Childhood Education and Services

### PERFORMANCE STANDARDS AND COMPETENCIES

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#### **H. Pre-Parenting Factors: Analyze physical and emotional factors related to beginning the parenting process.**

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23. Identify biological processes related to prenatal development, birth, and health of child, mother, and father.
  24. Distinguish biological and environmental factors that affect the health of the child and parents.
  25. Explain the emotional factors of prenatal development and birth in relation to the health of the parents and child.
  26. Analyze alternatives to biological parenthood.
  27. Identify legal and ethical technological advances from conception to birth.
- 

#### **I. Career Paths: Analyze career paths within early childhood education, childcare services, and related fields.**

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28. Demonstrate interpersonal skills that promote positive and productive relationships with children.
  29. Determine the roles and functions of individuals engaged in early childhood education childcare services, and related fields.
  30. Identify education and training requirements and opportunities for career paths in early childhood education, childcare services, and related fields.
  31. Explore career opportunities in early childhood education, childcare services occupations, and related fields.
  32. Describe and demonstrate effective employability skills.
- 

#### **J. Developmentally Appropriate Practices: Analyze developmentally appropriate practices to plan for early childhood education and childcare services.**

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33. Apply child development theories and assess their implications for educational and childcare practices.
34. Determine a variety of assessment methods to observe and interpret children's growth and development.
35. Identify various cultural and environmental influences when assessing children's development.

# Family and Consumer Sciences

## CONTENT AREA— Early Childhood Education and Services

### PERFORMANCE STANDARDS AND COMPETENCIES

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**K. Integration of Curriculum: Demonstrate integration of curriculum and instruction to meet children’s developmental needs and interests.**

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36. Identify a variety of curriculum and instructional models.
37. Plan and implement learning activities in all curriculum areas that meet the developmental needs and learning styles of children.
38. Develop and demonstrate a variety of teaching methods to meet individual needs of children.
39. Determine and demonstrate methods to establish activities, routines, and transitions.

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**L. Safe and Healthy Learning Environment: Plan a safe and healthy learning environment for children.**

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40. Describe methods to manage physical space, maintaining a safe and healthy learning environment.
41. Describe and implement strategies to teach children health, safety, and sanitation habits.
42. Plan for the nutritional needs of children.
43. Describe the process for recognizing and reporting suspected child abuse and neglect.
44. Identify basic health practices and disease prevention procedures for workers and children regarding childhood illness and communicable diseases.
45. Demonstrate security and emergency procedures.

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**M. Positive Collaborative Relationships: Demonstrate techniques for positive collaborative relationships with children.**

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46. Identify and implement developmentally-appropriate guidelines for behavior.
47. Demonstrate problem-solving methods and skills used with children.
48. Identify and apply interpersonal skills that promote positive and productive relationships with children and families.
49. Determine methods for constructive and supportive interactions with parent/caregiver.

# Family and Consumer Sciences

## CONTENT AREA— Nutrition and Food Production

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Family and Consumer Sciences Skills: Develop a common core of skills related to Family and Consumer Sciences Education.**

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1. Analyze ways in which individuals and families manage resources to meet goals related to food acquisition, and production, and nutrition.
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**B. Nutrition and Wellness Practices: Analyze factors that influence nutrition and wellness practices across the life span.**

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2. Explain the impact of physical, psychological, cultural, spiritual, and social influences on food choices.
  3. Describe the impact of global and local events and conditions on the cost and availability of foods.
- 

**C. Nutritional Needs: Evaluate the nutritional needs of individuals and families in relation to health and wellness across the life span.**

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4. Describe the effect of nutrients on health, appearance, and peak performance.
  5. Explain the relationship of nutrition and wellness to individual and family health throughout the life span addressing the diversity of people, culture, and religions.
  6. Describe the impact of food and diet fads, food addictions, and eating disorders on wellness.
  7. Evaluate sources of food and nutrition information, including food labels, related to health and wellness.
- 

**D. Acquisition, Handling, and Use of Foods: Demonstrate the ability to acquire, handle, and use foods to meet nutrition and wellness needs of individuals and families across the life span.**

---

8. Demonstrate the ability to select, store, prepare, and serve nutritious foods.
9. Describe principles to maximize nutrient retention in prepared foods.
10. Utilize USDA dietary guidelines to select foods that promote a healthy lifestyle.

# Family and Consumer Sciences

## CONTENT AREA— Nutrition and Food Production

### PERFORMANCE STANDARDS AND COMPETENCIES

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**E. Food Safety: Evaluate factors that affect food safety, from production through consumption.**

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11. Determine conditions and practices that promote safe food handling, production, and consumption.
  12. Identify characteristics of major food borne pathogens, their role in causing illness, foods involved in outbreaks, and methods of prevention.
  13. Describe food borne illness as a health issue for individuals and families.
- 

**F. Career Paths: Analyze career paths within hospitality, food production and services, and food science.**

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14. Determine education and training requirements and opportunities for career paths in food production and services.
  15. Identify opportunities for employment.
- 

**G. Safety Issues: Demonstrate procedures applied to safety issues.**

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16. Demonstrate procedures applied to safety issues.
  17. Demonstrate skills in safe handling of knives, tools, and equipment.
  18. Examine procedures for safe and secure storage for equipment and tools.
- 

**H. Food Safety and Sanitation: Demonstrate food safety and sanitation procedures.**

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19. Describe and practice good personal hygiene/health procedures, and report symptoms of illness.
20. Explain and demonstrate methods for properly handling and storing both raw and prepared foods.
21. Explain and demonstrate techniques for food handling and preparation that prevent cross contamination between raw, cooked, and ready-to-eat foods and between animal or fish sources and other food products.
22. Demonstrate procedures for cleaning and sanitizing small equipment, serving dishes, glassware, and utensils.

# Family and Consumer Sciences

## CONTENT AREA— Nutrition and Food Production

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **I. Food Production Equipment: Demonstrate selecting, using, and maintaining food production equipment.**

23. Describe and demonstrate techniques for operating tools and equipment following safety procedures.
24. Describe and demonstrate the process for maintaining tools and equipment following safety procedures.
25. Describe and demonstrate the proper procedures for storing equipment and tools.

#### **J. Planning Menu Items: Demonstrate menu planning based on standardized recipes.**

26. Describe and apply menu planning principles to develop, adjust, and modify recipes and menus.
27. Analyze food, equipment, and supplies needed for menus.

#### **K. Food Preparation: Demonstrate preparation for all menu categories to produce a variety of food products.**

28. Describe and demonstrate a variety of cooking methods such as roasting, baking, broiling, smoking, grilling, sautéing, frying, deep frying, braising, stewing, poaching, steaming, and convection.
29. Describe the fundamentals of time and temperature as they relate to cooking, cooling, and reheating of a variety of foods.
30. Describe and demonstrate the process for preparing various meats and poultry.
31. Describe and demonstrate the process for preparing various stocks, soups, and sauces.
32. Describe and demonstrate the process for preparing various fruits, vegetables, starches, and farinaceous items.
33. Describe and demonstrate the process for preparing various salads, dressings, marinades, and seasonings.
34. Describe and demonstrate the process for preparing baked goods and desserts.
35. Describe and demonstrate the process for preparing, eggs, grains, and batter products.
36. Describe and demonstrate techniques for food presentation.

# Family and Consumer Sciences

## CONTENT AREA— Culinary and Food Production

### PERFORMANCE STANDARDS AND COMPETENCIES

#### **A. Career Paths: Analyze career paths within the food production and food services industries.**

1. Explain the roles, duties, and functions of individuals engaged in food production and service careers.
2. Summarize education and training requirements and opportunities for career paths in food production and services.

#### **B. Food Safety and Sanitation: Demonstrate food safety and sanitation procedures.**

3. Identify characteristics of major food-borne pathogens, their role in causing illness, foods involved in outbreaks, and methods of prevention.
4. Describe food service management safety and sanitation program procedures.
5. Demonstrate good personal hygiene and health procedures and report symptoms of illness.
6. Demonstrate proper purchasing, receiving, storage, and handling of both raw and prepared foods.
7. Demonstrate safe food handling and preparation techniques that prevent cross contamination from potentially hazardous foods, between raw and ready-to-eat foods, and between animal and fish sources and other food products.

#### **C. Food Service Equipment: Demonstrate industry standards in selecting, using, and maintaining food production and food service equipment.**

8. Operate and maintain tools and equipment following safety procedures and OSHA requirements.
9. Demonstrate procedures for cleaning, sanitizing, and storing equipment, tools, serving dishes, glassware, and utensils to meet industry standards and OSHA requirements.
10. Identify a variety of equipment used for food processing, cooking, holding, storing, and serving, including hand tools and small ware.

#### **D. Menu Planning: Demonstrate menu planning principles and techniques based on standardized recipes to meet customer needs.**

11. Apply menu-planning principles to develop and modify menus.
12. Analyze food, equipment, and supplies needed for menus.

# Family and Consumer Sciences

## CONTENT AREA— Culinary and Food Production

### PERFORMANCE STANDARDS AND COMPETENCIES

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**E. Professional food Preparation Methods and Techniques: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.**

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13. Demonstrate professional skills in safe handling of knives, tools, and equipment.
  14. Demonstrate professional skills for a variety of cooking methods including roasting, broiling, smoking, grilling, sautéing, pan frying, deep frying, braising, stewing, poaching, steaming, and baking using professional equipment and current technologies.
  15. Utilize weight and measurement tools to demonstrate knowledge of portion control and proper scaling and measurement techniques.
  16. Apply the fundamentals of time, temperature, and cooking methods to cooking, cooling, reheating, and holding of variety of foods.
  17. Prepare various meats, seafood, and poultry using safe handling and professional preparation techniques.
  18. Prepare various stocks, soups, and sauces using safe handling and professional preparation techniques.
  19. Prepare various fruits, vegetables, starches, legumes, dairy products, fats, and oils using safe handling and professional preparation techniques.
  20. Prepare various salads, dressings, marinades, and seasonings using safe handling and professional preparation techniques.
  21. Prepare sandwiches, canapés, and appetizers using safe handling and professional preparation techniques.
  22. Prepare breads, baked goods, and desserts using safe handling and professional preparation techniques.
  23. Prepare breakfast meats, eggs, cereal grains, and batter products using safe handling and professional preparation techniques.
  24. Demonstrate professional plating, garnishing, and food presentation techniques.
- 

**F. Customer Service: Demonstrate the concept of internal and external customer service.**

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25. Demonstrate quality services that meet industry standards in the food service industry.
26. Analyze the relationship between employees and customer satisfaction.

# Family and Consumer Sciences

## CONTENT AREA— Textiles and Design

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Family and Consumer Sciences Skills: Develop a core of skills related to areas of family and consumer resource management.**

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1. Apply consumer skills to providing and maintaining clothing.
2. Analyze how clothing and textile buying decisions are influenced through media and technology.
3. Demonstrate the management of financial resources and analyze how individuals and families manage resources to meet goals relating to textiles and apparel.

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**B. Fibers and Textiles: Evaluate fibers and textiles.**

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4. Identify, compare, and analyze the most common natural and manufactured textile fibers.
5. Evaluate performance characteristics of commonly used textile fibers and fabrics.
6. Describe and assess effects of textile characteristics on design, construction, care, use, and maintenance of products.
7. Apply appropriate procedures for care of textile products.

---

**C. Apparel and Textile Design: Demonstrate apparel and textile design skills.**

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8. Describe the ways in which the texture and design of a fabric can affect visual appearance.
9. Apply basic and complex color schemes and color theory to develop and enhance visual effects.
10. Utilize elements and principles of design in designing, constructing, and/or altering textile, apparel, and fashion products.
11. Apply elements and principles of design to assist consumers in making decisions.

# Family and Consumer Sciences

## CONTENT AREA— Textiles and Design

### PERFORMANCE STANDARDS AND COMPETENCIES

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**D. Textile and Apparel Products: Demonstrate skills needed to produce, alter, or repair textile and apparel products.**

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12. Explain the purposes and uses of a variety of common equipment, tools, and supplies for apparel and textile construction, alteration, and repair.
  13. Describe and demonstrate basic skills for producing and altering textile products and apparel.
  14. Implement the use of commercial pattern layouts, markings, and symbols.
  15. Implement the use of commercial pattern envelope information to complete a project.
  16. Implement the use of commercial pattern guide sheet instructions to construct a project.
  17. Demonstrate the correct and safe operation of a consumer sewing machine.
- 

**E. Career Paths: Analyze career paths within textile and apparel industries.**

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18. Identify education and training pathways in textile, apparel, and fashion careers.
19. Demonstrate transferable and employability skills used in the community and workplace settings.

# **Marketing Education**

# Marketing Education

## CONTENT AREA— Marketing Education

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Channel Management: Understand the concepts and processes needed to identify, select, monitor, and evaluate sales channels.**

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1. Explain channel management and understand its role in marketing.
  2. Identify ways to create positive relationships with customers to enhance a company's image.
  3. Resolve customer conflicts to encourage repeat business.
  4. Determine ways to reinforce a company's image to exhibit the company's brand promise.
  5. Explain the nature of customer relationship management and how it can contribute to a company.
- 

**B. Marketing-Information Management: Understand the concepts, systems, and tools needed to gather, access, synthesize, evaluate, and disseminate information for use in making business decisions.**

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6. Describe the nature and scope of marketing-information management.
  7. Explain the nature and scope of marketing-research activities.
  8. Explain marketing-research design considerations and evaluate their appropriateness for researching problems and issues.
  9. Describe data-collection methods and evaluate their appropriateness for researching problems and issues.
  10. Use marketing information to plan marketing activities.
- 

**C. Marketing: Understand the processes and set of institutions for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large.**

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11. Describe marketing's role and function in business to facilitate economic exchanges with customers.
12. Describe customer, client, and business behavior and how it motivates decision-making.
13. Develop marketing strategies to guide marketing tactics.
14. Select the appropriate target market for a product and business to obtain the best return on marketing investment (ROMI).
15. Use marketing information to develop a marketing plan.
16. Explain the role of pricing in marketing.

# Marketing Education

## CONTENT AREA— Marketing Education

### PERFORMANCE STANDARDS AND COMPETENCIES

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**D. Product/Service Management: Understand the concepts and processes needed to obtain, develop, maintain, and improve a product or service mix in response to market opportunities.**

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17. Explain the nature and scope of product and service management.
  18. Apply quality assurances to enhance product and service offerings.
  19. Explain how product-mix strategies can help meet customer expectations.
  20. Identify ways products and services can be positioned to acquire a desired business image.
- 

**E. Promotion: Understand the concepts and strategies needed to communicate information about products, services, images, and/or ideas to achieve a desired outcome.**

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21. Explain the nature and scope of promotion.
  22. Identify promotional channels used to communicate with targeted audiences.
  23. Explain the use of an advertisement's components to communicate with targeted audiences.
  24. Describe the use of public-relations activities to communicate with targeted audiences.
- 

**F. Selling: Understand the concepts and sequences of addressing the needs of a market, leading to the movement of a product or service from producer to consumer.**

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25. Explain the nature and scope of selling.
26. Acquire product knowledge to communicate product benefits and to ensure appropriateness of product for the client or customer.
27. Explain sales processes and techniques to enhance customer relationships and to increase the likelihood of making sales.
28. Identify pre-sales activities to facilitate a sales presentation.

## **Medical Careers Education**

# Medical Careers Education

## CONTENT AREA— Medical Careers Education

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Health Science: Understand and apply the academic subject matter required for entrance into health science.**

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1. Differentiate among and prepare various patient forms, including HER and EMR that are used in documenting client/patient information.
  2. Perform mathematical operations as they relate to healthcare procedures.
  3. Interpret healthcare results using diagrams, charts, graphs, and tables.
  4. Define and use the following medical terminology: root words, prefixes, suffixes, and abbreviations.
  5. Describe the basic structural and functional organization of the human body used in assessing health.
  6. Describe healthcare in respect to diverse populations.
- 

**B. Disease Processes: Demonstrate the concepts of basic disease processes.**

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7. Research common and emerging diseases and disorders.
  8. Recognize signs and symptoms of common and emerging diseases and disorders.
  9. Identify the body's response to the presence of disease or infection.
- 

**C. Body Systems: Compare the anatomical structures and physiological function of each body system.**

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10. Diagram the structure of cells, tissues, organs, and systems.
  11. Identify physiology and pathophysiology of body systems.
  12. Define and use the following medical terminology related to each body system: root words, prefixes, suffixes, and abbreviations.
- 

**D. Health Care Delivery System: Describe how the health care workers' role fits into their department, organization, and overall health care environment.**

---

13. Differentiate among the range of services offered to clients through various health care facilities.
14. Compare how various state and federal agencies, regulatory boards, and insurance companies affect the delivery of health care, including reimbursement and payment sources.
15. Describe consumer's responsibility within the healthcare delivery system.

## Medical Careers Education

### CONTENT AREA— Medical Careers Education

#### PERFORMANCE STANDARDS AND COMPETENCIES

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**E. Employability Skills: Analyze how employability skills enhance employment opportunities and job satisfaction.**

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16. Demonstrate proficiency in technology skills.
  17. Compare various career options in therapeutic and diagnostic health care clusters and the required education for practice.
  18. Describe the personal and professional attributes of a healthcare provider.
  19. Demonstrate employability skills in healthcare.
- 

**F. Legal Awareness: Evaluate legal responsibilities, limitations, and implications of actions within the health care delivery system and perform duties according to regulations, policies, laws, and rights of clients.**

---

20. Explain the following legal aspects of client/patient care: confidentiality of health information (HIPAA), consent, and negligence.
  21. Explain and apply the Patient's Bill of Rights in maintaining confidentiality and quality health care.
  22. Define scope of practice.
  23. Describe legal requirements in documentation.
  24. Incorporate procedures for accurate documentation in the healthcare setting.
  25. Describe legal issues and directives in healthcare such as advanced directives, informed consent, living will, negligence, and malpractice.
  26. Describe the legal responsibility related to abuse and neglect.
- 

**G. Ethical Practices: Evaluate accepted ethical practices with respect to cultural, social, and ethnic differences within the health care environment.**

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27. Identify the needs of clients/patients who have cultural, social, ethical, and spiritual differences.
28. Interpret a Code of Ethics and the Patient's Bill of Rights.
29. Demonstrate respectful and empathetic treatment of ALL patients/clients.
30. Utilize procedures for reporting activities and behaviors that affect the health, safety, and welfare of others.

# Medical Careers Education

## CONTENT AREA— Medical Careers Education

### PERFORMANCE STANDARDS AND COMPETENCIES

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#### **H. Safe and Healthy Work Practices: Analyze the existing and potential hazards to clients, co-workers, and self and prevent injury or illness through safe work practices and follow health and safety policies and procedures.**

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31. Describe standard precautions and OSHA standards to control the spread of infection.
  32. Apply principles of body mechanics.
  33. Identify methods for cleaning instruments, equipment, and environmental surfaces.
  34. Identify and implement emergency procedures for fire, electrical hazards, and hazardous materials.
  35. Recognize and comply with safety signs, symbols, labels, and the use of SDS sheets.
- 

#### **I. Individual and Team Responsibilities: Understand the role and responsibilities of individual members as part of the healthcare team, including the ability to promote the delivery of quality health care and interact effectively and sensitively with all members of the health care team.**

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36. Describe interdisciplinary roles and responsibilities of the healthcare team.
  37. Recognize characteristics of an effective healthcare team.
  38. Identify the various levels in the healthcare team chain of command.
  39. Explain the process for managing conflict within the workplace.
- 

#### **J. Health Maintenance Practices: Understand the fundamentals of wellness and the prevention of disease processes.**

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40. Identify available preventive health screenings and examinations.
  41. Describe alternative health practices.
  42. Describe behaviors that promote health and wellness.
  43. Identify methods to reduce health risk factors.
- 

#### **K. Pathophysiology: Analyze pathophysiological effects of abnormal factors that impact a healthy body and mind.**

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44. Explain the effects of immobility on the body systems.
45. Interpret the potential effects of stress on the development of disease.
46. Describe the effects of potential complications associated with the abuse of alcohol, tobacco, and prescription drugs.
47. Compare various diseases caused by environmental hazards, including temperature-related disorders, bites, stings, and food poisoning.

# Medical Careers Education

## CONTENT AREA— Medical Careers Education

### PERFORMANCE STANDARDS AND COMPETENCIES

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**L. Patient Communication: Demonstrate patient interaction skills.**

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48. Describe the elements of communication using a basic sender-receiver-feedback model.
49. Differentiate communication to meet the needs of the patient.
50. Use verbal and non-verbal communication skills.
51. Describe communication barriers.
52. Gather and report subjective and objective data utilizing active listening/speaking and writing skills.

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**M. Team Communication: Understand how to communicate client information within a team.**

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53. Provide complete client information to the team within a timely manner.
54. Observe and report unsafe environmental conditions.
55. Report changes in patient conditions during any patient interaction.
56. Document and report changes in conditions that might introduce risk to clients or staff.

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**N. Monitoring Patient Status: Monitor, plan, implement, and evaluate the care provided based on age, physical, and psychosocial needs.**

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57. Demonstrate the following skills: vital signs, basic CPR/AED principles, basic first aid, basic client transfers, height/weight, and appropriate medical language.
58. Recognize and report subjective and objective findings to nurse.

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**O. Principles of Body Mechanics: Understand the principles of body mechanics for positioning, transferring, and transporting clients and perform these activities efficiently and without injury to clients or self.**

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59. Describe and demonstrate the process for positioning the client to ensure comfort.
60. Recognize center of gravity and base of support in order to use proper lifting techniques.
61. Describe and use various types of transport or transfer equipment appropriate for the patient/situation.
62. Inform patients/clients of what to expect during activity.

# **Technology Education**

# Technology Education

## CONTENT AREA— Automotive Technology

### PERFORMANCE STANDARDS AND COMPETENCIES

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#### **A. Customer Relations and Shop Procedures: Explain the basic processes and procedures for maintaining a clean, safe, and customer-friendly shop.**

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1. Interpret repair and work orders, including differentiating between parts and labor costs.
  2. Differentiate between flat rate labor and hourly labor.
  3. Explain what is included in an automobile maintenance schedule.
- 

#### **B. Shop Safety Procedures: Identify and describe basic shop safety practices, including personal, shop, and hazardous materials.**

---

4. Demonstrate knowledge of proper use, storage, and disposal of hazardous materials for an automotive facility according to OSHA regulations.
  5. Demonstrate and explain knowledge of personal safety practices such as eyewear, clothing, footwear, and personal protective equipment (PPE).
  6. Demonstrate and explain knowledge of shop safety procedures when performing tasks, such as raising a vehicle with a floor jack.
  7. Identify basic hand tools and their usage in the automotive industry.
- 

#### **C. Engine Repair: Describe the various processes used to perform engine repair.**

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8. Describe basic valve train operation and configuration, such as DOHC, SOHC, OHV, and flathead.
9. Describe basic engine cylinder configurations such as V, inline, and horizontally opposed.
10. Identify and describe the function of the basic engine components.
11. Differentiate between the 4-stroke and 2-stroke operating cycles.
12. Differentiate between spark ignition and compression ignition engines.
13. Describe the purpose, operation, and basic components of lubrication systems.
14. Describe the purpose, operation, and basic components of engine cooling systems.
15. Describe the purpose, operation, and basic components of exhaust and exhaust emissions systems.

# Technology Education

## CONTENT AREA— Automotive Technology

### PERFORMANCE STANDARDS AND COMPETENCIES

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**D. Electrical/Electronic Systems: Identify and describe the various components of electrical/electronic systems.**

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16. Explain the process for performing battery diagnosis and service.
  17. Describe the purpose, operation, and components of basic starting systems.
  18. Describe the purpose, operation, and components of basic charging systems.
  19. Describe the purpose, operation, and components of basic lighting systems.
  20. Differentiate between series and parallel circuits.
  21. Define volts, amperes, and resistance.
  22. Perform simple calculations for volts, amperes, and resistance using Ohm's Law.
- 

**E. Engine Performance: Describe the components and functions of the various systems related to engine performance.**

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23. Describe the purpose, operation, and basic components of the ignition system.
  24. Describe the purpose, operation, and basic components of fuel and air induction systems.
  25. Identify the differences between carburetion and fuel injection.
  26. Describe the purpose, operation, and basic components of evaporative emission control systems.
  27. Explain the use of a computer scanner to read Diagnostic Trouble Codes (DTC).
- 

**F. Suspension and Steering: Identify and describe the function of the components of suspension and steering systems.**

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28. Describe the purpose, operation, and basic components of the steering system.
  29. Describe the purpose, operation, and basic components of the suspension system.
  30. Explain caster, camber, and toe-in wheel alignment angles.
  31. Identify factors that cause abnormal tire wear.
- 

**G. Brakes: Identify and describe the major components of various types of braking systems.**

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32. Explain hydraulic systems as they pertain to the service braking systems.
33. Describe the purpose, operation, and basic components of drum brakes.
34. Describe the purpose, operation, and basic components of disc brakes.
35. Describe the purpose, operation, and basic components of parking brake systems.
36. Describe the purpose, operation, and basic components of anti-lock braking systems (ABS) and traction control systems (TCS).

# Technology Education

## CONTENT AREA— Computer Aided Drafting and Design

### PERFORMANCE STANDARDS AND COMPETENCIES

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#### **A. Materials and Processes: Identify and describe the basic elements used in computer aided drafting and design.**

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1. Describe objects as geometric entities.
  2. Describe and demonstrate the process of using a mechanical or electronic caliper accurately as required by the design intent.
  3. Describe and demonstrate the use of graphic communication skills through sketching.
  4. Send and access information through a network.
  5. Express a design of an object as a 3D model.
  6. Export and import images/files in a variety of file formats.
  7. Evaluate the choice and placement of dimensions, notes, and annotations to clearly communicate design intent.
  8. Revise a design and update finished drawings appropriately.
  9. Identify the following basic geometric elements: line, circle, rectangle, sphere, and cube.
  10. Describe and apply the following basic geometric concepts to building 3D models: tangent and parallel concentric.
- 

#### **B. Identifying Hardware and Operating Systems: Identify and describe the basic hardware and operating systems used in computer aided drafting and design.**

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11. Identify and describe various types of hardware and software.
  12. Identify and describe the purpose of operating system components.
  13. Define and apply computer terminology.
- 

#### **C. Using Hardware and Operating Systems: Describe the process of utilizing various hardware and operating systems.**

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14. View file names on a storage device.
15. Store, copy, move, and retrieve information to/from various drives.
16. Rename and backup files.

# Technology Education

## CONTENT AREA— Computer Aided Drafting and Design

### PERFORMANCE STANDARDS AND COMPETENCIES

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#### **D. Interpreting and Reading Blueprints: Identify various symbols to interpret and read blueprints.**

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17. Interpret basic views and dimensions in a working drawing.
  18. Identify geometric tolerance symbols.
  19. Interpret drawings, pictures, and symbols.
- 

#### **E. Creating and Manipulating Mechanical Drawing Information: Describe and demonstrate the process for creating various types of views using a well-organized process.**

---

20. Explain the Cartesian Coordinate System.
  21. Describe the process for setting and editing drawing elements.
  22. Create and edit line types, colors, and layers/levels.
  23. Create and edit basic geometry.
  24. Place and edit text and fonts.
  25. Create orthographic, isometric, section, and auxiliary views.
  26. Place and edit dimensions.
  27. Generate a 2-D multiview drawing.
  28. Generate a pictorial drawing.
  29. Scale and print a hard copy to an output device.
  30. Explain the use and need for scaled drawings.
- 

#### **F. Drawing and Designing Assemblies: Create assemblies and views in 3-D format.**

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31. Create an assembly in 3-D geometry.
  32. Create an exploded view of a 3-D assembly.
- 

#### **G. Using a 3-D Model: Describe and demonstrate the process for converting 2-D drawings to a 3-D format.**

---

33. Create and edit construction planes through reference geometry.
34. Create a 2-D drawing from a 3-D model.
35. Create a 3-D model from a 2-D drawing.

# Technology Education

## CONTENT AREA— Engineering Technology

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Career Awareness: Identify and describe various careers in the engineering field, including educational requirements and ethical expectations.**

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1. Describe the following engineering fields: mechanical, chemical, civil, and electrical.
2. Identify the following job functions and responsibilities: research and development, design, production, supervision, management, testing, and analysis in mechanical, chemical, civil, and electrical engineering.
3. Identify the following educational requirements in engineering: associate, bachelor, master, and doctorate degrees.
4. Describe ethics related to engineering in the following situations: environmental, sustainable engineering, and corrupt practices.

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**B. Safety: Describe and apply safe practices in the lab environment.**

---

5. Explain and demonstrate the proper use of personal protective equipment (PPE).
6. Describe and demonstrate the proper use of engineering laboratory equipment.

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**C. Teamwork: Explain the characteristics of an effective engineering design team.**

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7. Identify the roles and responsibilities of the following engineering design team members: team leader, designers, reporters, testers, and fabricators.
8. Identify the following characteristics of an effective design team: team norms, leadership, responsibility, respect, rapport, and time management.

---

**D. Materials: Describe the process for selecting the appropriate materials based on product function.**

---

9. Describe the following mechanical properties of steel, concrete, wood, and plastic: ductility/brittleness, tension, shear, and compression.
10. Explain the process used for selecting the correct materials for specific functions.
11. Test materials for specific characteristics.

# Technology Education

## CONTENT AREA— Engineering Technology

### PERFORMANCE STANDARDS AND COMPETENCIES

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**E. Production Process: Describe the various material processes and equipment used in quality control.**

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12. Explain the following quality controls: geometric dimensioning and tolerances, and go-no go gauge.
  13. Use the following measurement tools and instruments: rulers, micrometers, and vernier calipers.
  14. Identify the following elementary statistical process controls: distribution curves, normal curves, and skew curves.
- 

**F. Software: Identify and demonstrate the use of various digital resources used in the engineering field.**

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15. Identify available digital resources for researching problem solutions.
  16. Use word processing software to develop reports.
  17. Use presentation software to develop oral presentation of findings.
  18. Describe and demonstrate the process for using CAD in a design solution.
  19. Use spreadsheet software to develop tables, graphs, charts, and to track data.
- 

**G. Engineering Principles: Identify and describe the various systems that are part of the engineering field, including static, mechanical, electricity, fluid power, and thermal principles.**

---

20. Describe and apply the following statics principles: vectoring to predict resultant forces, equilibrium, trusses, and moment of inertia.
21. Describe and apply the following mechanical systems principles: Law of Conservation of Energy, six simple machines, mechanical advantage, efficiency, work, rate, and friction/resistance.
22. Describe and apply the following electricity principles: Ohm's, Watt's, series, parallel, combination circuits, AC/DC systems, and conductors/insulators.
23. Describe the following components and applications of fluid power principles: reservoir, fluid conductors, valves, pumps, actuators, Pascal's Law, and Bernoulli's Principle.
24. Describe the following principles and applications of thermodynamics: heat flow and transfer, convection, conduction, radiation, temperature scales, and conductors/insulators.

# Technology Education

## CONTENT AREA— Engineering Technology

### PERFORMANCE STANDARDS AND COMPETENCIES

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#### **H. Design Process: Describe and apply the design process to identify and solve a problem.**

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25. Identify the components of the design process: define the problem, brainstorm, research, develop solutions, prototype, test/evaluate, and communicate results.
26. Identify the elements of a well-written problem statement.
27. Describe the process of brainstorming.
28. Describe the process for researching relevant information.
29. Describe the process of developing a solution.
30. Build a prototype from working drawings using appropriate materials.
31. Test prototype to defined criteria.
32. Use a variety of productivity software to explain the results of the design process, including, spreadsheets, word processing, data analysis, and presentations.

# Technology Education

## CONTENT AREA— Digital Video Production Systems

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Video Production Skills: Understand video production as a communication tool and the equipment and skills required to properly communicate a message.**

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1. Describe the various video production processes, when integrated together to create a successful message.
  2. Describe the differences between a studio production and a field production.
  3. Identify various career paths in digital/video production.
- 

**B. Safety: Describe and apply the fundamental principles that relate to both field and studio production.**

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4. Demonstrate fire safety prevention and extinction, and trip hazards as it relates to lighting and electrical equipment.
  5. Describe the fundamentals of step ladder safety.
  6. Identify proper methods of transport and storage for appropriate production and personal equipment.
  7. Describe and apply fundamentals of cable safety.
- 

**C. Pre-Production: Describe the process used for concept development and storyboarding as part of the pre-production process while focusing on the importance of communication, deadlines, and legal considerations.**

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8. Identify a target audience and design an appropriate message for the target market.
9. Describe the process used for concept development/treatment.
10. Identify and describe the script elements of storyboarding, two column, and screenplay format.
11. Define and describe the legal concerns of copyrights, ethics, releases, and royalties.
12. Explain the importance of budgets, scheduling, and deadlines in meeting the requirements of a project.
13. Evaluate a shooting location in terms of lighting, sound, production equipment needs, and electrical essentials.

# Technology Education

## CONTENT AREA— Digital Video Production Systems

### PERFORMANCE STANDARDS AND COMPETENCIES

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#### **D. Production: Identify and describe the elements of production to effectively deliver a message.**

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14. Describe, plan the use of, and apply 3-point lighting, source light, white balance, scrims, and reflectors using the appropriate techniques.
  15. Describe the various types of sound equipment and techniques used with handheld, lavalier, shot gun, condenser, omni and directional methods.
  16. Describe the equipment and personnel necessary for producing a studio production.
  17. Describe the equipment and personnel necessary for producing a field production.
- 

#### **E. Cinematic Principles: Describe and apply fundamental camera operations, movement, and composition.**

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18. Describe white balance, iris, aperture, auto and manual focus, audio settings, and levels in camera operations.
  19. Describe dolly, truck, pan, and tilt as it relates to camera movements.
  20. Describe the following methods of stabilization: tripod, monopod, slider, steady cam, fluid head, friction head, and dolly.
  21. Describe the rule of thirds, head room, lead room/talk space, establishing shot, extreme close up, close up, medium, medium wide, wide, extreme wide, and depth of field as it relates to camera composition/framing.
- 

#### **F. Post-Production: Identify and describe the elements of post-production to effectively deliver a message.**

---

22. Create graphics and titles appropriate to the project.
  23. Describe play head, timeline, bin, multiple tracks, trimming, and edit points within nonlinear video editing.
  24. Describe and apply import, file, and asset management.
  25. Edit and finalize images and video for rough cut, transitions, color correction, keying, and pacing with nonlinear software.
  26. Edit audio for voice over, sound levels, music, and sound effects with application software.
- 

#### **G. Media Components and Concepts: Identify and understand the technological literacy of video production.**

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27. Describe the following digital literacy terminology: aspect ratios, screen resolution, frame rate, file formats, codec, compression, bit rate, and display properties.

# Technology Education

## CONTENT AREA— Wood Technology

### PERFORMANCE STANDARDS AND COMPETENCIES

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**A. Safety: Describe and demonstrate the procedures related to workplace and job-site safety, including personal protective equipment, machine safety, and material handling practices.**

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1. Demonstrate knowledge of proper use, storage, and disposal of hazardous materials following OSHA's proper safety practices for a woodworking facility.
  2. Demonstrate and explain knowledge of workplace safety procedures.
  3. Demonstrate and explain knowledge of personal safety practices pertaining to eye wear, footwear, clothing, and personal protective equipment (PPE) used in wood technology.
  4. Describe safety practices for the following machines: table saw, drill press, stationary sander, router table, and miter saw.
  5. Demonstrate and explain knowledge of proper use and storage of basic hand tools.
  6. Demonstrate and explain knowledge of proper use and storage of portable power tools.
  7. Explain safe proper use, disposal, and storage of chemicals following OSHA standards.
- 

**B. Machines and Tools: Identify and describe the function of various types of layout hand and power tools in the Wood Technology field.**

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8. Identify, use, and maintain the following measuring, layout, and marking tools: steel rule, tape measure, combination square, sliding "T" bevel, and compass.
9. Identify proper use and function of the following portable power tools: circular saw, drill, jig/saber saw, finishing sanders, and routers.
10. Identify proper use and function of the following fastening tools: hammer, phillip head screw driver, and slotted/flat head screw driver.
11. Identify proper use and function of the following hand tools: cross cut saw, rip saw, level, coping saw, nail set, hand plane, chisel, and file.
12. Identify proper use and function of the table and miter saws.

# Technology Education

## CONTENT AREA— Wood Technology

### PERFORMANCE STANDARDS AND COMPETENCIES

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**C. Design, Measurement, and Layout: Interpret technical drawings, rough drawings and sketches, and the use fractional measurement.**

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13. Describe and identify fractional measurements from a basic plan and assembly drawings.
14. Describe and prepare rough drawings and sketches.
15. Explain and prepare a cut list or bill of material from a basic plan and assembly drawing.
16. Measure accurately to a sixteenth of an inch.
17. Identify the difference between both nominal and actual dimensions.
18. Estimate material quantities in both board feet and linear feet.
19. Consider the natural characteristics of grain, knots, and checks when laying out a board.

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**D. Materials: Describe characteristics and appropriate applications for softwoods, hardwoods, and plywoods.**

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20. Identify characteristics and applications of the following coniferous softwoods: pine, cedar, and fir.
21. Identify characteristics and applications of the following deciduous hardwoods: oak, maple, and poplar.
22. Identify characteristics and applications of the following engineered lumber: plywood and medium density fiberboard.

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**E. Material Processing: Identify and describe the various types of processes associated with the woodworking field and the characteristics of wood as a medium.**

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23. Identify and select the proper cutting process based on grain direction.
24. Identify how grain direction affects a material's strength.
25. Understanding kerf and its application to cutting and layout operations.

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**F. Abrasives: Describe the various types of abrasive materials used in wood technology.**

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26. Describe the abrasive grit numbering grading system.

# Technology Education

## CONTENT AREA— Wood Technology

### PERFORMANCE STANDARDS AND COMPETENCIES

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**G. Jointery: Identify various types of joints and describe the process for preparation and assembly.**

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27. Identify and assemble the following types of joints: butt, miter, dado, rabbet, and lap.
  28. Prepare stock for use.
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**H. Assembly: Identify and describe the purpose of various types of fasteners, adhesives, and clamping devices.**

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29. Identify and describe the purpose and use of the following woodworking fasteners: common nails, round head screws, flat head screws, and oval head screws.
  30. Identify and describe the purpose of the following clamping devices: bar clamp, c-clamp, parallel/hand screw clamp, and spring clamps.
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**I. Finishing: Describe various types of available finishes and safety precautions used during the application process.**

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31. Identify and apply various wood finishes for interior and exterior, with brush or wipe on, for the following: paint, stain, and clear coat.