

CONNECTICUT STATE DEPARTMENT OF EDUCATION



Agricultural Science and Technology Education Standards

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Bureau of Teaching and Learning
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Hartford, CT 06106**

Agriculture is a highly technical and ever-changing industry upon which everyone is dependent. Agricultural Science and Technology Education programs are designed to instill in students the importance of the different agrisciences, of marketing strategies, of safe food production and the need for continuous research to improve agriculture. Strong, relevant, rigorous agriscience programs are necessary to make students career and college ready in the field of agriculture.

The Connecticut Agriscience and Technology Education Standards were developed to provide state agricultural education teachers with a forward-thinking guide for what students should know and be able to do through the study of agriculture in grades 9 through 14.

The Connecticut Agriscience and Technology Education Standards should be used as a guide to develop well-planned curriculum in agriscience education to be delivered to students throughout the state. Just as agriculture varies throughout our state, so will our agricultural education programs. Local Education Agencies (LEA) should use these standards in conjunction with local advisory committees to determine what is most relevant and appropriate for their students in providing that all-important link between the school and the agriculture community. The standards, performance elements, performance indicators and measurements should be used by educators to guide agricultural education curriculum development at the local level.

The *Connecticut Agricultural Science and Technology Education Standards* provides teachers with knowledge that will allow them to design and conduct curriculum which engages students in agriculture instruction that integrates academic and technical preparation and focuses on college and career readiness.

The *Connecticut Agricultural Science and Technology Education Standards* are organized as follows:

Agriculture, Food and Natural Resources Foundation Skills (CT-FS)—foundational to study in any of the five pathways. They involve underlying concepts needed for success regardless of the pathway pursued. The standards cover such fundamental concepts as safety, marketing, information-based technologies, first aid, and team work.

Leadership Skills (CT-LS)- foundational to study in any of the five pathways. They involve underlying concepts needed for success regardless of the pathway pursued. These skills are sometimes referred as the soft skills, public speaking, professional organization, personal development and growth, social interactions, career success, thinking, reasoning and writing skills.

Beyond the coverage of these foundational skills, the pathway content standards are further organized into five pathways of study. The pathway content standards cover technical content required for future success within each respective pathway.

The five pathways in the *Connecticut Agricultural Science and Technology Education Standards* are:

Animal Systems (CT-AS)—the study of animal systems, including life processes, health, nutrition, genetics, management and processing, through the study of small animals, livestock, dairy, horses and/or poultry

Aquaculture (CT-AQ)—the study of aquatic organisms, including life processes, health, culture, management and processing including both fresh and salt water species. Marine technology skills and knowledge will be explored and studied.

Natural Resource Systems (CT-NRS)—the study of the management of soil, water, wildlife, forests and air as natural resources

Plant Systems (CT-PS)—the study of plant life cycles, classifications, functions, structures, reproduction, media and nutrients, as well as growth and cultural practices, through the study of crops, turf grass, trees and shrubs and/or ornamental plants

Power, Structural and Technical Systems (CT-PST)—the study of agricultural equipment, power systems, alternative fuel sources and precision technology, as well as woodworking, metalworking, welding and project planning for agricultural structures

Within each pathway, the standards are organized as follows:

Pathway Content Standard—This is a general statement indicating the broad area of knowledge covered in each pathway.

Performance Elements—These represent the major topical areas within each pathway. Generally, each pathway has 4 to 13 Performance Elements.

Performance Indicators—These are more precise statements that serve as an indication of the knowledge/ability the student should possess.

Measurements—These are sample measurable activities that students might carry out to indicate attainment of each Performance Indicator. The measurements are broken into three levels as follows:

– Level I—These are fundamental activities/abilities students possess at roughly the 9th- and 10th-grade levels upon which all other activities are built.

– Level II—These are activities/abilities that will build on the first-level knowledge and are skills that students possess at roughly the 11th- and 12th-grade levels.

– Level III—These are activities/abilities that will build in complexity from the first two levels and are skills students possess at roughly the 13th- and 14th-grade levels. These skills may be obtained at the end of the high school level in more focused programs, in which case articulation agreements with postsecondary institutions are encouraged.

The development of the *Connecticut Agricultural Science and Technology Education Standards* began with a review of the National Agriculture, Food, and Natural Resources (AFNR) Career Cluster Content Standards originally developed in 2009. The Committee began with these because the statements had been reviewed by hundreds of educators and industry representatives as they were developed. The comments of these reviewers guided the work in the development of the accompanying standards.

Throughout the process, the *Connecticut Agricultural Science and Technology Education Standards* Committee stressed rigor and relevance both in the agricultural content covered and in the alignment of the *Connecticut Agricultural Science and Technology Education Standards* to national academic standards. Thus, the accompanying document includes not only the *Connecticut Agricultural Science and Technology Education Standards* but also the alignment of the Performance Indicators to national academic standards. Further, these academic standards are fully stated in the Appendix that accompanies the *Connecticut Agricultural Science and Technology Education Standards*.

Alignment with *The Connecticut Career Assessment Standards in Animal Science, Agriculture Mechanics, Aquaculture, Plant Science and Natural Resources* was conducted the assessment standards are written in italics and identified with an asterisk.

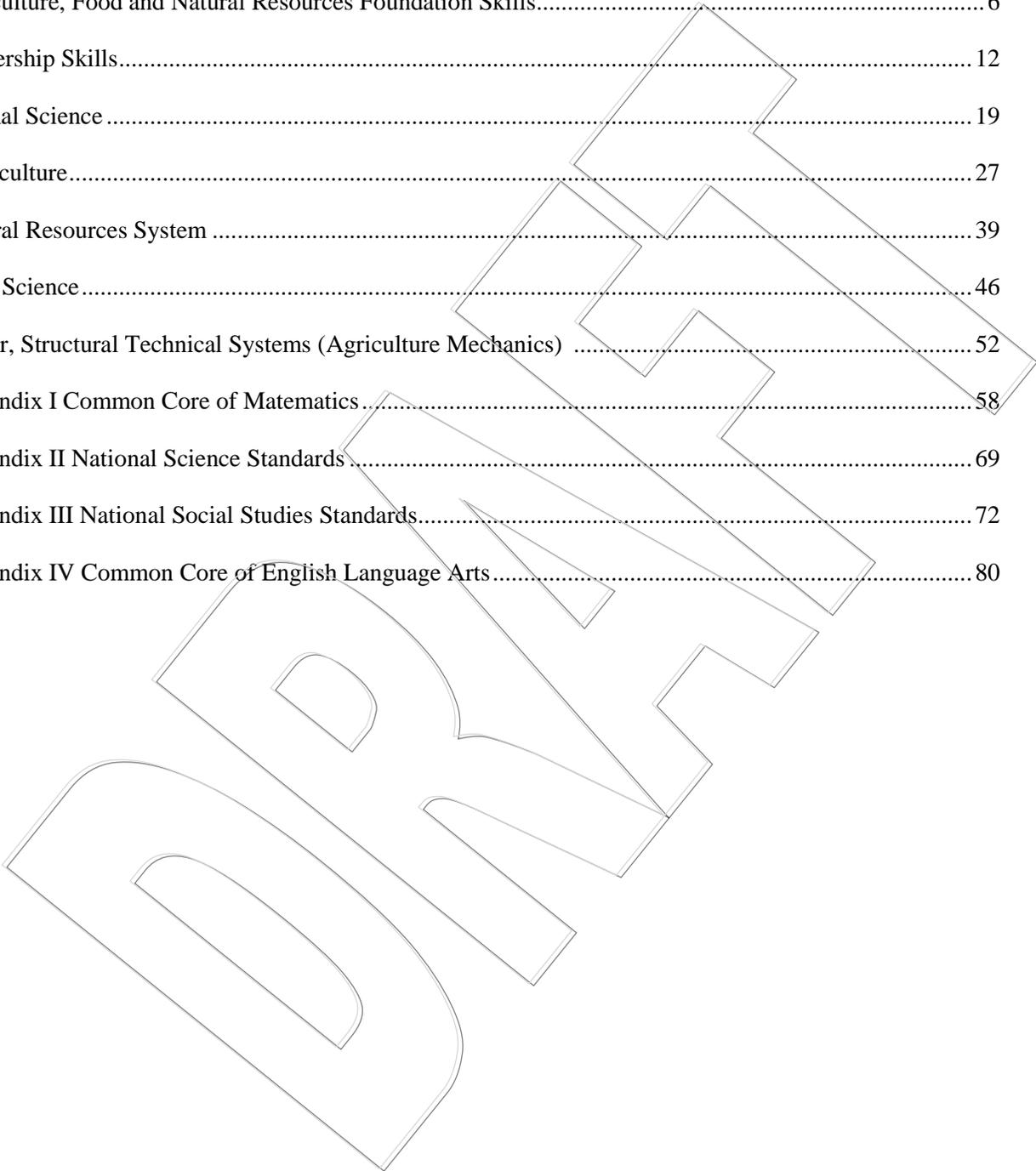
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Agriculture, Food and Natural Resources Foundation Skills

Pathway Content Standard: The student will demonstrate competence in the application of scientific principles and practices to all areas of agriculture.

Level 1	Level 2	Level 3	National Academic Standard
CT-FS.01. Performance Element: Handle contaminants and equipment safely.			
CT-FS.01.01. Performance Indicator: Safety with Contaminants and Equipment: Understand the concepts and procedures of handling contaminants, chemicals and related equipment in an agricultural setting.			
CT-FS.01.01.01.a. Interpret labels. (B13; B18 Aquaculture).*	CT-FS.01.01.01.b. Read and interpret Material Safety Data Sheets (MSDS) (B14; B19 Aquaculture).*		
CT-FS.01.01.02.a. Understand safety precautions used when handling, measuring, mixing, disposing and cleaning of chemicals and related equipment (B15; B20 Aquaculture).*	CT-FS.01.01.02.b. Explain proper use of safety equipment in agriculture (B16; B21 Aquaculture).*		
CT-FS.01.01.03.a. Understand environmental protection laws and policy (B17; B22 Aquaculture).*			
CT-FS.02. Performance Element: Demonstrate ability to access information-based technologies.			
CT-FS.02.01. Performance Indicator: Understand the use and application of information-based technologies necessary for career success in agriculture.			
CT-FS.02.01.01.a. Describe basic computer and software systems as they apply to agriculture (C18; C23 Aquaculture).*	CT-FS.02.01.01.b. Use career multimedia technology and software as it relates to agriculture (C19; C24 Aquaculture).*		
CT-FS.03. Performance Element: Understand the marketing of agriculture/aquaculture products and services.			
CT-FS.03.01. Performance Indicator: Understand the sequence of the channels of distribution and marketing including their impact on the agriculture industry.			
CT-FS.03.01.01.a. Understand supply and demand principles in Agriculture, Food, and Natural Resource systems. (D20; D25 Aquaculture).*	CT-FS.03.01.01.b. Identify strategies frequently employed in agricultural marketing programs. (D21; D26 Aquaculture).*		
CT-FS.03.01.02.a. Define the concept of profit and loss in agricultural business. (D22; D27 Aquaculture).*	CT-FS.03.01.02.b. Understand the impact of advertising media on agriculture (D23; D28 Aquaculture).*		
CT-FS.03.01.03.a. Explain the impact of positive customer/client relations (D24; D29 Aquaculture).*			

CT-FS.04. Performance Element: Examine the importance of health, safety, and environmental management systems in organizations and their importance to performance and regulatory compliance.			
CT-FS.04.01. Performance Indicator: Observe required regulations to maintain/improve safety, health and environmental management systems.			Science: F4 and F5 Social Studies: 3g
CT-FS.04.01.01.a. Examine major health, safety, and environmental management system components in AFNR organizations.	CT-FS.04.01.01.b. Identify the benefits of improved health, safety, and environmental performance to AFNR organizations in current geographical area.	CT-FS.04.01.01.c. Assess how AFNR organizations promote improved health, safety, and environmental performance and suggest plans for improvement.	
CT-FS.04.02. Performance Indicator: Develop a plan to maintain and improve health, safety and environmental compliance and performance.			Science: F1, F4 & F5 Social Studies: 9d
CT-FS.04.02.01.a. Use proper safety practices/personal protective equipment.	CT-FS.04.02.01.b. Develop plans to improve health, safety and environmental performance.	CT-FS.04.02.01.c. Educate other workers to improve health, safety, and environmental performance in a safe manner.	
CT-FS.04.03 Performance Indicator: Provide health, safety, and environmental operating guidelines.			Science: F4 and F5 Language Arts: 4 and 5
CT-FS.04.03.01.a. Demonstrate the importance of safety, health, and environmental practices in the workplace.	CT-FS.04.03.01.b. Develop a pollution/waste prevention plan to enhance safety, health, and environmental practices in the workplace.	CT-FS.04.03.01.c. Establish a set of health, safety, and environmental principles to ensure a high level of performance.	
CT-FS.04.04. Performance Indicator: Examine health risks associated with a particular skill to better develop personnel safety guidelines.			Science: F1 and F5
CT-FS.04.04.01.a. Determine the level of contamination or injury that would be considered a risk as associated with a specific job or activity.	CT-FS.04.04.01.b. Assess the safety priorities for the level of contamination or injury.	CT-FS.04.04.01.c. Implement a plan to mitigate the level of contamination or injury identified in the workplace.	
CT-FS.05. Performance Element: Safety, Health, and Environmental: Demonstrate appropriate health and safety procedures for AFNR occupations.			
CT-FS.05.01. Performance Indicator: Apply safety/health practices to AFNR worksites.			Science: F1 and F5
CT-FS.05.01.01.a. Implement the health and safety policies and procedures relevant to AFNR careers.	CT-FS.05.01.01.b. Use appropriate personal protective equipment for a given task.	CT-FS.05.01.01.c. Orient a group on safety measures based on the prescribed safety guidelines.	
CT-FS.05.02. Performance Indicator: Demonstrate recognized first aid knowledge and procedures to show how they are used by AFNR industries.			Science: F5
CT-FS.05.02.01.a. Inform others how to avoid placing oneself in hazardous work situations.	CT-FS.05.02.01.b. Use first aid knowledge and procedures relevant to a particular situation.	CT-FS.05.02.01.c. Complete a recognized industry-level first aid training program.	

CT-FS.05.03. Performance Indicator: Follow appropriate procedures in case of an emergency.			
CT-FS.05.03.01.a. Evaluate the emergency response procedures for a natural disaster.	CT-FS.05.03.01.b. Develop various emergency response plan requirements for a facility.	CT-FS.05.03.01.c. Communicate the appropriate responses for medical emergencies by following the approved procedures.	
CT-FS.05.04. Performance Indicator: Assess workplace safety.			Science: F5 Mathematics: SMP4
CT-FS.05.04.01.a. Research applicable regulatory and safety standards (e.g., MSDS, bioterrorism).	CT-FS.05.04.01.b. Use safety procedures to comply with regulatory and safety standards.	CT-FS.05.04.01.c. Apply general workplace safety precautions/procedures.	
CT-FS.05.04.02.a. Handle chemicals and equipment in a safe and appropriate manner.	CT-FS.05.04.02.b. Maintain AFNR facilities to promote health and safety.	CT-FS.05.04.02.c. Evaluate general workplace safety precautions/procedures for compliance with regulations.	
CT-FS.06. Performance Element: Technical Skills: Use tools, equipment, machinery and technology appropriate to work within areas related to AFNR.			
CT-FS.06.01. Performance Indicator: Evaluate and select the appropriate tool to perform a given task.			
CT-FS.06.01.01.a. Identify standard tools, equipment, and safety procedures related to a specific task.	CT-FS.06.01.01.b. Set up/adjust tools and equipment related to complete a specific task.	CT-FS.06.01.01.c. Use tools and equipment appropriately to complete a specific task.	
CT-FS.06.01.02.a. Follow operating instructions related to specific tools and equipment needed to complete a task.	CT-FS.06.01.02.b. Demonstrate appropriate operation, storage, and maintenance techniques for tools and equipment.	CT-FS.06.01.02.c. Devise a maintenance plan or schedules for tools and equipment.	
CT-FS.06.02. Performance Indicator: Use appropriate protective equipment and handle AFNR tools and equipment to demonstrate safe and proper use of the tools and equipment.			Science: F5
CT-FS.06.02.01.a. Use the appropriate procedures for the use and operation of specific tools and equipment.	CT-FS.06.02.01.b. Demonstrate safety precautions when using tools for a specific task around bystanders.	CT-FS.06.02.01.c. Operate applicable AFNR equipment and vehicles safely.	
CT-FS.06.03. Performance Indicator: Maintain tools for efficient use.			
CT-FS.06.03.01.a. Describe the conditions that cause the need for tool maintenance.	CT-FS.06.03.01.b. Demonstrate how to replace tool parts and components as needed.	CT-FS.06.03.01.c. Develop and update a preventive maintenance schedule.	
CT-FS.10. Performance Element: Technical Skills: Compare and contrast issues affecting the AFNR industry.			
CT-FS.10.01. Performance Indicator: Apply economic principles to AFNR systems (e.g., supply, demand and profit).			Language Arts: 4 Social Studies: 7a and 7b Mathematics: SMP3
CT-FS.10.01.01.a. Calculate the effect of compound interest on AFNR investments.	CT-FS.10.01.01.b. Describe the economic impacts of natural resource preservation vs. use of	CT-FS.10.01.01.c. Describe the impacts of AFNR decisions on global markets	

	the resource.	and environmental health.	
CT-FS.10.02. Performance Indicator: Apply skills with computer software to accomplish a variety of business activities.			Science: A3
CT-FS.10.02.01.a. Demonstrate basic computer and software systems skills.	CT-FS.10.02.01.b. Use basic software systems such as spreadsheet and word processing to complete a task.	CT-FS.10.02.01.c. Use diagnostic software.	
CT-FS.10.03. Performance Indicator: Use technology to demonstrate the ability to network and interface with technology.			Science: A3 and E2
CT-FS.10.03.01.a. Use the technological systems to acquire information related to AFNR.	CT-FS.10.03.01.b. Show technical competence for efficient workplace communications.	CT-FS.10.03.01.c. Demonstrate the use of technology in linking information from various sources.	
CT-FS.10. Performance Element: Technical Skills: Envision emerging technology and globalization to project its influence on widespread markets.			
CT-FS.10.01. Performance Indicator: Examine new technologies to project their impact in the global market of AFNR.			Science: F6
CT-FS.10.01.01.a. Apply the use of various scientific measurement and conversions to AFNR systems.	CT-FS.10.01.01.b. Discuss the use of mechatronic-FS (such as lasers and robotics and their impact on AFNR systems.	CT-FS.10.01.01.c. Evaluate the importance of new and emerging communication systems and how they impact AFNR systems.	
CT-FS.10.02. Performance Indicator: Relate technology advancements to the need for Continuing Education/Career Development.			Mathematics: SMP5
CT-FS.10.02.01.a. Utilize historical data, technology and career training to predict market trends.	CT-FS.10.02.01.b. Apply emerging technology and career training to meet market demands.	CT-FS.10.02.01.c. Research emerging technologies and the opportunities they may create within the AFNR systems.	
CT-FS.11. Performance Element: Scientific Inquiry: Utilize scientific inquiry as an investigative method.			
CT-FS.11.01. Performance Indicator: Recognize the questions and theory needed to guide scientific investigations.			Math: CCSS:N-Q1, SMP5 Science: A1 and A2
CT-FS.11.01.01.a. Formulate a testable hypothesis.	CT-FS.11.01.01.b. Design an experiment to test a hypothesis.	CT-FS.11.01.01.c. Demonstrate procedures and a conceptual understanding of scientific investigation.	
CT-FS.11.02. Performance Indicator: Design and conduct a scientific investigation.			Math: CCSS:N-Q1, SMP3 Science: A1 and A2 Language Arts: 7
CT-FS.11.02.01.a. Design an experiment or scientific inquiry for a specific project.	CT-FS.11.02.01.b. Implement an experimental design to test a formulated hypothesis.	CT-FS.11.02.01.c. Propose additional studies based on the results of an experiment.	

CT-FS.12.03. Performance Indicator: Flexibility / Adaptability: Describe traits that enable one to be capable and willing to accept change.			Science: A2, A6 and E2 Language Arts: 7 Social Studies: 8a
CT-FS.12.03.01.a. Research current and emerging technologies in AFNR.	CT-FS.12.03.01.b. Analyze the advantages and disadvantages of current and emerging technologies in AFNR activities.	CT-FS.12.03.01.c. Conduct a workplace study to assess the benefits to adapting emerging technologies.	
CT-FS.12.03.02.a. Select the appropriate process to initiate effective change for a given situation.	CT-FS.12.03.02.b. Assess the benefits of using the change process.	CT-FS.12.03.02.c. Evaluate strategies that can be used to manage change within the workplace.	
CT-FS.12.03.03.a. Assess to the value of providing feedback.	CT-FS.12.03.03.b. Differentiate between positive and negative constructive feedback and realize the importance of both.	CT-FS.12.03.03.c. Respond to feedback to improve a situation, skill or performance.	Mathematics:SMP4
CT-FS.13. Performance Element: Systems: Examine roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.			
CT-FS.13.01. Performance Indicator: Examine performance and goals to appreciate organizations and industries within AFNR.			Mathematics:SMP3
CT-FS.13.01.01.a. Examine performance and goals to appreciate professional organizations and industries within AFNR.	CT-FS.13.01.01.b. Explain the major guidelines used by AFNR professional organizations to manage and improve performance.	CT-FS.13.01.01.c. Examine economic, social and technological changes and spotlights their impact on AFNR professional organizations and the industry.	
CT-FS.14. Performance Element: Systems: Identify how key organizational structures and processes affect organizational performance and the quality of products and services.			
CT-FS.14.01. Performance Indicator: Manage organizational structures and processes to better serve customers.			Social Studies: 7a
CT-FS.14.01.01.a. List ways an organization can be evaluated based on its customer satisfaction and service operations.	CT-FS.14.01.01.b. Explain how organization performance including customer satisfaction and service/operations performance can be improved.	CT-FS.14.01.01.c. Implement a plan to manage relationships with both internal and external customers.	
CT-FS.14.02. Performance Indicator: Examine the components of the AFNR systems and address their maintenance requirements.			
CT-FS.14.02.01.a. Develop goals and objectives for each system to manage organizational activities more effectively.	CT-FS.14.02.01.b. Operate technical tools to access, manage, integrate, evaluate and create information.	CT-FS.14.02.01.c. Implement management plans to improve the AFNR systems.	

CT-FS.14.03. Performance Indicator: Research geographical data related to AFNR systems.			Math: CCSS: S-ID.1 ; S-ID.2; SMP6 Language Arts: 4 Social Studies: 3c and 3e
CT-FS.14.03.01.a. Present resource data in graphic format.	CT-FS.14.03.01.b. Interpret resource data in graphic format.	CT-FS.14.03.01.c. Use computer systems to present trends in resource data.	
CT-FS.14.03.02.a. Utilize the different types of AFNR systems related to various geographical areas.	CT-FS.14.03.02.b. Explore how AFNR systems differ across geographical areas.	CT-FS.14.03.02.c. Evaluate the effects of implementing an AFNR system in a different geographical area.	

Leadership Skills

Pathway Content Standard: The student will demonstrate competence in the application of leadership, personal growth and career success skills necessary for a chosen profession while effectively contributing to society.

Level 1	Level 2	Level 3	National Academic Standard
CT-LS.01. Performance Element: Premier Leadership: Acquire the skills necessary to positively influence others.			
CT-LS.01.01. Performance Indicator: Action: Exhibit the skills and competencies needed to achieve a desired result.			Social Studies: 4d and 4h
CT-LS.01.01.01.a. Work productively with a group or independently.	CT-LS.01.01.01.b. Demonstrate the ability to complete a task without assistance.	CT-LS.01.01.01.c. Work independently and in group settings to accomplish a task.	
CT-LS.01.01.02.a. Create a task analysis.	CT-LS.01.01.02.b. Create measurable objectives for a given situation.	CT-LS.01.01.02.c. Assess outcomes to determine success for a task.	
CT-LS.01.01.03.a. Exhibit good planning skills for a specific task or situation.	CT-LS.01.01.03.b. Assess individual strengths and weaknesses in planning.	CT-LS.01.01.03.c. Implement an effective project plan.	
CT-LS.01.01.04.a. Explore available resources to assist in meeting project needs.	CT-LS.01.01.04.b. Use appropriate and reliable resources to complete an action or project.	CT-LS.01.01.04.c. Create resources to complete an action or project.	
CT-LS.01.01.05.a. Assess the physical, financial and professional risks associated with a particular task.	CT-LS.01.01.05.b. Create a plan for performing a job that will minimize physical, financial and professional risks.	CT-LS.01.01.05.c. Implement a plan that minimizes physical, financial, and professional risks and analyzes results.	Mathematics:SMP4
CT-LS.01.01.06.a. Identify the strengths/talents of team members needed to achieve a desired task.	CT-LS.01.01.06.b. Assign project parts equitably amongst team members to achieve a given task.	CT-LS.01.01.06.c. Develop strengths and talents of team members so that all can achieve success.	
CT-LS.01.01.07.a. Set personal goals using the SMART goals method (Specific, Measurable, Approved by you, Realistic, Time-stamped).	CT-LS.01.01.07.b. Use a variety of strategies to evaluate goals (e.g., observes, apply, and demonstrate).	CT-LS.01.01.07.c. Evaluate actions taken and make appropriate modifications to personal goals.	
CT-LS.01.02. Performance Indicator: Relationships: Build a constituency through listening, coaching, understanding and appreciating others.			Language Arts: 12Social Studies: 4h
CT-LS.01.02.01.a. Explain human relation skills such as compassion, empathy, unselfishness, trustworthiness, reliability and being friendly.	CT-LS.01.02.01.b. Determine human relation skills characteristic CT-LS of people who exhibit compassion, empathy, unselfishness, trustworthiness, reliability and being friendly.	CT-LS.01.02.01.c. Demonstrate human relation skills including compassion, empathy, unselfishness, trustworthiness, reliability and being friendly to co-workers.	

CT-LS.01.02.02.a. Engage in a conversation with others to identify their interests and aspirations.	CT-LS.01.02.02.b. Utilize communication skills to collaborate in a group setting.	CT-LS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.	
CT-LS.01.02.03.a. Identify the steps/strategies to successfully coach/mentor others.	CT-LS.01.02.03.b. Perform the steps/strategies to successfully coach/mentor others.	CT-LS.01.02.03.c. Manage a coaching/mentoring program.	
CT-LS.01.02.04.a. Identify characteristics CT-LS of effective teams.	CT-LS.01.02.04.b. Establish team ground rules for expected individual behaviors on the team.	CT-LS.01.02.04.c. Evaluate the effectiveness of team members.	
CT-LS.01.03. Performance Indicator: Vision: Establish a clear image of what the future should look like.			Social Studies: 4a, 4d and 4h
CT-LS.01.03.01.a. Identify the benefits of developing vision.	CT-LS.01.03.01.b. Utilize visioning skills to develop a plan.	CT-LS.01.03.01.c. Develop vision statements and plans for an organization.	
CT-LS.01.03.02.a. Use various conceptualizing tools.	CT-LS.01.03.02.b. Compare conceptualizing tools to use in a given situation.	CT-LS.01.03.02.c. Create a plan of action to complete a task based on a conceptualized idea.	
CT-LS.01.03.03.a. Analyze the risks and rewards of new experiences.	CT-LS.01.03.03.b. Analyze a case study involving a new experience for risk and rewards.	CT-LS.01.03.03.c. Conduct a self-evaluation for personal reactions to new experiences.	
CT-LS.01.03.04.a. Describe techniques used to build consensus.	CT-LS.01.03.04.b. Demonstrate consensus building.	CT-LS.01.04.05.c. Lead a meeting or activity that engages all participants in the process.	
CT-LS.01.04. Performance Indicator: Character: Conduct professional and personal activities based on virtues.			Social Studies: 4c and 4f
CT-LS.01.04.01.a. Analyze a case study where integrity was demonstrated.	CT-LS.01.04.01.b. Explain a personal decision where integrity played a role in the decision.	CT-LS.01.04.01.c. Perform tasks with integrity.	
CT-LS.01.04.02.a. Describe personal values.	CT-LS.01.04.02.b. Demonstrate the benefits of living by positive values.	CT-LS.01.04.02.c. Assess personal values.	
CT-LS.01.04.03.a. Identify the consequences of personal actions.	CT-LS.01.04.03.b. Assess the alternative outcome of specific actions.	CT-LS.01.04.03.c. Analyze the causes for team members to accept or reject responsibility.	
CT-LS.01.04.04.a. Explain the benefits of mutual respect.	CT-LS.01.04.04.b. Analyze how respect is given.	CT-LS.01.04.04.c. Demonstrate respect for others.	

CT-LS.01.04.05.a. Practice self-discipline.	CT-LS.01.04.05.b. Differentiate between habits, practices and behaviors consistent with principles of self-discipline.	CT-LS.01.04.05.c. Analyze one's level of self-discipline and causes for lack of self-discipline.	
CT-LS.01.04.06.a. Describe the benefits of serving others.	CT-LS.01.04.06.b. Develop personal goals that include service to others.	CT-LS.01.04.06.c. Evaluate professional and personal values and how they are applied in the service to others.	
CT-LS.01.05. Performance Indicator: Awareness: Desire purposeful understanding related to professional and personal activities.			Language Arts: 1 Social Studies: 1e, 4e, 10b and 10j
CT-LS.01.05.01.a. Discuss trends and issues important to the community.	CT-LS.01.05.01.b. Analyze the impact of trends and issues on the community.	CT-LS.01.05.01.c. Articulate current issues those are important to the local, state, national and global communities.	
CT-LS.01.05.02.a. Identify civic leadership role opportunities.	CT-LS.01.05.02.b. Demonstrate responsible citizenship.	CT-LS.01.05.02.c. Perform leadership tasks associated with citizenship.	
CT-LS.01.05.03.a. Explain benefits and challenges of working in a diverse group.	CT-LS.01.05.03.b. Engage in activities to help develop personal awareness of diversity.	CT-LS.01.05.03.c. Plan an activity that promotes appreciation of diversity.	
CT-LS.01.06. Performance Indicator: Continuous Improvement: Pursue learning and growth opportunities related to professional and personal aspirations.			Science: A4 Language Arts: 8 Social Studies: 4h
CT-LS.01.06.01.a. Explain the reasons for having a leadership/personal growth plan.	CT-LS.01.06.01.b. Develop a plan that includes specific goals for leadership and personal growth.	CT-LS.01.06.01.c. Implement a leadership and personal growth plan.	
CT-LS.01.06.02.a. Describe the role and purpose of a personal mentor.	CT-LS.01.06.02.b. Identify areas where a personal mentor could be helpful.	CT-LS.01.06.02.c. Serve as a mentor for others.	
CT-LS.01.06.03.a. Identify the different types of problem solving models and their applicability to specific situations.	CT-LS.01.06.03.b. Utilize a problem-solving model to solve a given problem.	CT-LS.01.06.03.c. Use problem solving strategies to solve a professional or personal issue.	
CT-LS.01.06.04.a. Use various emerging technologies to enhance a program or project.	CT-LS.01.06.04.b. Evaluate the effectiveness of current technologies.	CT-LS.01.06.04.c. Make recommendations to adopt new emerging technologies.	
CT-LS.01.06.05.a. Describe the value of being a life-long learner and the need for continuous development.	CT-LS.01.06.05.b. Assess personal motivations and their impact on acquiring new knowledge and skills.	CT-LS.01.06.05.c. Implement a plan to develop new knowledge and skills related to professional and personal aspirations.	

CT-LS.02. Performance Element: Personal Growth: Develop a skill set to enhance the positive evolution of the whole person.			
CT-LS.02.01. Performance Indicator: Physical Growth: Address personal health by understanding, respecting and managing your body's needs.			Science: F1
CT-LS.02.01.01.a. Identify how healthy and unhealthy food affects one's body.	CT-LS.02.01.01.b. Create a balanced menu to ensure appropriate proportions of desired nutritional elements.	CT-LS.02.01.01.c. Practice healthy eating habits.	
CT-LS.02.01.02.a. Describe the benefits, risks and opportunities associated with being physically fit.	CT-LS.02.01.02.b. Implement a plan for respecting one's body.	CT-LS.02.01.02.c. Make recommendations or changes to a personal fitness program regiment.	
CT-LS.02.01.03.a. Describe practices that must be maintained to achieve long-term health.	CT-LS.02.01.03.b. Implement a plan to achieve long-term health.	CT-LS.02.01.03.c. Evaluate personal lifestyle as related to long-term health.	
CT-LS.02.02. Performance Indicator: Social Growth: Interact with others in a manner that respects the differences of a diverse and changing society.			Language Arts: 12 Social Studies: 1e
CT-LS.02.02.01.a. Discover the different cultures that exist in one's community.	CT-LS.02.02.01.b. Compare and contrast the customs of different cultures.	CT-LS.02.02.01.c. Engage in a project that educates others about different cultures from within the community.	
CT-LS.02.02.02.a. Demonstrate proper conduct and appearances for various settings.	CT-LS.02.02.02.b. Apply the skills required to present one appropriately in various settings.	CT-LS.02.02.02.c. Present one appropriately in various settings.	
CT-LS.02.02.03.a. Identify the skills needed to develop a professional relationship.	CT-LS.02.02.03.b. Exhibit the behaviors needed for developing and maintaining a professional relationship.	CT-LS.02.02.03.c. Identify ways to develop and maintain professional relationships to enhance career success (E28; E33 Aquaculture).*	
CT-LS.02.03. Performance Indicator: Professional Growth: Develop awareness and apply skills necessary for achieving career success.			Language Arts: 12 Social Studies: 4a
CS.02.03.01.a. Explore various career interests/options.	CT-LS.02.03.01.b. Make decisions to plan for a personal career.	CT-LS.02.03.01.c. Implement a plan to achieve career goals and priorities.	
CT-LS.02.03.02.a. Chart the components to creating a balanced work/life plan.	CT-LS.02.03.02.b. Determine the level of non-essential actions/tasks related to personal and work life.	CT-LS.02.03.02.c. Balance personal and work responsibilities.	
CT-LS.02.03.03.a. Identify the employability skills required for various careers in agriculture (E25; E30 Aquaculture).*	CT-LS.02.03.03.b. Develop skills required for a specific career.	CT-LS.02.03.03.c. Demonstrate employability skills for a specific career.	

CT-LS.02.04. Performance Indicator: Professional Growth: Create resumes and cover letters for employment opportunities.			Language Arts: 12 Social Studies: 4a
CT-LS.02.04.03.a. Describe the purpose of a resume and cover letter. (E26; E31 Aquaculture).*	CT-LS.02.04.03.b. Analyze the steps in a job search including preparing the cover letter, resume and application, and participating in the interview process (E27; E32 Aquaculture).*	CT-LS.02.04.01.c. Create a resume and cover letter for employment.	
CT-LS.02.04. Performance Indicator: Mental Growth: Demonstrate the effective application of reasoning, thinking, and coping skills.			Science: A4 Language Arts: 4 and 8
CT-LS.02.04.01.a. Describe the skills necessary to think critically and creatively.	CT-LS.02.04.01.b. Discuss the benefits of thinking critically and creatively.	CT-LS.02.04.01.c. Demonstrate critical and creative thinking skills while completing a task.	
CT-LS.02.04.02.a. Explore tools used in creative problem-solving.	CT-LS.02.04.02.b. Analyze problems that were solved well and problems that were not solved well.	CT-LS.02.04.02.c. Implement effective problem solving strategies.	
CT-LS.02.04.03.a. Discuss the skills and techniques needed to negotiate effectively.	CT-LS.02.04.03.b. Analyze case studies where negotiation techniques are used.	CT-LS.02.04.03.c. Demonstrate the skills needed to negotiate with others.	
CT-LS.02.05. Performance Indicator: Emotional Growth: Demonstrate healthy responses to one's feelings.			Social Studies: 4a
CT-LS.02.05.01.a. Describe skills used to cope with different situations.	CT-LS.02.05.01.b. Determine the coping process that best fits one's situation.	CT-LS.02.05.01.c. Demonstrate one's ability to cope with life's trials.	
CT-LS.02.05.02.a. Discover the characteristics of selfless and compassionate individuals.	CT-LS.02.05.02.b. Determine opportunities to demonstrate selflessness and compassion towards others.	CT-LS.02.05.02.c. Practice the skills needed to live a compassionate and selfless life.	
CT-LS.02.05.03.a. Describe the factors needed to build self-confidence.	CT-LS.02.05.03.b. Analyze an individual's personal level of self-confidence.	CT-LS.02.05.03.c. Exhibit self-confidence while in the workplace.	
CT-LS.02.05.04.a. Analyze the benefits of emotional development.	CT-LS.02.05.04.b. Practice habits that positively affect emotional well-being.	CT-LS.02.05.04.c. Develop emotional well-being in other team members.	
CT-LS.02.05.05.a. Describe situations where seeking counsel would be appropriate (e.g., personal, legal, financial, etc.).	CT-LS.02.05.05.b. Analyze the positive outcomes of seeking counsel through an appropriate source.	CT-LS.02.05.05.c. Seek appropriate counsel for specific situations (e.g., personal, legal, financial, etc.).	

CT-LS.02.06. Performance Indicator: Spiritual Growth: Reflect inner strength to allow one to define personal beliefs, values, principles and sense of balance.			Social Studies: 4c and 4f
CT-LS.02.06.01.a. Define the terms: value, beliefs, and belief system.	CT-LS.02.06.01.b. Create a personal belief statement.	CT-LS.02.06.01.c. Develop and nurture a personal belief system.	
CT-LS.02.06.02.a. Describe respectful, sensitive behaviors that can influence others.	CT-LS.02.06.02.b. Explain how respectful, sensitive behaviors lead to increased influence.	CT-LS.02.06.02.c. Demonstrate respect and sensitivity to others' beliefs.	
CT-LS.03. Performance Element: Career Success: Demonstrate those qualities, attributes and skills necessary to succeed in, or further prepare for, a chosen career while effectively contributing to society.			
CT-LS.03.01. Performance Indicator: Communication: Demonstrate oral, written and verbal skills.			Language Arts: 4, 5 and 12
CT-LS.03.01.01.a. Use basic technical and business writing skills.	CT-LS.03.01.01.b. Select the appropriate form of technical and business writing or communication for a specific situation.	CT-LS.03.01.01.c. Demonstrate technical and business writing skills to communicate effectively with co-workers and supervisors.	
CT-LS.03.01.02.a. Describe the various types and uses of resumes.	CT-LS.03.01.02.b. Prepare a resume.	CT-LS.03.01.02.c. Demonstrate effective use of a resume as part of an effort to obtain a job.	
CT-LS.03.01.03.a. Develop an outline or plan for a business presentation.	CT-LS.03.01.03.b. Deliver a business presentation for a peer group (e.g., class presentation).	CT-LS.03.01.03.c. Make effective business presentations.	
CT-LS.03.02. Performance Indicator: Decision Making – Analyze situations and execute an appropriate course of action.			Science: A1 and A5 Social Studies: 1c and 4h
CT-LS.03.02.01.a. Analyze the steps in the decision-making process.	CT-LS.03.02.01.b. Utilize the process used to reach a conclusion for a decision.	CT-LS.03.02.01.c. Make decisions for a given situation by applying the decision-making process.	
CT-LS.03.02.02.a. Select resources to help in the problem-solving process.	CT-LS.03.02.02.b. Determine information that is critical to solving problems.	CT-LS.03.02.02.c. Use problem-solving skills.	
CT-LS.03.02.03.a. Differentiate between ethical and unethical behavior.	CT-LS.03.02.03.b. Practice ethical behaviors.	CT-LS.03.02.03.c. Examine an ethical dilemma and prepare an argument for a position.	
CT-LS.03.02.04.a. Use an interest inventory to determine goals appropriate to personal passions, abilities and aptitudes.	CT-LS.03.02.04.b. Assess personal skills to set goals for success in a career.	CT-LS.03.02.04.c. Implement appropriate preparation plans for a career path based on passion, abilities, aptitude, opportunities.	

CT-LS.03.03. Career Exploration and Development: Understand the diversity of careers related to the agricultural industry and strategies to acquire and advance in an agricultural career.			
CT-LS.03.03.01.a. Identify and demonstrate appropriate conduct at FFA meetings (F29; F34 Aquaculture).*	CT-LS.03.03.01.b. Explain effective implementation of parliamentary procedure (F30; F35 Aquaculture).*		
CT-LS.03.01.02.a. Explain effective communication skills (F31; F36 Aquaculture).*	CT-LS.03.01.02.b. Describe the qualities and characteristics of an effective leader (F32; F37 Aquaculture).*	CT-LS.03.01.02.c. Identify and apply the various roles and responsibilities of a leader within an organization (F33; F38 Aquaculture).*	

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Animal Science

Pathway Content Standard: The student will demonstrate competence in the application of scientific principles and practices to the production and management of animals.

Level 1	Level 2	Level 3	National Academic Standard
CT-AS.01. Performance Element: Examine the components, <u>historical</u> development, <u>global</u> implications and <u>future</u> trends of the animal systems industry.			
CT-AS.01.01. Performance Indicator: Evaluate the development and implications of animal origin, domestication and distribution.			Science: C3 Social Studies: 7h Mathematics:SMP4
CT-AS.01.01.01.a. Identify the origin, significance, distribution and domestication of animal species.	CT-AS.01.01.01.b. Evaluate and describe characteristics of animals that developed in response to the animals' environment and led to their domestication.	CT-AS.01.01.01.c. Predict adaptations of animals to production practices and environments.	
CT-AS.01.01.02.a. Identify the products, services and careers within the companion, production and/or lab animal industry (A6).*	CT-AS.01.01.02.b. Outline the development of the animal industry and the resulting products, services and careers.	CT-AS.01.01.02.c. Predict trends and implications of future development of the animal systems industry.	
CT-AS.02. Performance Element: Classify, evaluate, select, and manage animals based on <u>anatomical</u> and <u>physiological</u> characteristics.			
CT-AS.02.01. Performance Indicator: Classify animals according to hierarchical taxonomy and agricultural use.			Science: C3
CT-AS.02.01.01.a. Explain the importance of the binomial system of nomenclature.	CT-AS.02.01.01.b. Explain how animals are classified using Linnaeus's taxonomical classification system.	CT-AS.02.01.01.c. Classify animals according to the taxonomical classification system.	
CT-AS.02.01.02.a. Explain how companion, production and/or lab animals are scientifically classified (A4).*	CT-AS.02.01.02.b. Compare and contrast the hierarchical classification of the major agricultural animal species.	CT-AS.02.01.02.c. Appraise and evaluate the economic value of animals for various applications in the agriculture industry.	Mathematics:SMP2
CT-AS.02.01.03.a. Identify breeds and types of companion, production and/or lab animals (A1).*			
CT-AS.02.02. Performance Indicator: Apply principles of comparative anatomy and physiology to uses within various animal systems.			Science: C1, C5 and F2
CT-AS.02.02.01.a. Identify basic characteristics of animal cells, tissues, organs and body systems.	CT-AS.02.02.01.b. Compare and contrast animal cells, tissues, organs and body systems.	CT-AS.02.02.01.c. Explain how the components and systems of animal anatomy and physiology relate to the production and use of animals.	

CT-AS.02.02.02.a. Diagram a typical animal cell and identify the organelles.	CT-AS.02.02.02.b. Describe the functions of animal cell structures.	CT-AS.02.02.02.c. Describe the molecular makeup of animal cells and its importance in animal production and management.	
CT-AS.02.02.03.a. Describe the basic functions of animal cells in growth and reproduction.	CT-AS.02.02.03.b. Detail the processes of meiosis and mitosis in animal growth, development, health and reproduction.	CT-AS.02.02.03.c. Explain the application of the processes of meiosis and mitosis to animal growth, development, health and reproduction.	
CT-AS.02.02.04.a. Describe the properties, locations, functions and types of animal tissues.	CT-AS.02.02.04.b. Explain the relationship of animal tissues to growth, performance and health.	CT-AS.02.02.04.c. Explain the importance and uses made of animal tissues in the agriculture industry.	
CT-AS.02.02.05.a. Describe the properties, locations, functions and types of animal organs.	CT-AS.02.02.05.b. Compare and contrast organ types and functions among animal species.	CT-AS.02.02.05.c. Relate the importance of animal organs to the health, growth and reproduction of animals.	
CT-AS.02.02.06.a. Describe the functions of the animal body systems and system components.	CT-AS.02.02.06.b. Compare and contrast body systems and system adaptations between animal species.	CT-AS.02.02.06.c. Explain the impact of animal body systems on performance, health, growth and reproduction.	
CT-AS.02.02.07a. Demonstrate knowledge of the principles of comparative anatomy and physiology to uses within companion, production and/or lab animal systems (A11).*			
CT-AS.02.03. Performance Indicator: Select animals for specific purposes and maximum performance based on anatomy and physiology.			Science: C5 Mathematics:SMP2, SMP3, SMP4
CT-AS.02.03.01.a. Identify ways an animal's health can be affected by anatomical and physiological disorders.	CT-AS.02.03.01.b. Compare and contrast desirable anatomical and physiological characteristics of animals within and between species.	CT-AS.02.03.01.c. Evaluate and select animals to maximize performance based on anatomical and physiological characteristics that affect health, growth and reproduction.	
CT-AS.02.03.02.a. Create a program to develop an animal to its highest potential performance.	CT-AS.02.03.02.b. Assess an animal to determine if it has reached its optimal performance level based on anatomical and physiological characteristics.	CT-AS.02.03.02.c. Develop efficient procedures to produce consistently high-quality animals well suited for their intended purposes.	

CT-AS.03. Performance Element: Provide for the proper <u>health care</u> of animals.			
CT-AS.03.01. Performance Indicator: Prescribe and implement a prevention and treatment program for animal diseases, parasites and other disorders.			Math: CCSS: N-Q; SMP6 Science: C4, F1 and F5
CT-AS.03.01.01.a. Maintain animal health and sanitation for companion, production and/or lab animals (A2).*	CT-AS.03.01.01.b. Follow industry protocols for animal health.	CT-AS.03.01.01.c. Evaluate animals for health and sanitation.	
CT-AS.03.01.02.a. Understand the procedures to maintain health and production records for companion, production and/or lab animals (A8).*	CT-AS.03.01.02.b. Perform simple health-check evaluations on animals.	CT-AS.03.01.02.c. Perform diagnostic tests to detect health problems in animals.	
CT-AS.03.01.03.a. Recognize diseases and ailments of companion, production and/or lab animals (A3).*	CT-AS.03.01.03.b. Diagnose illnesses and disorders of animals based on symptoms and problems caused by diseases, parasites and physiological disorders.	CT-AS.03.01.03.c. Treat common diseases, parasites and physiological disorders of animals.	
CT-AS.03.01.04.a. Explain characteristics of causative agents and vectors of diseases and disorders in animals.	CT-AS.03.01.04.b. Evaluate preventive measures for controlling and limiting the spread of diseases, parasites and disorders among animals.	CT-AS.03.01.04.c. Design and implement a health maintenance and disease and disorder prevention plan for animals in their natural and/or confined environments.	
CT-AS.03.01.05.a. Explain the clinical significance of common considerations in veterinary treatments, such as aseptic techniques.	CT-AS.03.01.05.b. Prepare animals, facilities and equipment for surgical and nonsurgical veterinary treatments and procedures.	CT-AS.03.01.05.c. Perform surgical and nonsurgical veterinary treatments and procedures in animal health care.	
CT-AS.03.01.06.a. Identify and describe zoonotic diseases.	CT-AS.03.01.06.b. Explain the health risk of zoonotic diseases to humans and their historical significance and future implications.	CT-AS.03.01.06.c. Implement zoonotic disease prevention methods and procedures for the safe handling and treatment of animals.	
CT-AS.03.02. Performance Indicator: Provide for the biosecurity of agricultural animals and production facilities.			Science: F5 and F6 Social Studies: 9d
CT-AS.03.02.01.a. Explain the importance of biosecurity to the animal industry.	CT-AS.03.02.01.b. Discuss procedures at the local, state and national levels to ensure biosecurity of the animal industry.	CT-AS.03.02.01.c. Implement a biosecurity plan for an animal production operation.	

CT-AS.04. Performance Element: Apply principles of animal <u>nutrition</u> to ensure the proper growth, development, reproduction and economic production of animals.			
CT-AS.04.01. Performance Indicator: Formulate feed rations to provide for the nutritional needs of animals.			Math: CCSS: A-CED.1; SMP1, SMP4 Science: A4 and C5
CT-AS.04.01.01.a. Compare and contrast common types of feedstuffs and the roles they play in the diets of animals.	CT-AS.04.01.01.b. Calculate costs and analyses of feed for companion, production and/or lab animals (A5).*	CT-AS.04.01.01.c. Select appropriate feedstuffs for animals based on factors such as economics, digestive system and nutritional needs.	
CT-AS.04.01.02.a. Explain the importance of a balanced ration for animals.	CT-AS.04.01.02.b. Appraise the adequacy of feed rations using data from the analysis of feedstuffs, animal requirements and performance.	CT-AS.04.01.02.c. Formulate animal feeds based on nutritional requirements, using feed ingredients for maximum nutrition and optimal economic production.	
CT-AS.04.02. Performance Indicator: Formulate and administer animal supplements, animal feed additives and growth promotes in animal production.			Math: CCSS: A-CED.1; SMP1 Science: C5
CT-AS.04.02.01.a. Explain the purpose and benefits of feed additives and growth promotes in animal production.	CT-AS.04.02.01.b. Discuss how feed additives and growth promotions are administered and the precautions that should be taken.	CT-AS.04.02.01.c. Prescribe and administer feed additives and growth promotions.	
CT-AS.05. Performance Element: Evaluate and select animals based on <u>scientific principles</u> of animal production.			
CT-AS.05.01. Performance Indicator: Evaluate the male and female reproductive systems in selecting animals.			Science: C1 and C3
CT-AS.05.01.01.a. Explain the male and female reproductive organs of the major animal species.	CT-AS.05.01.01.b. Describe the functions of major organs in the male and female reproductive systems.	CT-AS.05.01.01.c. Select breeding animals based on characteristics of the reproductive organs.	
CT-AS.05.02. Performance Indicator: Evaluate animals for breeding readiness and soundness.			Science: C6
CT-AS.05.02.01.a. Explain how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female animals.	CT-AS.05.02.01.b. Summarize factors that lead to reproductive maturity.	CT-AS.05.02.01.c. Evaluate and select animals for reproductive readiness.	
CT-AS.05.02.02.a. Discuss the importance of efficient and economic reproduction in animals.	CT-AS.05.02.02.b. Evaluate reproductive problems that occur in animals.	CT-AS.05.02.02.c. Treat or cull animals with reproductive problems.	

CT-AS.05.03. Performance Indicator: Apply scientific principles in the selection and breeding of animals.			Math: CCSS: N-Q; CCSS: S-ID; SMP1, SMP4 Science: A4, C2 and E2
CT-AS.05.03.01.a. Explain genetic inheritance in agricultural animals.	CT-AS.05.03.01.b. Explain the advantages of using genetically superior animals in the production of animals and animal products.	CT-AS.05.03.01.c. Select a breeding system based on the principles of genetics.	
CT-AS.05.03.02.a. Define natural and artificial breeding methods.	CT-AS.05.03.02.b. Explain the processes of natural and artificial breeding methods.	CT-AS.05.03.02.c. Select animal breeding methods based on reproductive and economic efficiency.	
CT-AS.05.03.03.a. Explain the use of quantitative breeding values (e.g., EPDs) in the selection of genetically superior breeding stock.	CT-AS.05.03.03.b. Compare and contrast quantitative breeding value differences between genetically superior animals and animals of average genetic value.	CT-AS.05.03.03.c. Select animals based on quantitative breeding values for specific characteristics.	
CT-AS.05.03.04.a. Explain the advantages of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer.	CT-AS.05.03.04.b. Explain the processes of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer.	CT-AS.05.03.04.c. Perform procedures for estrous synchronization, superovulation, flushing, embryo transfer and other reproductive management practices.	
CT-AS.05.03.05.a. Discuss the uses and advantages and disadvantages of natural breeding and artificial insemination.	CT-AS.05.03.05.b. Explain the materials, methods and processes of artificial insemination.	CT-AS.05.03.05.c. Demonstrate artificial insemination techniques.	
CT-AS.05.03.06.a. Discuss the principles of companion, production and/or lab animal reproduction, genetics and the application of new and emerging technologies in animal reproduction (A9).*			
CT-AS.06. Performance Element: Prepare and implement <u>animal handling procedures</u> for the safety of animals, producers and consumers of animal products.			
CT-AS.06.01. Performance Indicator: Demonstrate safe animal handling and management techniques.			Science: C6
CT-AS.06.01.01.a. Discuss the dangers involved in working with animals.	CT-AS.06.01.01.b. Outline safety procedures for working with animals by species.	CT-AS.06.01.01.c. Interpret animal behaviors and execute protocols for safe handling of animals.	

CT-AS.06.01.02.a. Explain the implications of animal welfare and animal rights for animal agriculture (A10).*	CT-AS.06.01.02.b. Design programs that assure the welfare of animals and prevent abuse or mistreatment.	CT-AS.06.01.02.c. Implement quality-assurance programs and procedures for animal production.	
CT-AS.06.02. Performance Indicator: Implement procedures to ensure that animal products are safe.			Science: F1 and F5
CT-AS.06.02.01.a. Identify animal production practices that could pose health risks or are considered to pose risks by some.	CT-AS.06.02.01.b. Discuss consumer concerns with animal production practices relative to human health.	CT-AS.06.02.01.c. Implement a program to assure the safety of animal products.	
CT-AS.06.02.02.a. Describe how animal identification systems can track an animal's location, nutrition requirements, production progress and changes in health.	CT-AS.06.02.02.b. Explain why animal trace-back capability, using individual animal and farm identification systems, is important to producers and consumers.	CT-AS.06.02.02.c. Implement an animal and/or premises identification program.	
CT-AS.07. Performance Element: Select animal facilities and equipment that provide for the safe and efficient production, housing and handling of animals.			
CT-AS.07.01. Performance Indicator: Design animal housing, equipment and handling facilities for the major systems of animal production.			Science: C6 and F6 Mathematics:SMP1, SMP5, SMP6
CT-AS.07.01.01.a. Identify optimal living conditions for companion, production and/or lab animals (A12).*	CT-AS.07.01.01.b. Critique designs for an animal facility and prescribe alternative layouts and adjustments for the safe and efficient use of the facility.	CT-AS.07.01.01.c. Design an animal facility, focusing on animal requirements, efficiency, safety and ease of handling.	
CT-AS.07.01.02.a. Identify equipment and handling facilities used in modern animal production.	CT-AS.07.01.02.b. Describe safe handling, shipment and bio-security of companion, production and/or lab animals (A7).*	CT-AS.07.01.02.c. Select equipment and implement animal handling procedures and improvements to enhance production efficiency.	
CT-AS.07.02. Performance Indicator: Comply with government regulations and safety standards for facilities used in animal production.			Science: F5 Mathematics:SMP1, SMP5, SMP6
CT-AS.07.02.01.a. List the general standards (e.g., environmental, zoning, construction) that must be met in facilities for animal production.	CT-AS.07.02.01.b. Evaluate an animal facility to determine if standards have been met.	CT-AS.07.02.01.c. Design a facility that meets standards for the legal, safe, ethical and efficient production of animals.	

CT-AS.08. Performance Element: Analyze <u>environmental factors</u> associated with animal production.			
CT-AS.08.01. Performance Indicator: Reduce the effects of animal production on the environment.			Science: C4 and F4
CT-AS.08.01.01.a. Evaluate the effects of animal agriculture on the environment.	CT-AS.08.01.01.b. Outline methods of reducing the effects of animal agriculture on the environment.	CT-AS.08.01.01.c. Implement measures to reduce the impact of animal agriculture on the environment.	
CT-AS.08.02. Performance Indicator: Evaluate the effects of environmental conditions on animals.			Science: C6 and F4
CT-AS.08.02.01.a. Identify optimal environmental conditions for animals.	CT-AS.08.02.01.b. Describe the effects of environmental conditions on animal populations and performance.	CT-AS.08.02.01.c. Establish and maintain favorable environmental conditions for animal growth and performance.	
CT-AS.09.01. Performance Indicator: Evaluate the significance and implications of changes and trends in the food product and processing industry.			Science: C6 and F4
CT-AS.09.01.01.a Discuss the history and describe and explain the components (e.g., processing, distribution, byproducts) of the food products and processing industry.	CT-AS.09.01.01.b Evaluate changes and trends in the food products and processing industry.	CT-AS.09.01.01.c Predict trends and implications in the food products and processing industry.	
CT-AS.09.01.02.a Identify and explain environmental and safety concerns about the food supply.	CT-AS.09.01.02.b Discuss the issues of safety and environmental concerns about foods and food processing (e.g., Genetically Modified Organisms, microorganisms, contamination, irradiation).	CT-AS.09.01.02.c Determine appropriate industry response to consumer concerns to assure a safe and wholesome food supply.	
CT-AS.10.01. Performance Indicator: Performance Indicator: Implement Hazard Analysis and Critical Control Point (HACCP) procedures to establish operating parameters			Mathematics SMP4
CT-AS.10.01.01.a Describe contamination hazards (physical, chemical and biological) associated with food products and processing.	CT-AS.10.01.01.b Outline procedures to eliminate possible contamination hazards associated with food products and processing.	CT-AS.10.01.01.c Analyze the effectiveness of a food products and processing company's Critical Control Point (CCP) procedures.	
CT-AS.10.01.02.a Identify the seven principles of HACCP.	CT-AS.10.01.02.b Explain the implementation of the seven principles of HACCP.	CT-AS.10.01.02.c Implement an HACCP program for a food products and processing facility.	

CT-AS.10.02. Performance Indicator: Apply safety and sanitation procedures in the handling, processing and storing of food products			Mathematics SMP4
CT-AS.10.02.01.a Explain techniques and procedures for the safe handling of food products.	CT-AS.10.02.01.b Evaluate food product handling procedures.	CT-AS.10.02.01.c Demonstrate approved food product handling techniques.	
CT-AS.10.02.02.a Describe the importance of performing quality-assurance tests on food products.	CT-AS.10.02.02.b Perform quality-assurance tests on food products.	CT-AS.10.02.02.c Interpret quality-assurance test results and apply corrective procedures.	
CT-AS.10.02.03.a Describe the effects food-borne pathogens have on food products and humans.	CT-AS.10.02.03.b Explain the importance of microbiological tests in food product preparation, listing common spoilage and pathogenic microorganisms.	CT-AS.10.02.03.c Conduct and interpret microbiological tests for food-borne pathogens and implement corrective procedures.	
CT-AS.11.01. Performance Indicator: Utilize harvesting, selection and inspection techniques to obtain quality food products for processing			Mathematics SMP4, SMP5, SMP6, SMP7
CT-AS.11.01.01.a Identify quality and yield grades of food products.	CT-AS.11.01.01.b Discuss factors that affect quality and yield grades of food products.	CT-AS.11.01.01.c Assign quality and yield grades to food products according to industry standards.	
CT-AS.11.01.02.a Select raw food products based on yield grades, quality grades and related selection criteria.	CT-AS.11.01.02.b Perform quality-control inspections of raw food products for processing.	CT-AS.11.01.02.c Implement procedures to maintain original food quality and yield.	
CT-AS.11.01.03.a Identify and describe accepted animal treatment and harvesting techniques.	CT-AS.11.01.03.b Compare and contrast accepted animal treatment and harvesting techniques.	CT-AS.11.01.03.c Harvest animals using regulatory agency-approved or industry approved techniques.	
CT-AS.11.01.04.a Describe the importance of premortem and post-mortem inspections of animals for harvest.	CT-AS.11.01.04.b Explain desirable and undesirable characteristics of both premortem and post-mortem animals in relation to the production of food products.	CT-AS.11.01.04.c Conduct pre-mortem and postmortem inspections of animals.	

Aquaculture

Pathway Content Standard: The student will demonstrate competence in the application of scientific principles and techniques to the management of aquaculture.			
Level 1	Level 2	Level 3	National Academic Standard
CT-AQ.01. Performance Element: Examine the components, historical development, global implications and future trends of the aquaculture industry.			
CT-AQ.01.01. Performance Indicator: Evaluate the development and implications of aquatic species origin, domestication and distribution.			Science: C3 Social Studies: 7h
CT-AQ.01.01.01.a. Identify the origin, significance, distribution and commercial importance of aquatic species.	CT-AQ.01.01.01.b. Evaluate and describe characteristics of aquatic animals that developed in response to the aquatic species' environment and led to their commercial use.	CT-AQ.01.01.01.c. Predict adaptations of aquatic species to production practices and environments.	
CT-AQ.01.01.02 Identify invasive species impacting aquaculture production (A9).*			
CT-AQ.01.01.03 Identify and describe aquaculture intensive and extensive enhancement strategies (A3).*			
CT-AQ.02. Performance Element: Classify, evaluate, select, and manage aquatic species based on anatomical and physiological characteristics.			
CT-AQ.02.01. Performance Indicator: Classify animals according to hierarchical taxonomy and agricultural use.			Science: C3 Mathematics: SMP1, SMP4
CT-AQ.02.01.01.a. Explain the importance of the binomial system of nomenclature.	CT-AQ.02.01.01.b. Explain how aquatic species are classified using Linnaeus's taxonomical classification system.	CT-AQ.02.01.01.c. Classify aquatic species according to the taxonomical classification system.	
CT-AQ.02.01.02.a. Identify major aquatic species by common and scientific names.	CT-AQ.02.01.02.b. Compare and contrast the hierarchical classification of the major aquatic species.	CT-AQ.02.01.02.c. Appraise and evaluate the economic value of aquatic species for various applications in the aquaculture industry.	
CT-AQ.02.01.03.a. Classify fresh water and marine species produced for commercial and recreational purposes (A2).*			

CT-AQ.02.02. Performance Indicator: Apply principles of comparative anatomy and physiology to uses within various aquatic species.			Science: C1, C5 and F2
CT-AQ.02.02.01.a. Identify morphological features of finfish and shellfish (A10).*	CT-AQ.02.02.01.b. Compare and contrast aquatic species cells, tissues, organs and body systems.	CT-AQ.02.02.01.c. Explain how the components and systems of aquatic species anatomy and physiology relate to the production and use of aquatic species.	
CT-AQ.02.02.02.a. Diagram a typical aquatic species cell and identify the organelles.	CT-AQ.02.02.02.b. Describe the functions of aquatic species cell structures.	CT-AQ.02.02.02.c. Describe the molecular makeup of aquatic species cells and its importance in aquaculture production and management.	
CT-AQ.02.02.03.a. Describe the basic functions of aquatic species cells in growth and reproduction.	CT-AQ.02.02.03.b. Detail the processes of meiosis and mitosis in aquatic species growth, development, health and reproduction.	CT-AQ.02.02.03.c. Explain the application of the processes of meiosis and mitosis to aquatic species growth, development, health and reproduction.	
CT-AQ.02.02.04.a. Describe the properties, locations, functions and types of aquatic species tissues.	CT-AQ.02.02.04.b. Explain the relationship of aquatic species tissues to growth, performance and health.	CT-AQ.02.02.04.c. Explain the importance and uses made of aquatic species tissues in the aquaculture industry.	
CT-AQ.02.02.05.a. Describe the properties, locations, functions and types of aquatic species organs.	CT-AQ.02.02.05.b. Compare and contrast organ types and functions among aquatic species.	CT-AQ.02.02.05.c. Relate the importance of aquatic species organs to the health, growth and reproduction of animals.	
CT-AQ.02.02.06.a. Describe the functions of the aquatic species body systems and system components.	CT-AQ.02.02.06.b. Compare and contrast body systems and system adaptations between aquatic species.	AS.02.02.06.c. Explain the impact of aquatic species body systems on performance, health, growth and reproduction.	
CT-AQ.02.03. Performance Indicator: Select aquatic species for specific purposes and maximum performance based on anatomy and physiology.			Science: C5 Mathematics SMP4
CT-AQ.02.03.01.a. Identify ways aquatic species' health can be affected by anatomical and physiological disorders.	CT-AQ.02.03.01.b. Compare and contrast desirable anatomical and physiological characteristics of aquatic plants and animals within and between species.	CT-AQ.02.03.01.c. Evaluate and select aquatic species to maximize performance based on anatomical and physiological characteristics that affect health, growth and reproduction.	
CT-AQ.02.03.02.a. Create a program to develop an aquatic species to its highest potential performance.	CT-AQ.02.03.02.b. Assess an aquatic species to determine if it has reached its optimal performance level based on anatomical and physiological characteristics.	CT-AQ.02.03.02.c. Develop efficient procedures to produce consistently high-quality aquatic species well suited for their intended purposes.	

CT-AQ.02.03.03.a. Understand the lifecycle of aquatic animals (A11).*			
CT-AQ.03. Performance Element: Provide for the proper health care of aquatic species.			
CT-AQ.03.01. Performance Indicator: Prescribe and implement a prevention and treatment program for aquatic species diseases, parasites and other disorders.			Science: C4, F1 and F5 Mathematics: SMP5, SMP6
CT-AQ.03.01.01.a. Explain methods of determining aquatic species health and disorders.	CT-AQ.03.01.01.b. Identify protocols needed to diagnose, treat and prevent basic aquatic diseases to maintain healthy populations (A7).*	CT-AQ.03.01.01.c. Perform diagnostic tests to detect health problems in aquatic species.	
CT-AQ.03.01.02.a. Identify common diseases, parasites and physiological disorders that affect aquatic species.	CT-AQ.03.01.02.b. Diagnose illnesses and disorders of aquatic species based on symptoms and problems caused by diseases, parasites and physiological disorders.	CT-AQ.03.01.02.c. Treat common diseases, parasites and physiological disorders of aquatic species.	
CT-AQ.03.01.03.a. Explain characteristics of causative agents and vectors of diseases and disorders in aquatic species.	CT-AQ.03.01.03.b. Evaluate the health and productivity of fish and shellfish populations (A5).*	CT-AQ.03.01.03.c. Design and implement a health maintenance and disease and disorder prevention plan for aquatic species in their natural and/or confined environments.	
CT-AQ.03.01.04.a. Explain the clinical significance of common considerations in veterinary treatments, such as aseptic techniques.	CT-AQ.03.01.04.b. Prepare aquatic species, facilities and equipment for surgical and nonsurgical veterinary treatments and procedures.	CT-AQ.03.01.04.c. Perform surgical and nonsurgical veterinary treatments and procedures in aquatic animal health care.	
CT-AQ.03.01.05.a. Identify and describe zoonotic diseases.	CT-AQ.03.01.05.b. Explain the health risk of zoonotic diseases to humans and their historical significance and future implications.	CT-AQ.03.01.05.c. Implement zoonotic disease prevention methods and procedures for the safe handling and treatment of aquatic animals.	
CT-AQ.03.02. Performance Indicator: Provide for the biosecurity of aquatic species and production facilities.			Science: F5 and F6 Social Studies: 9d
CT-AQ.03.02.01.a. Explain the importance of biosecurity to the aquaculture industry.	CT-AQ.03.02.01.b. Discuss procedures at the local, state and national levels to ensure biosecurity of the aquaculture industry.	CT-AQ.03.02.01.c. Implement a biosecurity plan for an aquaculture production operation.	
CT-AQ.04. Performance Element: Apply principles of nutrition to ensure the proper growth, development, reproduction and economic production of aquatic animals.			
CT-AQ.04.01. Performance Indicator: Formulate feed rations to provide for the nutritional needs of animals.			Math: 1C and 6B Science: A4 and C5
CT-AQ.04.01.01.a. Compare and contrast common types of feedstuffs and the roles they play in the diets of aquatic animals.	CT-AQ.04.01.01.b. Determine the relative nutritional value of feedstuffs by evaluating their general quality and condition.	CT-AQ.11.01.01.c. Select appropriate feedstuffs for aquatic animals based on factors such as economics, digestive system and nutritional	

		needs.	
CT-AQ.04.01.02.a. Identify nutrients and nutritional strategies for finfish and shellfish production (A15).*	CT-AQ.04.01.02.b. Appraise the adequacy of feed rations using data from the analysis of feedstuffs, aquatic animal requirements and performance.	CT-AQ.04.01.02.c. Formulate aquatic animal feeds based on nutritional requirements, using feed ingredients for maximum nutrition and optimal economic production.	
CT-AQ.05. Performance Element: Evaluate and select aquatic species based on scientific principles of aqua cultural production.			
CT-AQ.05.01. Performance Indicator: Evaluate the male and female reproductive systems in selecting aquatic species.			Science: C1 and C3
CT-AQ.05.01.01.a. Explain the male and female reproductive organs of the major aquatic animal species.	CT-AQ.05.01.01.b. Describe the functions of major organs in the male and female reproductive systems.	CT-AQ.05.01.01.c. Select breeding species based on characteristics of the reproductive organs.	
CT-AQ.05.02. Performance Indicator: Evaluate aquatic animals for breeding readiness and soundness.			Science: C6
CT-AQ.05.02.01.a. Explain how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female aquatic animals.	CT-AQ.05.02.01.b. Summarize factors that lead to reproductive maturity.	CT-AQ.05.02.01.c. Evaluate and select aquatic animals for reproductive readiness.	
CT-AQ.05.02.02.a. Discuss the importance of efficient and economic reproduction in aquatic animals.	CT-AQ.05.02.02.b. Evaluate reproductive problems that occur in aquatic animals.	CT-AQ.05.02.02.c. Treat or cull aquatic animals with reproductive problems.	
CT-AQ.05.03. Performance Indicator: Apply scientific principles in the selection and breeding of aquatic species.			Math: 6C Science: A4, C2 and E2
CT-AQ.05.03.01.a. Explain genetic inheritance in aquatic species.	CT-AQ.05.03.01.b. Explain the advantages of using genetically superior species in the production of aquatic plants and animals and aqua cultural products.	CT-AQ.05.03.01.c. Select a breeding system based on the principles of genetics.	
CT-AQ.05.03.02.a. Define natural and artificial breeding methods.	CT-AQ.05.03.02.b. Explain the processes of natural and artificial breeding methods.	CT-AQ.05.03.02.c. Select aquatic species breeding methods based on reproductive and economic efficiency.	
CT-AQ.05.03.03.a. Explain the use of quantitative breeding values (e.g., EPDs) in the selection of genetically superior breeding stock.	CT-AQ.05.03.03.b. Compare and contrast quantitative breeding value differences between genetically superior aquatic species and aquatic species of average genetic value.	CT-AQ.05.03.03.c. Select aquatic species based on quantitative breeding values for specific characteristics.	

CT-AQ.06. Performance Element: Prepare and implement aquatic animal handling procedures for the safety of animals, producers and consumers of aqua cultural products.			
CT-AQ.06.01. Performance Indicator: Demonstrate safe aquatic animal handling and management techniques.			Science: C6
CT-AQ.06.01.01.a. Discuss the dangers involved in working with aquatic animals.	CT-AQ.06.01.01.b. Outline safety procedures for working with aquatic animals by species.	CT-AQ.06.01.01.c. Interpret animal behaviors and execute protocols for safe handling of aquatic animals.	
CT-AQ.06.01.02.a. Explain the implications of animal welfare and animal rights for aquaculture.	CT-AQ.06.01.02.b. Design programs that assure the welfare of aquatic animals and prevent abuse or mistreatment.	CT-AQ.06.01.02.c. Implement quality-assurance programs and procedures for aquatic animal production.	
CT-AQ.06.02. Performance Indicator: Implement procedures to ensure that aquaculture products are safe.			Science: F1 and F5
CT-AQ.06.02.01.a Identify aquatic animal production practices that could pose health risks or are considered to pose risks by some.	CT-AQ.06.02.01.b. Discuss consumer concerns with aquatic animal production practices relative to human health.	CT-AQ.06.02.01.c. Implement a program to assure the safety of animal products.	
CT-AQ.06.02.02.a. Describe how aquatic animal identification systems can track an animal's location, nutrition requirements, production progress and changes in health.	CT-AQ.06.02.02.b. Explain why aquatic animal trace-back capability, using individual aquatic animal and aquaculture facility identification systems, is important to producers and consumers.	CT-AQ.06.02.02.c. Implement an aquatic animal and/or premises identification program.	
CT-AQ.07. Performance Element: Select aquaculture facilities and equipment that provide for the safe and efficient production, housing and handling of aquatic species.			
CT-AQ.07.01. Performance Indicator: Design aquatic species housing, equipment and handling facilities for the major systems of aquaculture production.			Science: C6 and F6 Mathematics SMP1, SMP2, SMP3, SMP4, SMP5
CT-AQ.07.01.01.a. Demonstrate knowledge of the design and management of aquaculture systems (A1).*	CT-AQ.07.01.01.b. Critique designs for an aquaculture facility and prescribe alternative layouts and adjustments for the safe and efficient use of the facility.	CT-AQ.07.01.01.c. Design an aquatic facility, focusing on aquatic species requirements, efficiency, safety and ease of handling.	
CT-AQ.07.01.02.a. Identify equipment and handling facilities used in modern aquaculture production.	CT-AQ.07.01.02.b. Explain how modern equipment and handling facilities enhance the safe and economic production of aquatic species.	CT-AQ.07.01.02.c. Select equipment and implement handling procedures and improvements to enhance production efficiency of aquatic species.	

CT-AQ.07.01.03.a Identify the operating components and principles of filtration and aeration (A12).*	CT-AQ.07.01.03.b. Explain the basic electrical, plumbing and mechanical components of aquaponic systems (A13).*		
CT-AQ.07.02. Performance Indicator: Comply with government regulations and safety standards for facilities used in aquaculture production.			Science: F5
CT-AQ.07.02.01.a. List the general standards (e.g., environmental, zoning, construction) that must be met in facilities for aquaculture production.	CT-AQ.07.02.01.b. Evaluate an aquaculture facility to determine if standards have been met.	CT-AQ.07.02.01.c. Design a facility that meets standards for the legal, safe, ethical and efficient production of aquatic species.	
CT-AQ.07.02.02.a. Interpret laws related to aquaculture management and production (A16).*			
CT-AQ.08. Performance Element: Analyze environmental factors associated with aquaculture.			
CT-AQ.08.01. Performance Indicator: Reduce the effects of aquaculture on the environment.			Science: C4 and F4
CT-AQ.08.01.01.a. Evaluate the effects of aquaculture on the environment.	CT-AQ.08.01.01.b. Outline methods of reducing the effects of aquaculture on the environment.	CT-AQ.08.01.01.c. Apply sustainable principles and practices to aquaculture production and management (A4).*	
CT-AQ.08.02. Performance Indicator: Evaluate the effects of environmental conditions on aquatic species.			Science: C6 and F4
CT-AQ.15.02.01.a. Identify optimal environmental conditions for aquatic species.	CT-AQ.15.02.01.b. Describe the effects of environmental conditions on aquatic species populations and performance.	CT-AQ.08.02.01.c. Establish and maintain favorable environmental conditions for aquatic species growth and performance.	
CT-AQ.15.02.01.a. Apply environmental and ecological concepts to aquaculture production (A6).*			
AQ.09. Performance Element: Recognize the historical, social, cultural and potential applications of biotechnology.			
CT-AQ.09.01. Performance Indicator: Distinguish major innovators, historical developments and potential applications of biotechnology in aquaculture.			Science: E2, F6 and G3 Language Arts: 8 Social Studies: 2b, 8a, 8c and 8e
CT-AQ.16.01.01.a. Define biotechnology and explore the historical impact it has had on agriculture.	CT-AQ.09.01.01.b. Create a timeline and use it to explain the developmental progression of biotechnology.	CT-AQ.09.01.01.c. Research and report on the major innovators and milestones in the development of biotechnology.	

CT-AQ.09.01.02.a. Investigate current applications of biotechnology in aquaculture.	CT-AQ.09.01.02.b. Research and report on current work being done in aqua cultural biotechnology.	CT-AQ.09.01.02.c. Analyze the scope and impact of aqua cultural biotechnology in today's global society.	Math: CCSS: S-IC.6; SMP2, SMP4
CT-AQ.09.01.03.a. Examine potential future applications of biotechnology in aquaculture and compare them with alternative approaches to improving aquaculture.	CT-AQ.09.01.03.b. Research and report on emerging problems and issues associated with aqua cultural biotechnology.	CT-AQ.09.01.03.c. Assess the future impact aqua cultural biotechnology could have on world populations.	
CT-AQ.09.02. Performance Indicator: Determine regulatory issues and identify agencies associated with biotechnology.			Science: A1 Language Arts: 4 and 7 Social Studies: 10c
CT-AQ.09.02.01.a. Describe the role of agencies that regulate biotechnology.	CT-AQ.09.02.01.b. Interpret the major regulatory issues related to biotechnology.	CT-AQ.09.02.01.c. Research, evaluate and articulate a major regulatory issue pertaining to biotechnology.	
CT-AQ.09.03. Performance Indicator: Analyze the ethical, legal, social and cultural issues relating to biotechnology.			Science: A4 Language Arts: 4, 7 and 8 Social Studies: 10c and 10i
CT-AQ.09.03.01.a. Explore ethical, legal and social biotechnology issues	CT-AQ.09.03.01.b. Evaluate the benefits and risks associated with biotechnology.	CT-AQ.09.03.01.c. Research, evaluate and articulate the implications of an ethical, legal, social or cultural biotechnology issue.	
CT-AQ.09.03.02.a. Explore the emergence, evolution and implications of bioethics	CT-AQ.09.03.02.b. Examine an ethical dilemma associated with biotechnology by identifying its components.	CT-AQ.09.03.02.c. Research and debate an ethical issue associated with biotechnology.	
CT-AQ.09.03.03.a. Explain the meaning of intellectual properties as related to biotechnology.	CT-AQ.09.03.03.b. Examine intellectual properties associated with biotechnology by defining their components.	CT-AQ.09.03.03.c. Analyze an intellectual property issue associated with bioethics.	
CT-AQ.10. Performance Element: Demonstrate laboratory skills as applied to biotechnology.			
CT-AQ.10.01. Performance Indicator: Maintain and interpret biotechnology laboratory records.			Math: CCSS: S-IC.6 and 5B Science: A2 and A6 Language Arts: 5 and 7
CT-AQ.10.01.01.a. Maintain a biotechnology laboratory notebook.	CT-AQ.10.01.01.b. Analyze strengths of the research based on data and procedures, and propose future investigation.	CT-AQ.10.01.01.c. Utilize external reviews and compares them to research conducted.	

CT-AQ.10.02. Performance Indicator: Operate biotechnology laboratory equipment according to standard procedures.			Math: CCSS: N-Q3 Science: A3
CT-AQ.10.02.01.a. Operate basic laboratory equipment and measurement devices.	CT-AQ.10.02.01.b. Operate advanced laboratory equipment and measurement devices.	CT-AQ.10.02.01.c. Calibrate laboratory equipment and conduct instrument qualification tests.	
CT-AQ.10.03. Performance Indicator: Demonstrate proper laboratory procedures using biological materials.			Science: A2, A3 and E1
CT-AQ.10.03.01.a. Demonstrate basic aseptic techniques in the biotechnology laboratory.	CT-AQ.10.03.01.b. Demonstrate advanced aseptic techniques in the biotechnology laboratory.	CT-AQ.10.03.01.c. Perform bioassays and experiments under aseptic conditions.	
CT-AQ.10.03.02.a. Perform procedures with biological materials according to directions.	CT-AQ.10.03.02.b. Select an appropriate standard operating procedure for working with biological materials.	CT-AQ.10.03.02.c. Develop a standard operating procedure for a biological process.	
CT-AQ.10.04. Performance Indicator: Perform microbiology, molecular biology, enzymology and immunology procedures.			Math: CCSS: N-Q2 Science: A1, A2, A3, B2, C2, C6 and E2 Language Arts: 4
CT-AQ.10.04.01.a. Differentiate the types of organisms and demonstrate how to handle them safely.	CT-AQ.10.04.01.b. Isolate, maintain, quantify and store cell cultures.	CT-AQ.10.04.01.c. Characterize the physical, chemical and biological properties of microbes.	
CT-AQ.10.04.02.a. Explain the structures of DNA and RNA and how genotype influences phenotype.	CT-AQ.10.04.02.b. Explain the molecular basis for heredity and the tools and techniques used in DNA and RNA manipulations.	CT-AQ.10.04.02.c. Analyze factors that influence gene expression.	
CT-AQ.10.04.03.a. Extract and purify DNA and RNA.	CT-AQ.10.04.03.b. Perform electrophoretic techniques and interpret electrophoresis fragmentation patterns.	CT-AQ.10.04.03.c. Perform DNA and RNA manipulations, such as cloning/sub cloning, blotting, sequencing and amplification.	
CT-AQ.10.04.04.a. Perform simple enzyme activity assays to detect proteins.	CT-AQ.10.04.04.b. Perform protein separation techniques and interpret the results.	CT-AQ.10.04.04.c. Characterize the biochemical properties of proteins.	
CT-AQ.10.04.05.a. Describe how antibodies are formed and how they can be used in biotechnology applications.	CT-AQ.10.04.05.b. Conduct an Enzyme-Linked Immunosorbent Assay (ELISA).	CT-AQ.10.04.05.c. Use antibodies to detect and quantify antigens.	

CT-AQ.10.04.06.a. Explain reasons for detecting microbes and identify sources of microbes	CT-AQ.10.04.06.b. Research and describe the use of biotechnology to detect microbes.	CT-AQ.10.04.06.c. Design and perform an assay to detect a target microorganism in food, water or the environment.	
CT-AQ.11. Performance Element: Demonstrate the application of biotechnology to aquaculture.			
CT-AQ.11.01. Performance Indicator: Evaluate the application of genetic engineering to improve products of aquaculture.			Math: CCSS: N-Q2; N-Q3; SMP4, SMP5 Science: A2, C2, E2 and F4 Language Arts: 7 and 8
CT-AQ.11.01.01.a. Explain biological, social, agronomic and economic reasons for genetic modification of eukaryotes.	CT-AQ.11.01.01.b. Diagram the processes and describe the techniques used to produce transgenic eukaryotes.	CT-AQ.11.01.01.c. Design and conduct an experiment to evaluate an existing transgenic eukaryote.	
CT-AQ.11.01.02.a. Describe enzymes, the changes they cause in foods and the physical and chemical parameters that affect enzymatic reactions.	CT-AQ.11.01.02.b. Describe processes by which enzymes are produced through biotechnology.	CT-AQ.11.01.02.c. Use biotechnology tools or microbial strain selection to improve or discover enzymes for use in food processing.	
CT-AQ.11.01.03.a. Compare and contrast the use of natural organisms and genetically engineered organisms in the treatment of wastes	CT-AQ.11.01.03.b. Diagram the processes by which organisms are genetically engineered for waste treatment.	CT-AQ.11.01.03.c. Monitor and evaluate the treatment of a waste product using a genetically engineered organism.	
CT-AQ.11.01.04.a. Describe the benefits and risks associated with the use of biotechnology to increase productivity and improve quality of aquatic species.	CT-AQ.11.01.04.b. Investigate and report on genetic engineering procedures used in the production of aquatic species.	CT-AQ.11.01.04.c. Conduct field or clinical trials for genetically modified aquatic species.	
CT-AQ.11.02. Performance Indicator: Perform biotechnology processes used in aquaculture.			Science: B3, C5, D1 and E2 Language Arts: 4
CT-AQ.11.02.01.a. Explain the process of transesterification.	CT-AQ.11.02.01.b. Diagram the process used in producing biodiesel from biomass	CT-AQ.11.02.01.c. Produce biodiesel and co-products from biomass.	
CT-AQ.11.03. Performance Indicator: Use biotechnology to monitor and evaluate procedures performed in AFNR systems.			Science: A2, A3, C4, C6 and F5 Mathematics SMP4, SMP5 Language Arts: 7 and 8
CT-AQ.11.03.01.a. Describe the selective plant breeding process.	CT-AQ.11.03.01.b. Select biotechnology tools used to monitor and direct plant breeding.	CT-AQ.11.03.01.c. Design and conduct an experiment using biotechnology tools to evaluate selectively bred plants.	

CT-AQ.11.03.02.a. Describe biotechnology processes applicable to aquatic species health.	CT-AQ.11.03.02.b. Assess the benefits, risks and opportunities associated with using biotechnology to promote animal health.	CT-AQ.11.03.02.c. Design animal-care protocols that use biotechnology tools to ethically monitor and promote aquaculture.	
CT-AQ.11.03.03.a. Give examples of instances in which bioremediation can be applied to clean up environmental contaminants.	CT-AQ.11.03.03.b. Describe the use of biotechnology in bioremediation.	CT-AQ.11.03.03.c. Monitor and evaluate the effectiveness of bioremediation efforts by participating in a bioremediation project.	
CT-AQ.11.03.04.a. Explain the use of microorganisms in biological waste management.	CT-AQ.11.03.04.b. Describe the processes involved in biotreatment of biological wastes.	CT-AQ.11.03.04.c. Monitor and evaluate the treatment of biological wastes with microorganisms.	
CT-AQ.11.03.05.a. Explain the role of microorganisms in aqua cultural chemical waste treatment.	CT-AQ.11.03.05.b. Interpret the processes involved in biotreatment of aqua cultural chemical wastes	CT-AQ.11.03.05.c. Monitor and evaluate the treatment of aqua cultural chemical wastes with microorganisms	
CT-AQ.11.03.06.a. Explain the global importance of biodiversity.	CT-AQ.11.03.06.b. Select biotechnology tools used to measure biodiversity.	CT-AQ.11.03.06.c. Use biotechnology tools to measure biodiversity in a population.	
CT-AQ.11.03.07.a. Explain the consequences of aqua cultural practices on wild populations.	CT-AQ.11.03.07.b. Explain how biotechnology tools can be used to monitor the effects of aqua cultural practices on wild populations	CT-AQ.11.03.07.c. Analyze the implications of biotechnology on wild species.	
CT-AQ.11.03.08.a. Explain biomass and sources of biomass.	CT-AQ.11.03.08.b. Assess the characteristics of biomass that make it useful for biofuels production.	CT-AQ.11.03.08.c. Evaluate the technologies used to create biofuels from biomass.	
CT-AQ.12. Performance Element: Demonstrate the importance of water quality in aquaculture systems.			
CT-AQ.21.01. Performance Indicator: Apply hydrology principles to aquaculture.			Science: D2 Mathematics SMP2, SMP4, SMP5
CT-AQ.12.01.01.a. Describe the world's water supplies and discusses the many uses of water.	CT-AQ.12.01.01.b. Describe characteristics of water that influence the biosphere and sustain life.	CT-AQ.12.01.01.c. Research and debate one or more current environmental issues associated with the supplies of groundwater and surface water.	

CT-AQ.12.01.02.a. Demonstrate knowledge of hydrogeology by differentiating between groundwater and surface water.	CT-AQ.12.01.02.b. Describe interactions between groundwater and surface water.	CT-AQ.12.01.02.c. Use groundwater-flow equations and Darcy's Law to explain how geology and meteorology affect groundwater and groundwater flow.	
CT-AQ.12.01.03.a. Define groundwater potential.	CT-AQ.12.01.03.b. Identify differences in groundwater potential.	CT-AQ.12.01.03.c. Delineate groundwater potential zones.	
CT-AQ.12.01.04.a. Identify environmental hazards associated with groundwater supplies.	CT-AQ.21.03.04.b. Describe precautions taken to prevent/reduce contamination of groundwater supplies.	CT-AQ.12.01.04.c. Test and document the quality of groundwater supplies.	
CT-AQ.12.01.04.a. Identify water quality factors affecting aquaculture production (A14).*			
CT-AQ.12.02. Performance Indicator: Apply principles of wastewater treatment to manage wastewater disposal in keeping with rules and regulations.			Science: F4 and F5 Mathematics: SMP4, SMP5
CT-AQ.12.02.01.a. Define wastewater	CT-AQ.12.02.01.b. Diagram the steps in wastewater treatment.	CT-AQ.12.02.01.c. Demonstrate the use of water-testing instruments and water-treatment equipment to treat wastewater.	
CT-AQ.12.03. Performance Indicator: Manage hazardous materials to assure a safe facility and to comply with applicable regulations.			Science: F4 and F5
CT.12.03.01.a. Identify types of hazardous materials.	CT-AQ.12.03.01.b. Describe risks related to hazardous materials and describe health and safety practices to reduce risks from hazardous materials.	CT-AQ.12.03.01.c. Describe the procedures for the treatment and disposal of hazardous materials and hazardous waste.	
CT-AQ.13. Performance Element: Select vehicles, tools and equipment that provide for the needs of efficient manufacture and used in aquaculture.			
CT-AQ.13.01. Performance Indicator: Design vehicles, vessels and equipment for aquaculture production.			Science: C6 and F6 Mathematics: SMP1, SMP2, SMP3,SMP4,SMP5
CT-AQ.13.01.01.a. Identify vehicles, tools and equipment used for aquaculture.	CT-AQ.13.01.01.b. Critique designs for vehicles, tools and equipment used in aquaculture.	CT-AQ.13.01.01.c. Design vehicles, vessels, tools and equipment used in aquaculture.	
CT-AQ.13.01.02.a. Repair and maintain vehicles, tools and equipment.	CT-AQ.13.01.02.b. Determine costs and expenses of aquaculture vehicles, tools and equipment.	CT-AQ.13.01.02.c. Build industry appropriate marine vehicles and ancillary infrastructure based on industry standards.	

CT-AQ.13.01.03.a. Identify principles, equipment and procedures related to the production, harvesting and processing of aquaculture products and species (A8).*			
CT-AQ.13.02. Performance Indicator: Demonstrate the ability to perform safely with aquaculture production vehicles, tools and equipment.			Science: C6 and F4 Mathematics: SMP1, SMP2, SMP3,SMP4,SMP5
CT-AQ.13.02.01.a. List the general standards (e.g., environmental, USCG, DEP, ABYC) specific to aquaculture.	CT-AQ.13.02.01.b. Evaluate aquaculture vehicles, tools and equipment to determine if standards have been met.	CT-AQ.13.02.01.c. Design vehicles, tools and equipment that meets standards for aquaculture.	
CT-AQ.13.02.02.a. Define proper vocabulary necessary for safe operation of marine vehicles, tools and equipment used in aquaculture.	CT-AQ.13.02.02.b. Identify all aspects of vehicles, tools and equipment in aquaculture.	CT-AQ.13.02.0.c. Operate, maintain and repair vehicles, tools and equipment in aquaculture.	
CT.13.03.03.a.Understand principles of boating safety and handling (A17).*			

Natural Resources Systems

Pathway Content Standard: The student will demonstrate competence in the application of scientific principles and techniques to the management of natural resources.

Level 1	Level 2	Level 3	National Academic Standard
NRS.01. Performance Element: Explain interrelationships between <u>natural resources and humans</u> necessary to conduct management activities in natural environments.			
NRS.01.01. Performance Indicator: Classify measure and survey natural resources to create planning data.			Math: CCSS: S-IC, SMP4 Science: C4 and F3 Social Studies: 3h and 3k
CT-NRS.01.01.01.a. Define ecosystem and related terms.	CT-NRS.01.01.01.b. Describe the interdependence of organisms within an ecosystem.	CT-NRS.01.01.01.c. Conduct a field studies of an ecosystem and record and document observations of species interactions.	
CT-NRS.01.01.02.a. Describe morphological characteristics used to identify trees and other woody plants, herbaceous plants, wildlife and aquatic species native to New England.	CT-NRS.01.01.02.b. Identify trees and other woody plants, herbaceous plants, wildlife, and aquatic species native to New England.	CT-NRS.01.01.02.c. Conduct a field inventory of trees and other woody plants, herbaceous plants, wildlife, and aquatic species, record, native to New England, and analyze data to create a management plan.	Math: CCSS: F-IF.7; SMP\$, SMP5
CT-NRS.01.01.03.a. Demonstrate techniques used to identify rock, mineral and soil types.	CT-NRS.01.01.03.b. Identify rock, mineral and soil types.	CT-NRS.01.01.03.c. Conduct a field inventory of rock, mineral and soil types, and record and document findings.	
CT-NRS.01.01.03.a Identify native New England tree species and their products (A.3).*	CT-NRS.01.01.03.b Understand the procedures for conducting resource inventories and population studies (A.2).*		
CT- NRS.02. Performance Element: Apply <u>scientific principles</u> to natural resource management activities.			
CT-NRS.02.01. Performance Indicator: Develop a safety plan for work with natural resources.			Science: F3 and F5 Language Arts: 8
CT-NRS.02.01.01.a. Identify hazards associated with the outdoor environment.	CT-NRS.02.01.01.b. Demonstrate safety practices when working in an outdoor environment.	CT-NRS.02.01.01.c. Demonstrate appropriate responses to accidents and injuries that occur in an outdoor environment.	
CT-NRS.02.01.02.a. Recognize biohazards associated with natural resources.	CT-NRS.02.01.02.b. Use appropriate techniques and equipment when working with biohazards.	CT-NRS.02.01.02.c. Demonstrate appropriate responses for disasters involving bio hazardous materials.	

CT-NRS.02.02. Performance Indicator: Demonstrate cartographic skills to aid in developing, implementing and evaluating natural resource management plans.			Math: CCSS: S-IC Science: A3 and F2 Social Studies: 3b and 3c fertilization
CT-NRS.02.02.01.a. Demonstrate how to use maps to identify directions and features, calculate actual distance and determine the elevations of points.	CT-NRS.02.02.01.b. Locate natural resources using a land survey and geographic coordinate system.	CT-NRS.02.02.01.c. Employ Global Positioning System and Geographic Information Systems technologies to inventory features in natural resource management.	
CT-NR.02.02.02.a Understand drawings, prints, maps and navigational technology used in natural resources (A.6).*	CT-NR.02.02.02.b Follow a drawing or print to carry out a task	CT-NR.02.02.02.c Create drawings and prints to carry out a task.	
CT-NRS.02.03. Performance Indicator: Demonstrate natural resource enhancement techniques.			Math: CSS: N-Q; S-IC Science: F3 Social Studies: 3g and 3k
CT-NRS.02.03.01.a. Identify the different kinds of streams.	CT-NRS.02.03.01.b. Identify indicators of the biological health of a stream.	CT-NRS.02.03.01.c. Create and implement a stream enhancement plan.	
CT-NRS.02.03.02.a. Identify characteristics of a healthy forest.	CT-NRS.02.03.02.b. Identify ways in which forest stands may be improved.	CT-NRS.02.03.02.c. Formulate a timber stand improvement plan for a forest.	
CT-NRS.02.03.03.a. Identify characteristics of a healthy wildlife habitat.	CT-NRS.02.03.03.b. Identify methods of wildlife habitat improvement.	CT-NRS.03.04.03.c. Conduct a survey of a habitat and devise a comprehensive improvement plan.	
CT-NRS.02.03.04.a. Identify natural resource characteristics desirable for recreational purposes.	CT-NRS.02.03.04.b. Identify natural resource management techniques for improving recreation opportunities.	CT-NRS.02.03.04.c. Evaluate the impact of recreational activities on natural resources and create an improvement plan.	
CT-NRS.02.03.05.a. Identify characteristics of healthy marine and coastal natural resources.	CT-NRS.02.03.05.b. Identify methods to improve marine and coastal natural resources.	CT-NRS.02.03.05.c. Assess marine and coastal natural resources and prepare an improvement plan.	
CT-NRS.02.04. Performance Indicator: Interpret laws related to natural resource management and protection.			Science: F3 Language Arts: 7 Social Studies: 6c
CT-NRS.02.04.01a Understand environmental protection laws and policy related to natural resources management and protection. (A.10).*	CT-NRS.02.04.01.b. Identify the purposes of laws and policies associated with natural resource systems.	CT-NRS.02.04.01.c. Abide by specific laws and policies pertaining to natural resource systems.	
CT-NRS.02.04.02.a. Define mitigation.	CT-NRS.02.04.02.b. Identify issues involving mitigation of natural resources.	CT-NRS.02.04.02.c. Demonstrate mitigation techniques for natural resources.	

CT-NRS.02.05. Performance Indicator: Manage hazardous materials to assure a safe facility and to comply with applicable regulations.			Science: F4 and F5
CT-NRS.02.05.01.a. Identify types of hazardous materials.	CT-NRS.02.05.01.b. Describe risks related to hazardous materials and describe health and safety practices to reduce risks from hazardous materials.	CT-NRS.02.05.01.c. Describe the procedures for the treatment and disposal of hazardous materials and hazardous waste.	
CT-NRS.02.06. Performance Indicator: Apply ecological concepts and principles to natural resource systems.			Science: D2 and F3 Mathematics: SMP4,SMP5 Social Studies: 3b, 3f and 3h
CT-NRS.02.06.01.a. Identify biogeochemical cycles.	CT-NRS.02.06.01.b. Diagram biogeochemical cycles and explains the processes.	CT-NRS.02.06.01.c. Determine the human influence on biogeochemical cycles.	
CT-NRS.02.06.02.a. Describe properties of watersheds and identify the boundaries of local watersheds.	CT-NRS.02.06.02.b. Relate the function of watersheds to natural resources.	CT-NRS.02.06.02.c. Analyze ecosystem functions of a watershed.	
CT-NRS.02.06.03.a. Compare and contrast groundwater and surface-water flow.	CT-NRS.02.06.03.b. Explain stream hydrology and structure, and determine the different classes of streams.	CT-NRS.02.06.03.c. Classify and predict the behavior of local streams.	
CT-NRS.02.06.04.a. Define riparian zones and riparian buffers, and explain their functions.	CT-NRS.02.06.04.b. Identify techniques used in the creation, enhancement and management of riparian zones and riparian buffers.	CT-NRS.02.06.04.c. Create, enhance and manage riparian zones and riparian buffers.	
CT-NRS.02.06.05.a. Describe the processes associated with ecological succession.	CT-NRS.02.06.05.b. Give examples of primary-succession and secondary-succession species in a community of organisms.	CT-NRS.02.06.05.c. Conduct a field studies to determine the stages of ecological succession in a community of organisms.	
CT-NRS.02.06.06.a. Explain population ecology, population density and population dispersion.	CT-NRS.02.06.06.b. Discuss factors that influence population density and population dispersion.	CT-NRS.02.06.06.c. Create and implement a management plan based on a population study for a community of organisms.	
CT-NRS.02.06.07.a. Identify invasive species and their impact on natural resources in the northeast (A7).*	CT-NRS.02.06.07.b. Discuss factors that influence the establishment, spread and impact of invasive species.	CT-NRS.02.06.07.c. Develop and implement a plan to reduce the impact of invasive species on natural resources.	
CT-NRS.02.06.08.a. Describe sources of pollution and delineate between point and nonpoint source pollution.	CT-NRS.02.06.08.b. Describe the impact of pollution on natural resources.	CT-NRS.02.06.08.c. Create and implement a plan to prevent or limit the effects of pollution on natural resources.	

CT-NRS.02.06.09.a. Describe climatic factors that influence natural resources.	CT-NRS.02.06.09.b. Describe the impact climate has on natural resources.	CT-NRS.02.06.09.c. Monitor the effects of climate on plants and wildlife.	
CT-NRS.03. Performance Element: Apply knowledge of natural resources to <u>production and processing</u> industries.			
CT-NRS.03.01. Performance Indicator: Produce, harvest, process and use natural resource products.			Science: F3 Mathematics: SMP4, SMP5, SMP6
CT-NRS.03.01.01.a. Describe forest harvesting methods.	CT-NRS.03.01.01.b. Determine when to harvest forest products.	CT-NRS.03.01.01.c. Harvest forest products according to principles of sustainable forest management.	
CT-NRS.03.01.02.a Identify native New England tree species and their products (A.3).*	CT-NRS.03.01.02.b. Describe processing of forest products.	CT-NRS.03.01.02.c. Process forest products.	
CT-NRS.03.01.03.a. Identify wildlife species that can be sustainably harvested.	CT-NRS.03.01.03.b. Describe techniques used in the harvesting of wildlife.	CT-NRS.03.01.03.c. Formulate a management plan for protecting wildlife from overexploitation.	
CT-NRS.03.01.04.a. Describe the value of fossil fuels to the economy.	CT-NRS.03.01.04.b. Describe sources of fossil fuels and products made from fossil fuels.	CT-NRS.03.01.04.c. Give examples of methods used to extract and process fossil fuels.	
CT-NRS.03.01.05.a. Identify recreational uses of natural resources (A8).*	CT-NRS.03.01.05.b. Debate an issue related to the recreational use of natural resources.	CT-NRS.03.01.05.c. Evaluate a natural resource site and recommend opportunities for recreational activities.	
CT-NRS.03.01.06.a. Identify aquatic species harvested for commercial and recreational purposes.	CT-NRS.03.01.06.b. Describe techniques used to harvest aquatic species.	CT-NRS.03.01.06.c. Harvest aquatic species according to sustainable management principles.	
CT-NRS.03.01.07.a. Identify uses of aquatic species.	CT-NRS.03.01.07.b. Explain techniques used to process aquatic species.	CT-NRS.03.01.07.c. Process harvested aquatic species.	
CT-NRS.04. Performance Element: Demonstrate techniques used to <u>protect natural resources</u>.			
CT-NRS.04.01. Performance Indicator: Diagnose plant and wildlife diseases and follow protocol to prevent their spread.			Science: F1 and F3 Social Studies: 9d
CT-NRS.04.01.01.a. Identify causes of diseases in plants.	CT-NRS.04.01.01.b. Report the observance of diseases affecting plants to the appropriate authorities.	CT-NRS.04.01.01.c. Explain management techniques used to reduce infection and spread of plant diseases in natural resources.	
CT-NRS.04.01.02.a. Identify causes of diseases in wildlife.	CT-NRS.04.01.02.b. Report the observance of diseases affecting wildlife to the appropriate authorities.	CT-NRS.04.01.02.c. Discuss various methods of disease and pest control in the natural environment (A4).*	

CT-NRS.04.01.03.a. Identify concepts and techniques used in environmental conservation law enforcement.	CT-NRS.04.01.03.b. Explain the importance of concepts and techniques in environmental conservation law enforcement and the impact illegal activities have on the environment.		
CT-NRS.04.02. Performance Indicator: Manage insect infestations of natural resources.			Science: C4 and F3
CT-NRS.04.02.01.a. Identify harmful and beneficial insects and signs of insect damage to natural resources.	CT-NRS.04.02.01.b. Report observance of insect pests to the appropriate authorities.	CT-NRS.04.02.01.c. Describe techniques used to manage pests of natural resources.	
CT-NRS.05. Performance Element: Use effective methods and venues to <u>communicate</u> natural resource processes to the public.			
CT-NRS.05.01. Performance Indicator: Communicate natural resource information to the public.			Science: F3 and F6 Language Arts: 5 and 6
CT-NRS.05.01.01.a. Identify ways in which a message regarding natural resources may be communicated to the public.	CT-NRS.05.01.01.b. Design and construct a display that communicates a natural resource topic and discusses the topic in a public forum.	CT-NRS.05.01.01.c. Communicate a natural resource message through the press, radio, television or public appearances.	
CT-NRS.06. Performance Element: Apply scientific <u>principles</u> to environmental service systems.			
CT-NRS.06.01. Performance Indicator: Apply soil science principles to environmental service systems.			Science: B2 and D2 Mathematics: SMP1, SMP2, SMP4, SMP5 Social Studies: 3K
CT-NRS.06.01.01.a. Explain the process of soil formation through weathering.	CT-NRS.06.01.01.b. Differentiate rock types and relate the chemical composition of mineral matter in soils to the parent material.	CT-NRS.06.01.01.c. Apply knowledge of soil orders to environmental service systems.	
CT-NRS.06.01.02.a. Describe the biodiversity found in soil and the contribution of biodiversity to the physical and chemical characteristics of soil.	CT-NRS.06.01.02.b. Relate the activities of microorganisms in soil to environmental service systems.	CT-NRS.06.01.02.c. Evaluate the uses of soil microorganisms in environmental service systems.	
CT-NRS.06.01.03.a. Explain how the physical qualities of the soil influence the infiltration and percolation of water.	CT-NRS.06.01.03.b. Identify the physical qualities of the soil that determine its use for environmental service systems.	CT-NRS.06.01.03.c. Conduct tests of soil to determine its use for environmental service systems.	
CT-NRS.06.01.04.a. Identify land uses, capability factors and land capability classes.	CT-NRS.06.01.04.b. Use a soil survey to determine the land capability classes for different parcels of land in an area.	CT-NRS.06.01.04.c. Design a master land-use management plan for a given area.	

CT-NRS.06.02. Performance Indicator: Apply hydrology principles to environmental service systems.			Science: D2
CT-NRS.06.02.01.a. Describe the world's water supplies and discusses the many uses of water.	CT-NRS.06.02.01.b. Describe characteristics of water that influence the biosphere and sustain life.	CT-NRS.06.02.01.c. Research and debate one or more current environmental issues associated with the supplies of groundwater and surface water.	
CT-NRS.06.02.02.a. Demonstrate knowledge of hydrogeology by differentiating between groundwater and surface water.	CT-NRS.06.02.02.b. Describe interactions between groundwater and surface water.	CT-NRS.06.02.02.c. Use groundwater-flow equations and Darcy's Law to explain how geology and meteorology affect groundwater and groundwater flow.	
CT-NRS.06.02.03.a. Define groundwater potential.	CT-NRS.06.02.03.b. Identify differences in groundwater potential.	CT-NRS.06.02.03.c. Delineate groundwater potential zones.	
CT-NRS.06.02.04.a. Identify environmental hazards associated with groundwater supplies.	CT-NRS.06.02.04.b. Describe precautions taken to prevent/reduce contamination of groundwater supplies.	CT-NRS.06.02.04.c. Test, document and monitor the quality of groundwater supplies.	
CT-NRS.07.01. Performance Indicator: Use pollution control measures to maintain a safe facility environment.			Science: F4 and F5
CT-NRS.07.01.01.a. Identify types of pollution and distinguish between point source and nonpoint source pollution.	CT-NRS.07.01.01.b. Give examples of how industrial and nonindustrial pollution has damaged the environment.	CT-NRS.07.01.01.c. Survey the local area for evidence of industrial and nonindustrial pollution.	
CT-NRS.07.01.02.a. Describe ways in which pollution can be managed and prevented.	CT-NRS.07.01.02.b. Conduct tests to determine the presence and extent of pollution.	CT-NRS.07.01.02.c. Plan and develop a pollution remediation, management or prevention program.	
CT-NRS.07.01.03.a. Identify types of air pollutants and their sources.	CT-NRS.07.01.03.b. Determine and describe impact air quality has on the environment and society.	CT-NRS.07.01.03.c. Monitor air quality and assess environmental risks.	
CT-NRS.07.02. Performance Indicator: Manage safe disposal of all categories of solid waste.			Science: F1, F4 and F5 Mathematics: SMP4, SMP5
CT-NRS.07.02.01.a. Understand appropriate soil, air and water monitoring and waste management practices (A9).*	CT-NRS.07.02.01.b. Evaluate environmental hazards created by different types of solid waste, solid waste accumulation and solid waste disposal.	CT-NRS.07.02.01.c. Analyze environmental hazards associated with the identification and acceptance of solid waste disposal sites.	

CT-NRS.07.02.02.a. Discuss practical management options for treating solid waste.	CT-NRS.07.02.02.b. Identify characteristics of solid waste treatment and recognize the byproducts of solid waste treatment.	CT-NRS.07.02.02.c. Collect and treat solid waste materials.	
CT-NRS.07.02.03.a. Define sanitary landfill.	CT-NRS.07.02.03.b. Explain basic sanitary landfill operating procedures and design.	CT-NRS.07.02.03.c. Evaluate sanitary landfill procedures.	
CT-NRS.07.02.04.a. Define compost and composting.	CT-NRS.07.02.04.b. Explain scientific principles related to composting.	CT-NRS.07.02.04.c. Evaluate methods of operating a composting facility.	
CT-NRS.07.02.05.a. Explain the basic concepts associated with solid waste incineration.	CT-NRS.07.02.05.b. Describe the environmental impact of solid waste incineration.	CT-NRS.07.02.05.c. Evaluate methods of incinerating solid waste, including those used in waste-to-energy plants.	
CT-NRS.07.02.06.a. Explain the importance of recycling.	CT-NRS.07.02.06.b. Describe recycling methods and identify materials that can be recycled.	CT-NRS.07.02.06.c. Survey and evaluate local recycling programs and procedures.	
CT-NRS.08. Performance Element: Apply knowledge of equipment and tools usage to natural resources management activities.			
CT-NRS.08.01. Performance Indicator: Develop skill in the safe use of natural resources related tools and equipment.			
CT-NRS.08.01.01.a. Identify tools, materials and equipment for use in natural resources (A1).*	CT-NRS.08.01.01.b. Describe the proper safe use or function of tools, materials and equipment for use in natural resources.	CT-NRS.08.01.01.c. Demonstrate the safe use of tools, materials and equipment for use in natural resources.	

Plant Science

Pathway Content Standard: The student will demonstrate competence in the application of scientific principles and techniques to the production and management of plants.

Level 1	Level 2	Level 3	National Academic Standard
CT-PS.01. Performance Element: Apply knowledge of <u>plant classification, plant anatomy and plant physiology</u> to the production and management of plants.			
CT-PS.01.01. Performance Indicator: Classify agricultural plants according to taxonomy systems.			Science: C3
CT-PS.01.01.01.a. Explain systems used to classify plants.	CT-PS.01.01.01.b. Identify plants important to the Connecticut Horticulture industry by common names.	CT-PS.01.01.01.c. Identify plants important to the Connecticut Horticulture industry by scientific names.	
CT-PS.01.01.02.a. Apply knowledge of plant anatomy and classification to horticultural plant production (A1).*			
CT-PS.01.02. Performance Indicator: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.			Science: B6, C3 and C5
CT-PS.01.02.01.a. Diagram a typical plant cell and identify plant cell organelles and their functions.	CT-PS.01.02.01.b. Describe the processes of mitosis and meiosis as they relate to plant growth and development.	CT-PS.01.02.01.c. Apply the knowledge of cell differentiation to plant propagation and production.	
CT-PS.01.02.02.a. Identify the components, the types and the functions of plant roots.	CT-PS.01.02.02.b. Identify the different types or root systems on plant species important to the Connecticut Horticulture industry.	CT-PS.01.02.02.c. Apply the knowledge of root structure to plant production, propagation and use by consumers.	
CTPS.01.02.03.a. Identify the components and the functions of plant stems.	CT-PS.01.02.03.b. Describe the processes of translocation.	CT-PS.01.02.03.c. Apply concepts associated with translocation to the management of plants.	
CT-PS.01.02.04.a. Discuss leaf morphology and the functions of leaves.	CT-PS.01.02.04.b. Explain how leaves capture light energy and allow for the exchange of gases.	CT-PS.01.02.04.c. Identify and design systems to manage the capture of light energy.	
CT-PS.01.02.05.a. Identify the components of a flower, the functions of a flower and the functions of flower components.	CT-PS.01.02.05.b. Identify the different types and forms of flowers based on their botanical structure.	CT--PS.01.02.05.c. Apply the knowledge of flower structures to plant breeding, production and use.	
CT-PS.01.02.06.a. Explain the functions and components of seeds and fruit.	CT-PS.01.02.06.b. Identify the major types of fruit.	CT-PS.01.02.06.c. Apply the knowledge of seed and fruit structures to plant culture and use.	

CT-PS.01.03. Performance Indicator: Apply knowledge of plant physiology and energy conversion to plant systems.			Science: B6 and C5 Mathematics: SMP4, SMP5
CT-PS.01.03.01.a. Explain the process of photosynthesis and plant respiration (A2).*	CT-PS.01.03.01.b. Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis.	CT-PS.01.03.01.c. Explain the light-dependent and light-independent reactions that occur during photosynthesis and apply the knowledge to plant management.	
CT-PS.01.03.02.a. Explain cellular respiration and its importance to plant life.	CT-PS.01.03.02.b. Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration.	CT-PS.01.03.02.c. Explain the process of aerobic respiration and how it relates to plant growth, crop management and post-harvest handling.	
CT-PS.01.03.03.a. Describe the role of the apical meristem in primary growth.	CT-PS.01.03.03.b. Identify how common management practices affect plant growth.	CT-PS.01.03.03.c. Apply the principles of plant growth and common management practices to horticultural production.	
CT-PS.01.03.04.a. Identify naturally occurring plant hormones and synthetic growth regulators.	CT-PS.01.03.04.b. Identify the plant responses to plant growth regulators and different forms of tropism.	CT-PS.01.03.04.c. Select plant growth regulators to produce desired responses from plants.	
CT-PS.02. Performance Element: Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients and soil on plant growth.			
CT-PS.02.01. Performance Indicator: Determine the influence of environmental factors on plant growth.			Science: C6
CT-PS.02.01.01.a. Describe the effects air, temperature and water have on plant metabolism and growth.	CT-PS.02.01.01.b. Determine the optimal air, temperature and water conditions for plant growth.	CT-PS.02.01.01.c. Design, implement and evaluate a plan to maintain optimal conditions for plant growth.	
CT-PS.02.02. Performance Indicator: Evaluate soil/media and prepare soil/growth media for use in plant systems.			Math: CCSS: S-IC, SMP4, SMP5 Science: B2
CT-PS.02.02.01.a. Identify the major components of soil/growing media and describe how growing media support plant growth.	CT-PS.02.02.01.b. Describe the physical characteristics of soil/growing media and explain the influence they have on plant growth.	CT-PS.02.02.01.c. Select, formulate and prepare soil/growing media for specific plants or crops.	
CT-PS.02.02.02.a. Identify the differences between clay, sand and silt soils.	CT-PS.02.02.02.b. Describe how soil texture affects drainage and plant growth.	CT-PS.02.02.02.c. Determine soil texture and make necessary modifications to maximize plant growth.	

CT-PS.02.02.03a. Describe the influence of soil (including growing media), water and other environmental factors on horticultural plant growth (A3).*			
CT-PS.02.03. Performance Indicator: Develop and implement a fertilization plan for specific plants or crops.			Math: CCSS: S-IC; SMP1, SMP2 Science: A2
CT-PS.02.03.01.a. Identify the essential nutrients for plant growth and development and their major functions.	CT-PS.02.03.01.b. Describe nutrient deficiency symptoms and recognize environmental causes of nutrient deficiencies.	CT-PS.02.03.01.c. Monitor plants for signs of nutrient deficiencies and prepare a scouting report.	
CT-PS.02.03.02.a. Describe pH and its effect on plant growth.	CT-PS.02.03.02.b. Explain the influence of pH and cation exchange capacity on the availability of nutrients.	CT-PS.02.03.02.c. Adjust the pH of growing media.	
CT-PS.02.03.03.a. Collect soil samples for testing and interpret test results.	CT-PS.02.03.03.b. Determine the nutrient content of soil using appropriate laboratory procedures.	CT-PS.02.03.03.c. Analyze results of soil tests to develop a nutrient management plan.	
CT-PS.02.03.04.a. Identify Fertilizer sources, formulations and the various methods of fertilizer application.	CT-PS.02.03.04.b. Compare efficiency and effectiveness of different fertilizer formulas and application methods.	CT-PS.02.03.04.c. Calculate fertilizer rates calibrate and operate equipment needed to meet crop nutrient needs.	
CT-PS.02.03.05.a. Compare fertilizer types/sources.	CT-PS.02.03.05.b. Compare costs and potential environmental impact of fertilizer types.	CT-PS.02.03.05.c. Evaluate cost/benefits of fertilization plans.	
CT-PS.03. Performance Element: <u>Propagate culture and harvest plants.</u>			
CT-PS.03.01. Performance Indicator: Demonstrate plant propagation techniques.			Math: CCSS: N-Q; G-GMD; SMP1, SMP2 Science: C2
CT-PS.03.01.01.a. Explain sexual and asexual propagation.	CT-PS.03.01.01.b. Diagram the parts of the flower and the process of process of plant fertilization.	CT-PS.03.01.01.c. Explain plant life cycles, sexual propagation, and the advantages and disadvantages of hybrid plants (A4).*	
CT-PS.03.01.02.a. Describe types of seed and explain proper seed storage.	CT-PS.03.01.02.b. Demonstrate sowing techniques and favorable conditions for seed germination.	CT-PS.03.01.02.c. Evaluate and adjust germination conditions, monitor for common disorders during germination.	
CT-PS.03.01.03.a. Identify methods and optimal conditions for asexual propagation.	CT-PS.03.01.03.b. Demonstrate proper techniques used to propagate plants by cuttings, division, separation, layering, budding and grafting.	CT-PS.03.01.03.c. Evaluate asexual propagation practices based on productivity and efficiency.	

CT-PS.03.01.04.a. Define micro propagation and explain its use in horticultural production.	CT-PS.03.01.04.b. Explain the advantages of micro propagation and the potential for problems with this method.	CT-PS.03.01.04.c. Describe optimal conditions for asexual propagation and demonstrate an understanding of techniques used in asexual plant propagation and plant micro-propagation (A5).*	
PS.03.01.05.a. Explain the principles behind recombinant DNA technology and the basic steps in the process.	PS.03.01.05.b. Give examples of the risks and advantages associated with genetically modified plants.	PS.03.01.05.c. Evaluate the performance of genetically modified crops.	
PS.03.02. Performance Indicator: Develop and implement a plant management plan for crop production.			Science: C5 and C6 Language Arts: 7
CT-PS.03.02.01.a. Demonstrate proper planting procedures and post-planting care.	CT-PS.03.02.01.b. Select and demonstrate appropriate planting procedures and post-planting care techniques.	CT-PS.03.02.01.c. Evaluate the effectiveness of various pre-plant treatments and post planting procedures for crops.	
CT-PS.03.02.02.a. Demonstrate appropriate cultural practices for crops.	CT-PS.03.02.02.b. Observe and record the effects of environmental conditions and cultural practices on crops.	CT-PS.03.02.02.c. Design a management plan, monitor crop progress and make adjustments as necessary to maximize production.	
CT-PS.03.02.03.a. Identify factors that influence water holding capacity and drainage in soil/growing media.	CT-PS.03.02.03.b. Compare and contrast irrigation and water conservation methods.	CT-PS.03.02.03.c. Design and evaluate irrigation systems for plant production.	
CT-PS.03.02.04.a. Identify examples of crops where the production schedule is influenced by market demand.	CT-PS.03.02.04.b. Develop a crop schedule for various horticulture crops based on desired market delivery date.	CT-PS.03.02.04.c. Implement and evaluate the effectiveness of alternative crop schedules for a specific horticultural crop.	
CT-PS.03.02.05.a. Identify advantages and disadvantages of plant growing structures and specific crop growing areas.	CT-PS.03.02.05.b. Demonstrate knowledge of greenhouse structures and environmental controls (A9).*	CT-PS.03.02.05.c. Design the layout of the planting area to maximize the use of growing space and produce quality crops.	
CT-PS.03.02.05a. Demonstrate knowledge of plant maintenance practices for interior plants and landscaping including Integrated Pest Management (I.P.M.) (A8).*			

CT-PS.03.03. Performance Indicator: Develop and implement a plan for integrated pest management.			Math: CCSS: N-Q; G-GMD; SMP1, SMP2, SMP3, SMP4, SMP5, SMP6 Science: C4 and C6 Language Arts: 7
CT-PS.03.03.01.a. Identify types of plant pests and disorders.	CT-PS.03.03.01.b. Identify major local weeds, insect pests and infectious and noninfectious plant diseases.	CT-PS.03.03.01.c. Design and implement a crop scouting program.	
CT-PS.03.03.02.a. Describe damage caused by plant pests and diseases.	CT-PS.03.03.02.b. Diagram the life cycles of major plant pests and diseases.	CT-PS.03.03.02.c. Predict pest and disease problems based on environmental conditions and life cycles.	
CT-PS.03.03.03.a. Define integrated pest management.	CT-PS.03.03.03.b. Describe integrated pest management strategies.	CT-PS.03.03.03.c. Develop and implement a plant management plan for greenhouse production including Integrated Pest Management (I.P.M.) (A6).*	
CT-PS.03.03.04.a. Explain risks and benefits associated with the materials and methods used in plant pest management.	CT-PS.03.03.04.b. Explain procedures for the safe handling, use and storage of pesticides.	CT-PS.03.03.04.c. Evaluate environmental and consumer concerns regarding pest management strategies.	
CT-PS.03.04. Performance Indicator: Apply principles and practices of various plant production methods to meet the needs of the market.			Science: F3, F4 and F6
CT-PS.03.04.01.a. Explain sustainable agriculture and objectives associated with the strategy.	CT-PS.03.04.01.b. Describe sustainable agriculture practices and compares the ecological effects of traditional agricultural practices with those of sustainable agriculture.	CT-PS.03.04.01.c. Prepare and implement a plan for an agricultural enterprise that involves practices in support of sustainable agriculture.	
CT-PS.03.04.02.a. Compare methods of production including the social/marketing aspects of organic farming, sustainable agriculture, and genetic engineering in plant science (A7).*	CT-PS.03.04.02.b. Determine the 'marketability' of sustainable and/or organic methods of production.	CT-PS.03.04.02.c. Evaluate environmental effects and consumer attitudes regarding different production strategies.	
CT-PS.03.04.03.a. Identify types of crops that can be produced and marketed in a specified 'local' area.	CT-PS.03.04.03.b. Determine the 'marketability' of locally grown products.	CT-PS.03.03.02.c. Evaluate cost/benefits of locally grown and marketed products.	

CT-PS.04. Performance Element: <u>Employ elements of design</u> to enhance an environment.			
CT-PS.04.01. Performance Indicator: Create designs using plants.			Math: CCSS: G-MG; SMP4, SMP5 Language Arts: 12
CT-PS.04.01.01.a. Apply artistic principles in both floral and landscape design (A10).*	CT-PS.04.01.01.b. Explain how the elements and principles of design influence the visual effect, the shape and the purpose of specific designs.	CT-PS.04.01.01.c. Select plants, hard goods, supplies and other materials for use in a design based on a range of criteria.	
CT-PS.04.01.02.a. Discuss the applications of art in agriculture/horticulture.	CT-PS.04.01.02.b. Discuss principles of design that form the basis of artistic impression.	CT-PS.04.01.02.c. Evaluate and create designs by following established principles of art.	
CT-PS.04.01.03.a. Describe the factors that influence the conditioning and vase life of cut flowers, greens and decorative plants.	CT-PS.04.01.03.b. Demonstrate appropriate conditioning and storage of cut flowers.	CT-PS.04.01.03.c. Evaluate the effects of proper care and handling of cut flowers greens and decorative plants.	
CT-PS.04.01.04.a. Identify and select common forms and types of flowers and foliage's used in the floriculture industry.	CT-PS.04.01.04.b. Order the correct quantity of flowers and foliage to create a floral piece.	CT-PS.04.01.04.c. Evaluate the use and positioning of flowers and foliage in a floral piece.	
CT-PS.04.01.05.a. Identify common tools and supplies used in the floral industry.	CT-PS.04.01.05.b. Select and safely use tools, supplies and equipment common in the floral industry.	CT-PS.04.01.05.c. Evaluate tools and supplies available in lab/shop and order supplies based on needs of the lab.	
CT-PS.04.01.06.a. Identify factors that influence pricing, scheduling and marketing of a floriculture product or crop.	CT-PS.04.01.06.b. Assess the scheduling, pricing and marketing effectiveness of a floriculture product or crop.	CT-PS.04.01.06.c. Create a production plan for a floriculture product or crop that considers scheduling pricing and marketing.	
CT-PS.04.02 Performance Indicator: Determine supplies needed to create landscape designs and develop a marketing plan.			Math: CCSS: N-Q; G-GMD; SMP4, SMP5, SMP6, SMP7
CT-PS.04.02.01.a. Identify the uses and the selection criteria of landscape plants and hardscape materials for a Connecticut landscape plan.	CT-PS.04.02.01.b. Evaluate the landscape plants and hardscape design selected to meet the needs of a specific landscape plan.	CT-PS.04.02.01.c. Create a landscape plan that utilizes proper landscape plants and hardscapes to meet the needs of a client's landscape plan.	
CT-PS.04.02.02.a. Identify techniques, tools and technology used in landscape drawings (A11).*	CT-PS.04.02.02.b. Select and safely use tools, supplies and equipment in the landscape industry.	CT-PS.04.02.02.c. Evaluate supplies and equipment available in lab/business and order equipment and supplies based on needs of the lab/business.	

CT-PS.04.02.03.a. Identify common plant and hardscape landscape symbols.	CT-PS.04.02.03.b. Create a landscape drawing using an architect/engineer scale and related drawing tools.	CT-PS.04.02.03.c. Create a landscape drawing using a variety of artistic methods.	
CT-PS.04.02.04.a. Define the principles of landscape design.	CT-PS.04.02.04.b. Evaluate a landscape and explain the impact of the design principles.	CT-PS.04.02.04.c. Create a landscape proposal that implements the principles of design.	
CT-PS.04.02.05.a. Identify factors that influence pricing and marketing of landscape estimate.	CT-PS.04.02.05.b. Assess the pricing and marketing effectiveness of a landscape estimate.	CT-PS.04.02.05.c. Create a business plan and estimate for a landscape proposal that considers scheduling, pricing and marketing.	
CT-PS.04.02.06.a. Identify factors that should be considered for turf grass installation, establishment, maintenance and management.	CT-PS.04.02.06.b. Develop a plan to successfully install or establish and maintain turf grass.	CT-PS.04.02.06.c. Demonstrate skills and knowledge used in turf grass installation, establishment, maintenance and management.	
CT-PS.04.02.07.a. Identify factors that influence pricing, scheduling and marketing of a floriculture product or crop.	CT-PS.04.02.07.b. Assess the scheduling, pricing and marketing effectiveness of a floriculture product or crop.	CT-PS.04.02.07.c. Create a production plan for a floriculture product or crop that considers scheduling pricing and marketing.	
CT-PS.04.02.07.c Demonstrate knowledge of skills needed in the floral design industry (A12).*			

Power Structural and Technical Systems (Agriculture Mechanics)

Equipment Operation and Maintenance			
Pathway Content Standard: Use physical science principles and engineering applications with power, structural and technical systems to solve problems and improve performance.			
Level 1	Level 2	Level 3	National Academic Standard
CT-PST.01. Performance Element: Use <u>physical science principles</u> and engineering applications with power, structural and technical systems to solve problems and improve performance.			
CT-PST.01.0. Performance Indicator: Apply physical science laws and principles to identify, classify and use lubricants.			Math: CCSS: N-Q Science: B4
CT-PST.01.01.01.a. Classify lubricants by source, sustainability and equipment compatibility.	CT-PST.01.01.01.b. Classify lubricants by SAE viscosity and API service classifications.	PST.01.02.01.c. Select, use and dispose of lubricants according to local, state and federal regulations.	
CT-PST.01.02. Performance Indicator: Identify and use hand and power tools and equipment for service, construction and fabrication.			Science: E2 Mathematics: SMP4
CT-PST.01.02.01.a. Identify and explain the appropriate use of tools used in agriculture mechanics (A6).*	CT-PST.01.02.01.b. Maintain and repair tools used in agriculture mechanics (A7).*	CT-PST.01.02.01.c. Assess the performance of self and/or peers in use of hand and power tools to safely and efficiently service, construct and fabricate quality products.	
CT-PST.01.02.02.a. Select appropriate tools and materials to construct wood structures related to agriculture. (A1).*			
CT-PST.02. Performance Element: <u>Design, operate and maintain</u> mechanical equipment, structures, biological systems, land treatment, power and technology.			
CT-PST.02.01. Performance Indicator: Perform service routines to maintain power units and equipment.			Science: E2 Mathematics: SMP4, SMP5
CT-PST.02.01.01.a. Identify and schedule power unit and equipment lubrication.	CT-PST.02.01.01.b. Ensure the presence and function of safety systems and hardware on tools and equipment.	CT-PST.02.01.01.c. Test and service electrical systems.	
CT-PST.02.02. Performance Indicator: Operate, service and diagnose the condition of power units and equipment.			Science: E2 Mathematics: SMP4, SMP5
CT-PST.02.02.01.a. Operate and maintain agricultural machinery and power systems (A8).*	CT-PST.02.02.01.b. Use operator/service/technical manuals utilized in agriculture mechanics (A4).*	CT_PST.02.02.01.c. Select power units and equipment for operational efficiencies.	

CT-PST.02.02.02.a. Perform pre-operation inspection according to manufacturers' specifications and/or prevailing industry standards.	CT-PST.02.02.02.b. Explain the safe operation of agricultural tractors and related agricultural equipment (A5).*	CT-PST.02.02.02.c. Adjust equipment for safe and efficient operation.	
Internal Combustion Engines, (small and large)			
CT-PST.03. Performance Element: <u>Service and repair</u> agricultural mechanical equipment and power systems.			
CT-PST.03.01. Performance Indicator: Troubleshoot and repair internal combustion engines.			Science: A1 and A4 Language Arts: 3
CT-PST.03.01.01.a. Identify components and systems of internal combustion engines.	CT-PST.03.01.01.b. Utilize technical manuals and computer-based diagnostics in engine analysis and repair.	CT-PST.03.01.01.c. Performance test internal combustion engines to determine service and repair needs.	
CT-PST.03.01.02.a. Describe the operation of internal combustion engines by types of fuel used.	CT-PST.03.01.02.b. Analyze and troubleshoot internal combustion engines.	CT-PST.03.01.02.c. Overhaul spark-and-compression internal combustion engines.	
Power/Transmission and Hydraulics			
CT-PST.03.02. Performance Indicator: Service and repair power transmission systems of agricultural equipment.			Math: CCSS: N-Q; SMP1, SMP2 Science: B4 and E1
CT-PST.03.02.01.a. Identify and describe applications of simple machines in power systems.	CT-PST.03.02.01.b. Identify and compare operation principles and features, benefits and applications of various power transmission systems.	CT-PST.03.02.01.c. Use speed, torque and power measurements to improve efficiency in power transmission systems.	
CT-PST.03.02.02.a. Calculate mechanical advantage in mechanical systems.	CT-PST.03.02.02.b. Describe features, benefits and applications of mechanical transmission components, including belts, chains, gears, bearings, seals, universals and drive shafts.	CT-PST.03.02.02.c. Inspect, analyze and repair hydrostatic transmissions.	
CT-PST.03.02.03.a. Identify power transfer principles, including those using friction, gears and fluids.	CT-PST.03.02.03.b. Inspect, analyze and repair clutches and brakes.	CT-PST.03.02.03.c. Inspect, analyze and repair differentials, final drives, transmissions (including gear-type and power-shift transmissions) and auxiliary drives.	
CT-PST.03.03. Performance Indicator: Service and repair hydraulic and pneumatic systems.			Science: B4 and E1 Mathematics: SMp1, SMP2, SMP4, SMP5
CT-PST.03.03.01.a. Describe features, benefits and applications of common types of hydraulic and pneumatic systems.	CT-PST.03.03.01.b. Describe principles of hydraulic and pneumatic system operation.	CT-PST.03.03.01.c. Utilize symbols and schematic drawings in the maintenance of hydraulic and pneumatic systems.	

CT-PST.03.03.02.a. Apply hydrostatic and hydrodynamic principles in hydraulics and pneumatics, including Archimedes' principle and Pascal's law.	CT-PST.03.03.02.b. Identify major components of hydraulic and pneumatic systems and describe their use.	CT-PST.03.03.02.c. Inspect, analyze and repair hydraulic and pneumatic system components, including fluid and compressed-air conveyance components.	
CT-PST.03.03.03.a. Evaluate hydraulic and pneumatic system functionality.	CT-PST.03.03.03.b. Identify hydraulic and pneumatic system fittings and ports.	CT-PST.03.03.03.c. Use a pressure-and-flow tester in diagnosing malfunctions and repairing hydraulic and pneumatic systems.	
CT-PST.03.03.04.a. Describe the meaning and use of sensors, controllers and actuators.	CT-PST.03.03.04.b. Identify sensor, control, and actuator system components on power units and equipment.	CT-PST.03.03.04.c. Diagnose malfunctions and repair control systems and sensors, including those of engines, transmissions and implements.	
Electricity, Electrical Motors and Controls			
CT- PST.03.04. Performance Indicator: Install maintains and troubleshoots agricultural electrical systems.			Math: CCSS: N-Q; SMP1, SMP2, SMP4, SMP5 Science: E1
CT-PST.03.04.01.a. Apply the meaning and measurement of electricity, including amperage, voltage and wattage.	CT-PST.03.04.01.b. Assess and install electrical circuits, including conductors, insulators and controls.	CT-PST.03.04.01.c. Evaluate power unit and equipment electrical systems, including ignition, lighting, auxiliary and electronic braking.	
CT-PST.03.04.02.a. Identify the kinds and applications of electricity, including direct and alternating current.	CT-PST.03.04.02.b. Interpret electrical system symbols and diagrams.	CT-PST.03.04.02.c. Assess and repair malfunctioning electrical systems and components, such as battery, lighting, instrumentation and accessories.	
CT-PST.03.04.03.a. Identify electricity measurements and make measurement calculations.	CT-PST.03.04.03.b. Distinguish electrical circuits and components of each.	CT-PST.03.04.03.c. Install and/or repair electrical wiring components and fixtures following appropriate codes and standards.	
CT-PST.03.04.04.a. Discuss various types and sources of electricity including renewable and sustainable sources.	CT-PST.03.04.04.b. Use volt and amp meters and continuity testers to demonstrate electricity principles.	CT-PST.003.04.04.c. Locate and use electrical codes and regulations.	

CT-PST.03.04.05.a. Recognize common electrical symbols.	CT-PST.03.04.05.b. Read and design schematic drawings for an electrical control system.	CT-PST.03.04.05.c. Identify and use electrical control system components, including transistors, relays, HVAC and logic controllers.	
CT-PST.03.04.06.a. Identify uses of electrical sensors and controls.	CT-PST.03.04.06.b. Interpret maintenance schedules for electrical control systems.	CT-PST.03.04.06.c. Troubleshoot electrical control system performance problems.	Math: CCSS: N-Q; SMP4
CT-PST.03.04.07.a. Identify hazards and safety practices in planning, installing and using electricity.	CT-PST.04.03.07.b. Distinguish and select materials and tools used in electrical control circuit installation.	CT-PST.04.03.07.c. Plan and install electrical control circuits to assure proper operation.	
Agricultural Structures			
CT-PST.04. Performance Element: Follow architectural and mechanical plans to construct agricultural buildings and facilities.			
CT-PST.04.01. Performance Indicator: Create sketches and plans of agricultural structures.			Math: CCSS: G-GMD.2; G-MG; SMP4, SMP5, SMP6 Science: A3 and E1
CT-PST.04.01.01.a. Identify symbols and drawing techniques used to develop plans and sketches.	CT-PST.04.01.01.b. Develop plans and sketches using drafting equipment and computer programs.	CT-PST.04.01.01.c. Apply principles of design, fabrication and installation of agricultural structures.	
CT-PST.04.01.02.a. Prepare bills of materials to accompany plans and sketches.	CT-PST.04.01.02.b. Use scale measurement and dimension to develop plans and sketches.	CT-PST.04.01.02.c. Design functional and efficient facilities for agricultural use.	
CT-PST.04.02. Performance Indicator: Apply structural plans, specifications and building codes.			Math: CCSS: N-Q; SMP4, SMP5, SMP6 Language Arts: 12
CT-PST.04.02.01.a. Understand agricultural plans/drawings and measure accurately (A12).*	CT-PST.04.02.01.b. Identify and interpret different views of a construction drawing.	CT-PST.04.02.01.c. Locate, explain and apply elements of a construction drawing.	
CT-PST.04.02.02.a. Identify the sources and importance of industry construction and materials standards, including those of the American National Standards Institute (ANSI) and Underwriters' Laboratories (UL).	CT-PST.04.02.02.b. Identify local code enforcement agencies and procedures.	CT-PST.04.02.02.c. Follow local construction and safety codes and specifications in agricultural construction.	
CT-PST.04.02.03.a. Identify design and construction recommendations and practices in agricultural structures.	CT-PST.04.02.03.b. Read and interpret local structural code information.	CT-PST.04.02.03.c. Complete appropriate local permit applications for a construction project.	

CT-PST.04.02.04a. Explain wiring of basic agricultural structures (A9).*			
CT-PST.04.03. Performance Indicator: Examine structural requirements for materials and procedures and estimate construction cost.			Math: CCSS: N-Q; SMP1, SMP2
CT-PST.04.03.01.a. Identify criteria in selecting materials in agricultural construction/fabrication.	CT-PST.04.03.01.b. Select types of materials; determine quantities and estimate their costs and other costs associated with a specified project plan.	CT-PST.04.03.01.c. Prepare a project cost estimate, including materials, labor and management.	
CT-PST.04.03.02.a. Explain the importance and use of requests for construction bids.	CT-PST.04.03.02.b. Establish business relationships with vendors of materials and services used in agricultural construction.	CT-PST.04.03.02.c. Prepare a bid package for a planned construction project, including construction timelines, site evaluation, construction plans and related management factors.	
CT-PST.04.04. Performance Indicator: Follow architectural and mechanical plans to construct and/or repair equipment, buildings and facilities.			Math: CCSS: N-Q; SMP1, SMP2 Science: E2
CT-PST.04.04.01.a. Plan, build and maintain agricultural structures (A11).*	CT-PST.04.04.01.b. Understand plumbing systems related to agricultural production (A10).*	CT-PST.04.04.01.c. Evaluate work products or samples for quality and efficiency of workmanship following architectural and mechanical plans.	
CT-PST.04.04.02.a. Calculate areas and volumes for coatings.	CT-PST.04.04.02.b. Paint or protect with coatings.	CT-PST.04.04.02.c. Electroplate or otherwise coat materials.	
CT-PST.04.04.03.a. Measure and calculate materials for concrete, brick, stone or masonry units in agricultural construction.	CT-PST.04.04.03.b. Explain building and repair of concrete and masonry structures related to agriculture (A3).*	CT-PST.04.04.03.c. Seal, pigment and otherwise prepare concrete, brick, stone or masonry unit surfaces.	
Welding			
CT-PST.05.01. Performance Indicator: Follow architectural and mechanical plans to construct and/or repair equipment, buildings and facilities.			Math: CCSS: N-Q; G-MG; SMP1, SMP2
PST.05.01.01.a. Identify kinds and characteristics of metal materials.	CT-PST.05.01.01.b. Compare welding (arc, oxyacetylene and M.I.G.) techniques used in agriculture mechanics (A2).*	CT-PST.05.01.01.c. Construct and/or repair metal structures and equipment using welding fabrication procedures, including those associated with SMAW, GMAW, GTAW, fuel-oxygen and plasma arc torch methods.	

APPENDIX I

Common Core of States Standards in Mathematic

Mathematics

The Common Core State Standards Initiative is a state-led effort coordinated by the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO). The standards were developed in collaboration with teachers, school administrators, and experts, to provide a clear and consistent framework to prepare our children for college and the workforce.

The NGA Center and CCSSO received initial feedback on the draft standards from national organizations representing, but not limited to, teachers, postsecondary educators (including community colleges), civil rights groups, English language learners, and students with disabilities. Following the initial round of feedback, the draft standards were opened for public comment, receiving nearly 10,000 responses.

The standards are informed by the highest, most effective models from states across the country and countries around the world, and provide teachers and parents with a common understanding of what students are expected to learn. Consistent standards will provide appropriate benchmarks for all students, regardless of where they live.

These standards define the knowledge and skills students should have within their K-12 education careers so that they will graduate high school able to succeed in entry-level, credit-bearing academic college courses and in workforce training programs. The standards:

- Are aligned with college and work expectations;
- Are clear, understandable and consistent;
- Include rigorous content and application of knowledge through high-order skills;
- Build upon strengths and lessons of current state standards;
- Are informed by other top performing countries, so that all students are prepared to succeed in our global economy and society; and
- Are evidence-based.

Grade High School Standards for Mathematical Practice (SMP)

The K-12 Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. This page gives examples of what the practice standards look like at the specified grade level.

<i>Standards</i>	<i>Explanations and Examples</i>
<p>Students are expected to:</p> <p>SMP1. Make sense of problems and persevere in solving them.</p>	<p>High school students start to examine problems by explaining to themselves the meaning of a problem and looking 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. By high school, 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. They check their answers to problems using different methods and continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.</p>
<p>Students are expected to:</p> <p>SMP2. Reason abstractly and quantitatively.</p>	<p>High school students seek to make sense of quantities and their relationships in problem situations. They abstract a given situation and represent it symbolically, manipulate the representing symbols, and pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Students use quantitative reasoning to create coherent representations of the problem at hand; consider the units involved; attend to the meaning of quantities, not just how to compute them; and know and flexibly use different properties of operations and objects.</p>
<p>Students are expected to:</p> <p>SMP3. Construct viable arguments and critique the reasoning of others.</p>	<p>High school students understand 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.</p>

	<p>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. High school 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. High school students learn to determine domains to which an argument applies, listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.</p>
<i>Standards</i>	<i>Explanations and Examples</i>
<p>Students are expected to: SMP4. Model with mathematics.</p>	<p>High school students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. 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. High school students 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.</p>
<p>Students are expected to: SMP5. Use appropriate tools strategically.</p>	<p>High school students 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. High school students should be 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, 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</p>

	<p>consequences, and compare predictions with data. They 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</p>
<p>Students are expected to: SMP6. Attend to precision</p>	<p>High school students try to communicate precisely to others by using clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, 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. By the time they reach high school they have learned to examine claims and make explicit use of definitions.</p>

<i>Standards</i>	<i>Explanations and Examples</i>
<p>Students are expected to:</p> <p>SMP7. Look for and make use of structure.</p>	<p>By high school, students look closely to discern a pattern or structure. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 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. High school students use these patterns to create equivalent expressions, factor and solve equations, and compose functions, and transform figures.</p>
<p>Students are expected to:</p> <p>SMP8. Look for and express regularity in repeated reasoning.</p>	<p>High school students notice if calculations are repeated, and look both for general methods and for shortcuts. 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, derive formulas or make generalizations, high school students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.</p>

Understand solving equations as a process of reasoning and explain the reasoning.

A-REI.1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

A-REI.2. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

Solve equations and inequalities in one variable.

A-REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A-REI.4. Solve quadratic equations in one variable.

Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.

Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .

Solve systems of equations.

A-REI.5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.

A-REI.6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

A-REI.7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.

A-REI.8. (+) Represent a system of linear equations as a single matrix equation in a vector variable.

A-REI.9. (+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3×3 or greater).

Represent and solve equations and inequalities graphically.

A-REI.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

A-REI.11. Explain why the x -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include

cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

A-REI.12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.

Understand the concept of a function and use function notation.

F-IF.1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.

F-IF.2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F-IF.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.

Interpret functions that arise in applications in terms of the context.

F-IF.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F-IF.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.

F-IF.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.

Analyze functions using different representations.

F-IF.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

- a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
- b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
- d. (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
- e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

F-IF.8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.

- a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
- b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.

F-IF.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.

Experiment with transformations in the plane

G.CO.1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.

G-CO.2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).

G-CO.3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.

G-CO.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

G-CO.5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.

Understand congruence in terms of rigid motions

G-CO.6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.

G-CO.7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.

G-CO.8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.

Prove geometric theorems

G-CO.9. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.

G-CO.10. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180° ; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.

G-CO.11. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.

Make geometric constructions

G-CO.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

G-CO.13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.

Summarize, represent, and interpret data on a single count or measurement variable

S-ID.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).

S-ID.2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

S-ID.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S-ID.4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.

Summarize, represent, and interpret data on two categorical and quantitative variables

S-ID.5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.

S-ID.6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

- a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.
- b. Informally assess the fit of a function by plotting and analyzing residuals.
- c. Fit a linear function for a scatter plot that suggests a linear association.

Interpret linear models

S-ID.7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

S-ID.8. Compute (using technology) and interpret the correlation coefficient of a linear fit.

S-ID.9. Distinguish between correlation and causation.

APPENDIX II

National Science Standards

The science content standards and their underlying abilities and concepts presented here are for grades 9–12. These are reprinted with permission from the **National Science Education Standards**, © 1995 by the National Academy of Sciences; courtesy of the National Academies Press, Washington, D.C.

A. Content Standard: Science as Inquiry

As a result of their activities in grades 9–12, all students should develop the ability to:

- A1. Identify questions and concepts that guide scientific investigation.
- A2. Design and conduct scientific investigations.
- A3. Use technology and mathematics to improve investigations and communications.
- A4. Formulate and revise scientific explanations and models using logic and evidence.
- A5. Recognize and analyze alternative explanations and models.
- A6. Communicate and defend a scientific argument.

B. Content Standard: Physical Science

As a result of their activities in grades 9–12, all students should develop an understanding of:

- B1. Structure of atoms.
- B2. Structure and properties of matter.
- B3. Chemical reactions.

- B4. Motions and forces.
- B5. Conservation of energy and increase in disorder.
- B6. Interactions of energy and matter.

C. Content Standard: Life Science

As a result of their activities in grades 9–12, all students should develop an understanding of:

- C1. The cell.
- C2. Molecular basis of heredity.
- C3. Biological evolution.
- C4. Interdependence of organisms.
- C5. Matter, energy, and organization in living systems.
- C6. Behavior of organisms.

D. Content Standard: Earth and Space Science

As a result of their activities in grades 9–12, all students should develop an understanding of:

- D1. Energy in the earth system.
- D2. Geochemical cycles.
- D3. Origin and evolution of the earth system.
- D4. Origin and evolution of the universe.

E. Content Standard: Science and Technology

As a result of their activities in grades 9–12, all students should develop:

- E1. Abilities of technological design.
- E2. Understanding about science and technology.

F. Content Standard: Science in Personal and Social Perspectives

As a result of their activities in grades 9–12, all students should develop understanding of:

- F1. Personal and community health.
- F2. Population growth.
- F3. Natural resources.
- F4. Environmental quality.
- F5. Natural and human-induced hazards.
- F6. Science and technology in local, national, and global challenges.

G. Content Standard: History and Nature of Science

*As a result of their activities in grades 9–12,
all students should develop understanding of:*

- G1. Science as human endeavor.
- G2. Nature of scientific knowledge.
- G3. Historical perspectives.

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APPENDIX III

National Standards in Social Studies

The social studies standards and performance expectations presented here are for high schools. They are organized by thematic strands according to information in the document entitled ***Expectations of Excellence: Curriculum Standards for Social Studies***, published by the National Council for the Social Studies, 1994. (© National Council for the Social Studies. www.socialstudies.org. Reprinted by permission.)

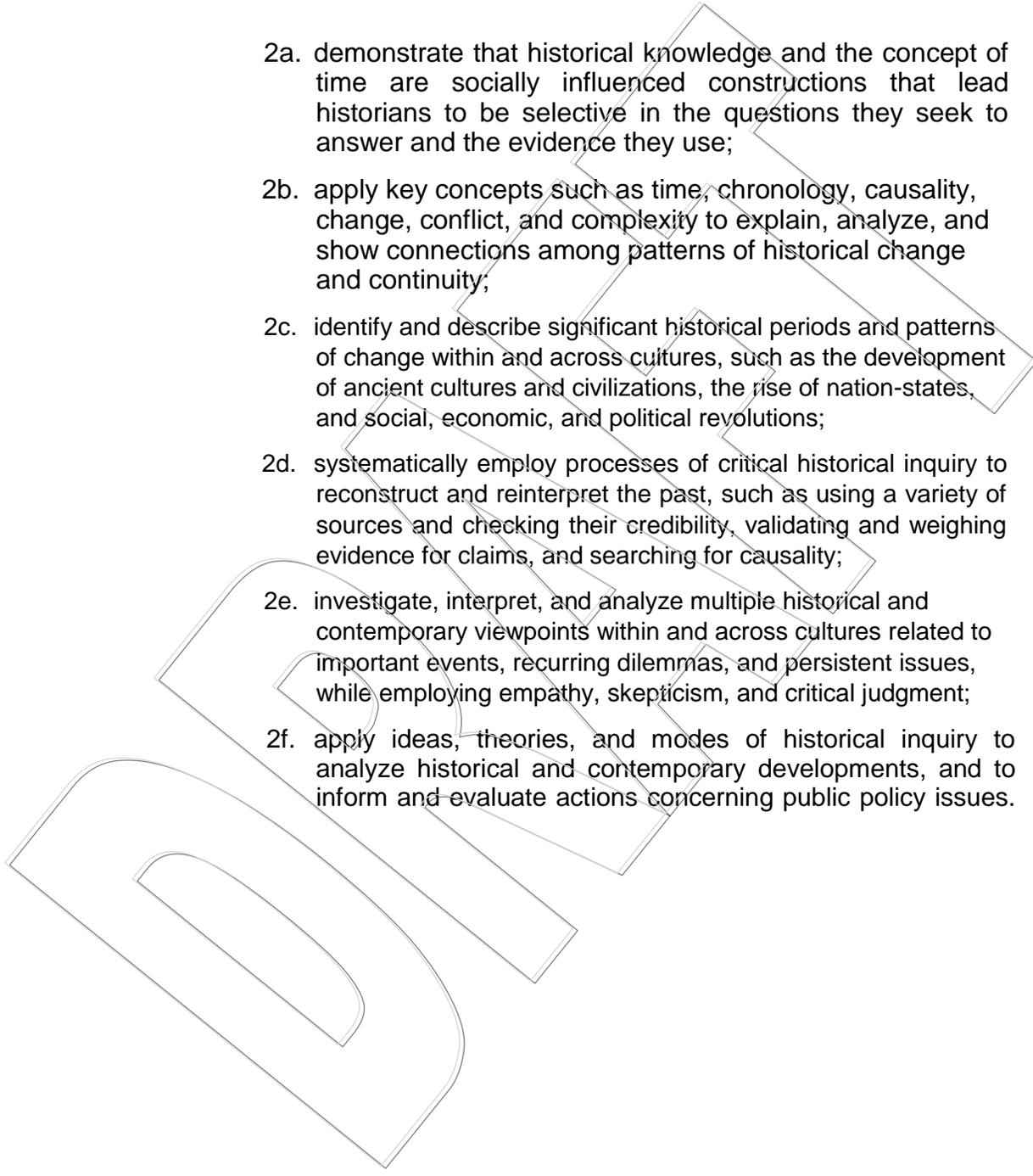
1. Thematic Strand: Culture

Social studies programs should include experiences that provide for the study of culture and cultural diversity, so that the learner can:

- 1a. analyze and explain the ways groups, societies, and cultures address human needs and concerns;
- 1b. predict how data and experiences may be interpreted by people from diverse cultural perspectives and frames of reference;
- 1c. apply an understanding of culture and an integrated whole that explains the functions and interactions of language, literature, the arts, traditions, beliefs and values, and behavior patterns;
- 1d. compare and analyze societal patterns for preserving and transmitting culture while adapting to environmental or social change;
- 1e. demonstrate the value of cultural diversity, as well as cohesion, within and across groups;
- 1f. interpret patterns of behavior reflecting values and attitudes that contribute or pose obstacles to cross-cultural understanding;
- 1g. construct reasoned judgments about specific cultural responses to persistent human issues;
- 1h. explain and apply ideas, theories, and modes of inquiry drawn from anthropology and sociology in the examination of persistent issues and social problems.

2. Thematic Strand: Time, Continuity, and Change

Social studies programs should include experiences that provide for the study of the ways human beings view themselves in and over time, so that the learner can:

- 
- 2a. demonstrate that historical knowledge and the concept of time are socially influenced constructions that lead historians to be selective in the questions they seek to answer and the evidence they use;
 - 2b. apply key concepts such as time, chronology, causality, change, conflict, and complexity to explain, analyze, and show connections among patterns of historical change and continuity;
 - 2c. identify and describe significant historical periods and patterns of change within and across cultures, such as the development of ancient cultures and civilizations, the rise of nation-states, and social, economic, and political revolutions;
 - 2d. systematically employ processes of critical historical inquiry to reconstruct and reinterpret the past, such as using a variety of sources and checking their credibility, validating and weighing evidence for claims, and searching for causality;
 - 2e. investigate, interpret, and analyze multiple historical and contemporary viewpoints within and across cultures related to important events, recurring dilemmas, and persistent issues, while employing empathy, skepticism, and critical judgment;
 - 2f. apply ideas, theories, and modes of historical inquiry to analyze historical and contemporary developments, and to inform and evaluate actions concerning public policy issues.

3. Thematic Strand: People, Places, and Environments

Social studies programs should include experiences that provide for the study of people, places, and environments, so that the learner can:

- 3a. refine mental maps of locales, regions, and the world that demonstrate understanding of relative location, direction, size, and shape;
- 3b. create, interpret, use, and synthesize information from various representations of the earth, such as maps, globes, and photographs;
- 3c. use appropriate resources, data sources, and geographic tools such as aerial photographs, satellite images, geographic information systems (GIS), map projects, and cartography to generate, manipulate, and interpret information such as atlases, data bases, grid systems, charts, graphs, and maps.
- 3d. calculate distance, scale, area, and density and distinguish spatial distribution patterns;
- 3e. describe, differentiate, and explain the relationships among various regional and global patterns of geographic phenomena such as land forms, soils, climate, vegetation, natural resources, and population;
- 3f. use knowledge of physical system changes such as seasons, climate and weather, and the water cycle to explain geographic phenomena;
- 3g. describe and compare how people create places that reflect culture, human needs, government policy, and current values and ideals as they design and build specialized buildings, neighborhoods, shopping centers, urban centers, industrial parks, and the like;
- 3h. examine, interpret, and analyze physical and cultural patterns and their interactions, such as land use, settlement patterns, cultural transmission of customs and ideas, and ecosystem changes;
 - 3i. describe and assess ways that historical events have been influenced by, and have influenced, physical and human geographic factors in local, regional, national, and global settings;
 - 3j. analyze and evaluate social and economic effects of environmental changes and crises resulting from phenomena such as floods, storms, and drought;
 - 3k. propose, compare, and evaluate alternative policies for the use of land and other resources in communities, regions, nations, and the world.

4. Thematic Strand: Individual Development and Identity

Social studies programs should include experiences that provide for the study of individual development and identity, so that the learner can:

- 4a. articulate personal connections to time, place, and social/cultural systems;
- 4b. identify, describe, and express appreciation for the influences of various

historical and contemporary cultures on an individual's daily life;

- 4c. describe the ways family, religion, gender, ethnicity, nationality, socioeconomic status, and other group and cultural influences contribute to the development of a sense of self;
- 4d. apply concepts, methods, and theories about the study of human growth and development, such as physical endowment, learning, motivation, behavior, perception, and personality;
- 4e. examine the interactions of ethnic, national, or cultural influences in specific situations or events;
- 4f. analyze the role of perceptions, attitudes, values, and beliefs in the development of personal identity;
- 4g. compare and evaluate the impact of stereotyping, conformity, acts of altruism, and other behaviors on individuals and groups;
- 4h. work independently and cooperatively within groups and institutions to accomplish goals;
- 4i. examine factors that contribute to and damage one's mental health and analyze issues related to mental health and behavioral disorders in contemporary society.

5. Thematic Strand: Individuals, Groups, and Institutions

Social studies programs should include experiences that provide for the study of interactions among individuals, groups, and institutions, so that the learner can:

- 5a. apply concepts such as role, status, and social class in describing the connections and interactions of individuals, groups, and institutions in society;
- 5b. analyze group and institutional influences on people, events, and elements of culture in both historical and contemporary settings;
- 5c. describe the various forms institutions take, and explain how they develop and change over time;
- 5d. identify and analyze examples of tensions between expressions of individuality and efforts used to promote social conformity by groups and institutions;
- 5e. describe and examine belief systems basic to specific traditions and laws in contemporary and historical movements;
- 5f. evaluate the role of institutions in furthering both continuity and change;
- 5g. analyze the extent to which groups and institutions meet individual needs and promote the common good in contemporary and historical settings;
- 5h. explain and apply ideas and modes of inquiry drawn from behavioral science and social theory in the examination of persistent issues and social problems.

6. Thematic Strand: Power, Authority, and Governance

Social studies programs should include experiences that provide for the study of how people create and change structures of power, authority, and governance, so that the learner can:

- 6a. examine persistent issues involving the rights, roles, and status of the individual in relation to the general welfare;
- 6b. explain the purpose of government and analyze how its powers are acquired, used, and justified;
- 6c. analyze and explain ideas and mechanisms to meet needs and wants of citizens, regulate territory, manage conflict, establish order and security, and balance competing conceptions of a just society;
- 6d. compare and analyze the ways nations and organizations respond to conflicts between forces of unity and forces of diversity;
- 6e. compare different political systems (their ideologies, structures, institutions, processes, and political cultures) with that of the United States, and identify representative political leaders from selected historical and contemporary settings;
- 6f. analyze and evaluate conditions, actions, and motivations that contribute to conflict and cooperation within and among nations;
- 6g. evaluate the role of technology in communications, transportation, information-processing, weapons development, or other areas as it contributes to or helps resolve conflicts;
- 6h. explain and apply ideas, theories, and modes of inquiry drawn from political science to the examination of persistent issues and social problems;
- 6i. evaluate the extent to which governments achieve their stated ideals and policies at home and abroad;
- 6j. prepare a public policy paper and present and defend it before an appropriate forum in school or community.

7. Thematic Strand: Production, Distribution, and Consumption

Social studies programs should include experiences that provide for the study of how people organize for the production, distribution, and consumption of goods and services, so that the learner can:

- 7a. explain how the scarcity of productive resources (human, capital, technological, and natural) requires the development of economic systems to make decisions about how goods and services are to be produced and distributed;
- 7b. analyze the role that supply and demand, prices, incentives, and profits play in determining what is produced and distributed in a competitive market system;
- 7c. consider the costs and benefits to society of allocating goods and services

- through private and public sectors;
- 7d. describe relationships among the various economic institutions that comprise economic systems such as households, business firms, banks, government agencies, labor unions, and corporations;
 - 7e. analyze the role of specialization and exchange in economic processes;
 - 7f. compare how values and beliefs influence economic decisions in different societies;
 - 7g. compare basic economic systems according to how rules and procedures deal with demand, supply, prices, the role of government, banks, labor and labor unions, savings and investments, and capital;
 - 7h. apply economic concepts and reasoning when evaluating historical and contemporary social developments and issues;
 - 7i. distinguish between the domestic and global economic systems, and explain how the two interact;
 - 7j. apply knowledge of production, distribution, and consumption in the analysis of a public issue such as the allocation of health care or the consumption of energy, and devise an economic plan for accomplishing a socially desirable outcome related to that issue;
 - 7k. distinguish between economics as a field of inquiry and the economy.

8. Thematic Strand: Science, Technology, and Society

Social studies programs should include experiences that provide for the study of relationships among science, technology, and society, so that the learner can:

- 8a. identify and describe both current and historical examples of the interaction and interdependence of science, technology, and society in a variety of cultural settings;
- 8b. make judgments about how science and technology have transformed the physical world and human society and our understanding of time, space, place, and human-environment interactions;
- 8c. analyze how science and technology influence the core values, beliefs, and attitudes of society, and how the core values, beliefs, and attitudes of society shape scientific and technological change;
- 8d. evaluate various policies that have been proposed as ways of dealing with social changes resulting from new technologies, such as genetically engineered plants and animals;
- 8e. recognize and interpret varied perspectives about human societies and the physical world using scientific knowledge, ethical standards, and technologies from diverse world cultures;
- 8f. formulate strategies and develop policies for influencing public discussions associated with technology-society issues, such as the greenhouse effect.

9. Thematic Strand: Global Connections

Social studies programs should include experiences that provide for the study of global connections and interdependence, so that the learner can:

- 9a. explain how language, art, music, belief systems, and other cultural elements can facilitate global understanding or cause misunderstanding;
- 9b. explain conditions and motivations that contribute to conflict, cooperation, and interdependence among groups, societies, and nations;
- 9c. analyze and evaluate the effects of changing technologies on the global community;
- 9d. analyze the causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues, such as health, security, resource allocation, economic development, and environmental quality;
- 9e. analyze the relationships and tensions between national sovereignty and global interests in such matters as economic development, nuclear and other weapons, use of natural resources, and human rights;
- 9f. analyze and formulate policy statements demonstrating an understanding of concerns, standards, issues, and conflicts related to universal human rights;
- 9g. describe and evaluate the role of international and multinational organizations in the global arena;
- 9h. illustrate how individual behaviors and decisions connect with global systems.

10. Thematic Strand: Civic Ideals and Practices

Social studies programs should include experiences that provide for the study of the ideals, principles, and practices of citizenship in a democratic republic, so that the learner can:

- 10a. explain the origins and interpret the continuing influence of key ideals of the democratic republican form of government, such as individual human dignity, liberty, justice, equality, and the rule of law;
- 10b. identify, analyze, interpret, and evaluate sources and examples of citizens' rights and responsibilities;
- 10c. locate, access, analyze, organize, synthesize, evaluate, and apply information about selected public issues—identifying, describing, and evaluating multiple points of view;
- 10d. practice forms of civic discussion and participation consistent with the ideals of citizens in a democratic republic;
- 10e. analyze and evaluate the influence of various forms of citizen action on public policy;
- 10f. analyze a variety of public policies and issues from the perspective of

formal and informal political factors;

- 10g. evaluate the effectiveness of public opinion in influencing and shaping public policy development and decision-making;
- 10h. evaluate the degree to which public policies and citizen behaviors reflect or foster the stated ideals of a democratic republican form of government;
- 10i. construct a policy statement and an action plan to achieve one or more goals related to an issue of public concern;
- 10j. participate in activities to strengthen the “common good,” based upon careful evaluation of possible options for citizen action

APPENDIX 1V

Common Core of States Standards in English Language Arts

Agriculture, Food and Natural Resources Foundation Skills

Pathway Content Standard: The student will demonstrate competence in the application of scientific principles and practices to all areas of agriculture.

CT Agriculture, Food and Natural Resources Foundation Skills Standards 9-12	Connecticut State Standards English Language Arts
CT-FS.01.01. Performance Indicator: Safety with Contaminants and Equipment: Understand the concepts and procedures of handling contaminants, chemicals and related equipment in an agricultural setting.	
Level 1	
CT-FS.01.01.01.a. Interpret labels. (B13; B18 Aquaculture).*	RST.9-10.4; RST.9-10.7
CT-FS.01.01.02.a. Understand safety precautions used when handling, measuring, mixing, disposing and cleaning of chemicals and related equipment (B15; B20 Aquaculture).*	RST.9-10.3; LS. 9-10.5
CT-FS.01.01.03.a. Understand environmental protection laws and policy (B17; B22 Aquaculture).*	RST.9-10.4; RST.9-10.7
Level 2	
CT-FS.01.01.01.b. Read and interpret Material Safety Data Sheets (MSDS) (B14; B19 Aquaculture).*	RST.11-12.4; WHST.11-12.9
CT-FS.01.01.02.b. Explain proper use of safety equipment in agriculture (B16; B21 Aquaculture).*	RST.11-12.3; RST.11-12.4; LS. 11-12.5; WHST.11-12.4; L.11-12.2; L.11-12.6
Level 3	
CT-FS.02.01. Performance Indicator: Understand the use and application of information-based technologies necessary for career success in agriculture.	
Level 1	
CT-FS.02.01.01.a. Describe basic computer and software systems as they apply to agriculture (C18; C23 Aquaculture).*	RST.9-10.1
Level 2	
CT-FS.02.01.01.b. Use career multimedia technology and software as it relates to agriculture (C19; C24 Aquaculture).*	RST.11-12.1; SL.11-12.5
Level 3	
CT-FS.03.01. Performance Indicator: Understand the sequence of the channels of distribution and marketing including their impact on the agriculture industry.	
Level 1	
CT-FS.03.01.01.a. Understand supply and demand principles in Agriculture, Food, and Natural Resource systems. (D20; D25 Aquaculture).*	RST.9-10.7

CT Agriculture, Food and Natural Resources Foundation Skills Standards 9-12	Connecticut State Standards English Language Arts
CT-FS.03.01.02.a. Define the concept of profit and loss in agricultural business. (D22; D27 Aquaculture).*	RST.9-10.7; WHST.9-10.4
CT-FS.03.01.03.a. Explain the impact of positive customer/client relations (D24; D29 Aquaculture).*	L.9-10.2; L.9-10.6; WHST.9-10.7
Level 2	
CT-FS.03.01.01.b. Identify strategies frequently employed in agricultural marketing programs. (D21; D26 Aquaculture).*	RST.11-12.5; SL.9-10.5; L.11-12.2; L.11-12.6
CT-FS.03.01.02.b. Understand the impact of advertising media on agriculture (D23; D28 Aquaculture).*	RST.11-12.1; RST.11-12.4; SL.11-12.4; SL.11-12.5
CT-FS.04.01. Performance Indicator: Observe required regulations to maintain/improve safety, health and environmental management systems	
Level 1	
CT-FS.04.01.01.a. Examine major health, safety, and environmental management system components in AFNR organizations.	RST.9-10.2
Level 2	
CT-FS.04.01.01.b. Identify the benefits of improved health, safety, and environmental performance to AFNR organizations in current geographical area.	RST.11-12.7; RST.11-12.8; RST.11-12.9; SL.11-12.5
Level 3	
CT-FS.04.01.01.c. Assess how AFNR organizations promote improved health, safety, and environmental performance and suggest plans for improvement.	
CT-FS.04.02. Performance Indicator: Develop a plan to maintain and improve health, safety and environmental compliance and performance.	
Level 1	
CT-FS.04.02.01.a. Use proper safety practices/personal protective equipment.	
Level 2	
CT-FS.04.02.01.b. Develop plans to improve health, safety and environmental performance	WHST.11-12.9; RST.11-12.9; L.11-12.6; L.11-12.6
Level 3	
CT-FS.04.02.01.c. Educate other workers to improve health, safety, and environmental performance in a safe manner.	
CT-FS.04.03 Performance Indicator: Provide health, safety, and environmental operating guidelines	
Level 1	
CT-FS.04.03.01.a. Demonstrate the importance of safety, health, and environmental practices in the workplace.	RST.9-10.3; SL.9-10.5
Level 2	
CT-FS.04.03.01.b. Develop a pollution/waste prevention plan to enhance safety, health, and environmental practices in the workplace.	WHST.11-12.7, WHST.11-12.8, WHST.11-12.9; RST.11-12.7, RST.11-12.8, RST.11-12.9; SL.11-12.5; L.11-12.2;

CT Agriculture, Food and Natural Resources Foundation Skills Standards 9-12	Connecticut State Standards English Language Arts
	L.11-12.6
Level 3 CT-FS.04.03.01.c. Establish a set of health, safety, and environmental principles to ensure a high level of performance.	
CT-FS.04.04. Performance Indicator: Examine health risks associated with a particular skill to better develop personnel safety guidelines.	
Level 1 CT-FS.04.04.01.a. Determine the level of contamination or injury that would be considered a risk as associated with a specific job or activity.	RST.9-10.7; SL.9-10.5
Level 2 CT-FS.04.04.01.b. Assess the safety priorities for the level of contamination or injury.	RST.11-12.8; SL.11-12.5; SL.11-12.6
Level 3 CT-FS.04.04.01.c. Implement a plan to mitigate the level of contamination or injury identified in the workplace	
CT-FS.05.01. Performance Indicator: Apply safety/health practices to AFNR worksites	
Level 1 CT-FS.05.01.01.a. Implement the health and safety policies and procedures relevant to AFNR careers.	SL.9-10.5
Level 2 CT-FS.05.01.01.b. Use appropriate personal protective equipment for a given task.	SL.11-12.5; RST.11-12.1
Level 3 CT-FS.05.01.01.c. Orient a group on safety measures based on the prescribed safety guidelines.	
CT-FS.05.02. Performance Indicator: Demonstrate recognized first aid knowledge and procedures to show how they are used by AFNR industries.	
Level 1 CT-FS.05.02.01.a. Inform others how to avoid placing oneself in hazardous work situations.	SL.9-10.5
Level 2 CT-FS.05.02.01.b. Use first aid knowledge and procedures relevant to a particular situation.	SL.11-12.5; RST.11-12.1
Level 3 CT-FS.05.02.01.c. Complete a recognized industry-level first aid training program	
CT-FS.05.03. Performance Indicator: Follow appropriate procedures in case of an emergency.	
Level 1 CT-FS.05.03.01.a. Evaluate the emergency response procedures for a natural disaster.	SL.9-10.5; RST.9-10.9

CT Agriculture, Food and Natural Resources Foundation Skills Standards 9-12	Connecticut State Standards English Language Arts
Level 2	
CT-FS.05.03.01.b. Develop various emergency response plan requirements for a facility.	SL.11-12.5; L.11-12.2; L.11-12.6; RST.11-12.7, RST.11-12.8, RST.11-12.9
Level 3	
CT-FS.05.03.01.c. Communicate the appropriate responses for medical emergencies by following the approved procedures.	
CT-FS.05.04. Performance Indicator: Assess workplace safety	
Level 1	
CT-FS.05.04.01.a. Research applicable regulatory and safety standards (e.g., MSDS, bioterrorism).	SL.9-10.5; RST.9-10.2
CT-FS.05.04.02.a. Handle chemicals and equipment in a safe and appropriate manner.	SL.9-10.5
Level 2	
CT-FS.05.04.01.b. Use safety procedures to comply with regulatory and safety standards.	SL.11-12.5; RST.11-12.1
CT-FS.05.04.02.b. Maintain AFNR facilities to promote health and safety.	
Level 3	
CT-FS.05.04.01.c. Apply general workplace safety precautions/procedures.	
CT-FS.05.04.02.c. Evaluate general workplace safety precautions/procedures for compliance with regulations.	
CT-FS.06.01. Performance Indicator: Evaluate and select the appropriate tool to perform a given task.	
Level 1	
CT-FS.06.01.01.a. Identify standard tools, equipment, and safety procedures related to a specific task.	SL.9-10.5; RST.9-10.5
CT-FS.06.01.02.a. Follow operating instructions related to specific tools and equipment needed to complete a task.	
Level 2	
CT-FS.06.01.01.b. Set up/adjust tools and equipment related to complete a specific task.	SL.11-12.4; SL.11-12.5; SL.11-12.6
CT-FS.06.01.02.b. Demonstrate appropriate operation, storage, and maintenance techniques for tools and equipment.	SL.11-12.5
Level 3	
CT-FS.06.01.01.c. Use tools and equipment appropriately to complete a specific task.	
CT-FS.06.01.02.c. Devise a maintenance plan or schedules for tools and equipment.	
CT-FS.06.02. Performance Indicator: Use appropriate protective equipment and handle AFNR tools and equipment to demonstrate safe and proper use of the tools and equipment.	
Level 1	
CT-FS.06.02.01.a. Use the appropriate procedures for the use and operation of specific tools and equipment.	SL.9-10.5; RST.9-10.1
Level 2	
CT-FS.06.02.01.b. Demonstrate safety precautions when using tools for a specific task around bystanders.	SL.11-12.5; RST.11-12.3

CT Agriculture, Food and Natural Resources Foundation Skills Standards 9-12	Connecticut State Standards English Language Arts
Level 3	
CT-FS.06.02.01.c. Operate applicable AFNR equipment and vehicles safely.	
CT-FS.06.03. Performance Indicator: Maintain tools for efficient use.	
Level 1	
CT-FS.06.03.01.a. Describe the conditions that cause the need for tool maintenance.	SL.9-10.5; RST.9-10.1
Level 2	
CT-FS.06.03.01.b. Demonstrate how to replace tool parts and components as needed	SL.11-12.5; RST.11-12.3
Level 3	
CT-FS.06.03.01.c. Develop and update a preventive maintenance schedule.	
CT-FS.10.01. Performance Indicator: Apply economic principles to AFNR systems (e.g., supply, demand and profit).	
Level 1	
CT-FS.10.01.01.a. Calculate the effect of compound interest on AFNR investments.	
Level 2	
CT-FS.10.01.01.b. Describe the economic impacts of natural resource preservation vs. use of the resource.	L.11-12.2; L.11-12.6; RST.11-12.1; WHST.11-12.4
Level 3	
CT-FS.10.01.01.c. Describe the impacts of AFNR decisions on global markets and environmental health.	
CT-FS.10.02. Performance Indicator: Apply skills with computer software to accomplish a variety of business activities.	
Level 1	
CT-FS.10.02.01.a. Demonstrate basic computer and software systems skills.	SL.9-10.5; RST.9-10.3
Level 2	
CT-FS.10.02.01.b. Use basic software systems such as spreadsheet and word processing to complete a task.	SL.11-12.4; SL.11-12.5; RST.11-12.1
Level 3	
CT-FS.10.02.01.c. Use diagnostic software.	
CT-FS.10.03. Performance Indicator: Use technology to demonstrate the ability to network and interface with technology.	
Level 1	
CT-FS.10.03.01.a. Use the technological systems to acquire information related to AFNR.	SL.9-10.5; RST.9-10.1
Level 2	
CT-FS.10.03.01.b. Show technical competence for efficient workplace communications.	SL.9-10.5
Level 3	
CT-FS.10.03.01.c. Demonstrate the use of technology in linking information from various sources.	
CT-FS.10.01. Performance Indicator: Examine new technologies to project their impact in the global market of AFNR.	
Level 1	

CT Agriculture, Food and Natural Resources Foundation Skills Standards 9-12	Connecticut State Standards English Language Arts
CT-FS.10.01.01.a. Apply the use of various scientific measurement and conversions to AFNR systems.	
Level 2	
CT-FS.10.01.01.b. Discuss the use of mechatronic-FS (such as lasers and robotics and their impact on AFNR systems.	SL.11-12.5
Level 3	
CT-FS.10.01.01.c. Evaluate the importance of new and emerging communication systems and how they impact AFNR systems.	
CT-FS.10.02. Performance Indicator: Relate technology advancements to the need for Continuing Education/Career Development.	
Level 1	
CT-FS.10.02.01.a. Utilize historical data, technology and career training to predict market trends.	SL.9-10.5; RST.9-10.1
Level 2	
CT-FS.10.02.01.b. Apply emerging technology and career training to meet market demands.	
Level 3	
CT-FS.10.02.01.c. Research emerging technologies and the opportunities they may create within the AFNR systems.	
CT-FS.11.01. Performance Indicator: Recognize the questions and theory needed to guide scientific investigations.	
Level 1	
CT-FS.11.01.01.a. Formulate a testable hypothesis.	
Level 2	
CT-FS.11.01.01.b. Design an experiment to test a hypothesis.	L.11-12.2; L.11-12.6
Level 3	
CT-FS.11.01.01.c. Demonstrate procedures and a conceptual understanding of scientific investigation.	
CT-FS.11.02. Performance Indicator: Design and conduct a scientific investigation	
Level 1	
CT-FS.11.02.01.a. Design an experiment or scientific inquiry for a specific project.	L.9-10.2; L.9-10.6
Level 2	
CT-FS.11.02.01.b. Implement an experimental design to test a formulated hypothesis.	
Level 3	
CT-FS.11.02.01.c. Propose additional studies based on the results of an experiment.	
CT-FS.12.03. Performance Indicator: Flexibility / Adaptability: Describe traits that enable one to be capable and willing to accept change.	
Level 1	
CT-FS.12.03.01.a. Research current and emerging technologies in AFNR.	SL.9-10.5; L.9-10.2; L.9-10.6; RST.9-10.2
CT-FS.12.03.02.a. Select the appropriate process to initiate effective change for a given situation.	
CT-FS.12.03.03.a. Assess to the value of providing feedback.	RST.9-10.8
Level 2	
CT-FS.12.03.01.b. Analyze the advantages and disadvantages of current	SL.9-10.5; L.11-12.2; L.11-

CT Agriculture, Food and Natural Resources Foundation Skills Standards 9-12	Connecticut State Standards English Language Arts
and emerging technologies in AFNR activities.	12.6; RST.11-12.5; RST.11-12.6
CT-FS.12.03.02.b. Assess the benefits of using the change process.	L.11-12.2; L.11-12.6; RST.11-12.5; RST.11-12.6
CT-FS.12.03.03.b. Differentiate between positive and negative constructive feedback and realize the importance of both.	L.11-12.2; L.11-12.6; RST.11-12.6
Level 3	
CT-FS.12.03.01.c. Conduct a workplace study to assess the benefits to adapting emerging technologies.	
CT-FS.12.03.02.c. Evaluate strategies that can be used to manage change within the workplace.	
CT-FS.12.03.03.c. Respond to feedback to improve a situation, skill or performance.	
CT-FS.13.01. Performance Indicator: Examine performance and goals to appreciate organizations and industries within AFNR.	
Level 1	
CT-FS.13.01.01.a. Examine performance and goals to appreciate professional organizations and industries within AFNR.	RST.9-10.1
Level 2	
CT-FS.13.01.01.b. Explain the major guidelines used by AFNR professional organizations to manage and improve performance.	L.11-12.2; L.11-12.6
Level 3	
CT-FS.13.01.01.c. Examine economic, social and technological changes and spotlights their impact on AFNR professional organizations and the industry.	
CT-FS.14.01. Performance Indicator: Manage organizational structures and processes to better serve customers.	
Level 1	
CT-FS.14.01.01.a. List ways an organization can be evaluated based on its customer satisfaction and service operations.	WHST.9-10.4; L.9-10.2; L.9-10.6
Level 2	
CT-FS.14.01.01.b. Explain how organization performance including customer satisfaction and service/ operations performance can be improved.	SL.11-12.4; L.11-12.2; L.11-12.6
Level 3	
CT-FS.14.01.01.c. Implement a plan to manage relationships with both internal and external customers.	
CT-FS.14.02. Performance Indicator: Examine the components of the AFNR systems and address their maintenance requirements.	
Level 1	
CT-FS.14.02.01.a. Develop goals and objectives for each system to manage organizational activities more effectively.	WHST.9-10.4; SL.9-10.5; L.9-10.2; L.9-10.6; RST.9-10.9
Level 2	
CT-FS.14.02.01.b. Operate technical tools to access, manage, integrate, evaluate and create information.	WHST.9-10.6; SL.11-12.4, SL.11-12.5, SL.11-12.6; RST.11-12.3
Level 3	
CT-FS.14.02.01.c. Implement management plans to improve the AFNR systems.	
CT-FS.14.03. Performance Indicator: Research geographical data related	

CT Agriculture, Food and Natural Resources Foundation Skills Standards 9-12	Connecticut State Standards English Language Arts
to AFNR systems.	
Level 1	
CT-FS.14.03.01.a. Present resource data in graphic format.	WHST.9-10.6; SL.9-10.5
CT-FS.14.03.02.a. Utilize the different types of AFNR systems related to various geographical areas.	SL.11-12.5; RST.9-10.7; RST.9-10.8
Level 2	
CT-FS.14.03.01.b. Interpret resource data in graphic format.	WHST.9-10.6; SL.9-10.5; L.9-10.2; L.9-10.6; RST.11-12.4
CT-FS.14.03.02.b. Explore how AFNR systems differ across geographical areas.	RST.11-12.7; SL.11-12.4; SL.11-12.5
Level 3	
CT-FS.14.03.01.c. Use computer systems to present trends in resource data.	
CT-FS.14.03.02.c. Evaluate the effects of implementing an AFNR system in a different geographical area.	

Leadership Skills

Pathway Content Standard: The student will demonstrate competence in the application of leadership, personal growth and career success skills necessary for a chosen profession while effectively contributing to society.

Leadership Skills Standards 9-12	Connecticut State Standards English Language Arts
CT-LS.01.01. Performance Indicator: Action: Exhibit the skills and competencies needed to achieve a desired result.	
Level 1	
CT-LS.01.01.01.a. Work productively with a group or independently.	
CT-LS.01.01.02.a. Create a task analysis.	WHST.9-10.4
CT-LS.01.01.03.a. Exhibit good planning skills for a specific task or situation.	
CT-LS.01.01.04.a. Explore available resources to assist in meeting project needs.	WHST.9-10.8
CT-LS.01.01.05.a. Assess the physical, financial and professional risks associated with a particular task.	
CT-LS.01.01.06.a. Identify the strengths/talents of team members needed to achieve a desired task.	RST.9-10.3
CT-LS.01.01.07.a. Set personal goals using the SMART goals method (Specific, Measurable, Approved by you, Realistic, Time-stamped).	WHST.9-10.4
Level 2	
CT-LS.01.01.01.b. Demonstrate the ability to complete a task without assistance.	
CT-LS.01.01.02.b. Create measurable objectives for a given situation.	WHST.11-12.4
CT-LS.01.01.03.b. Assess individual strengths and weaknesses in planning.	
CT-LS.01.01.04.b. Use appropriate and reliable resources to complete an action or project.	WHST.11-12.8
CT-LS.01.01.05.b. Create a plan for performing a job that will minimize physical, financial and professional risks.	WHST.11-12.4
CT-LS.01.01.06.b. Assign project parts equitably amongst team members to achieve a given task.	
CT-LS.01.01.07.b. Use a variety of strategies to evaluate goals (e.g., observes, apply, and demonstrate).	
Level 3	
CT-LS.01.01.01.c. Work independently and in group settings to accomplish a task.	
CT-LS.01.01.02.c. Assess outcomes to determine success for a task.	
CT-LS.01.01.03.c. Implement an effective project plan.	
CT-LS.01.01.04.c. Create resources to complete an action or project.	
CT-LS.01.01.05.c. Implement a plan that minimizes physical, financial, and professional risks and analyzes results.	
CT-LS.01.01.06.c. Develop strengths and talents of team members so that all can achieve success.	
CT-LS.01.01.07.c. Evaluate actions taken and make appropriate modifications to personal goals.	
CT-LS.01.02. Performance Indicator: Relationships: Build a constituency through listening, coaching, understanding and appreciating others.	

Leadership Skills Standards 9-12	Connecticut State Standards English Language Arts
Level 1	
CT-LS.01.02.01.a. Explain human relation skills such as compassion, empathy, unselfishness, trustworthiness, reliability and being friendly.	SL.9-10.4
CT-LS.01.02.02.a. Engage in a conversation with others to identify their interests and aspirations.	SL.9-10.1
CT-LS.01.02.03.a. Identify the steps/strategies to successfully coach/mentor others.	RST.9-10.3
CT-LS.01.02.04.a. Identify characteristics CT-LS of effective teams.	
Level 2	
CT-LS.01.02.01.b. Determine human relation skills characteristic CT-LS of people who exhibit compassion, empathy, unselfishness, trustworthiness, reliability and being friendly.	
CT-LS.01.02.02.b. Utilize communication skills to collaborate in a group setting.	SL.11-12.1
CT-LS.01.02.03.b. Perform the steps/strategies to successfully coach/mentor others.	
CT-LS.01.02.04.b. Establish team ground rules for expected individual behaviors on the team.	WHST.11-12.4
Level 3	
CT-LS.01.02.01.c. Demonstrate human relation skills including compassion, empathy, unselfishness, trustworthiness, reliability and being friendly to co-workers.	
CT-LS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.	
CT-LS.01.02.03.c. Manage a coaching/mentoring program.	
CT-LS.01.02.04.c. Evaluate the effectiveness of team members.	
CT-LS.01.03. Performance Indicator: Vision: Establish a clear image of what the future should look like.	
Level 1	
CT-LS.01.03.01.a. Identify the benefits of developing vision.	
CT-LS.01.03.02.a. Use various conceptualizing tools.	
CT-LS.01.03.03.a. Analyze the risks and rewards of new experiences.	
CT-LS.01.03.04.a. Describe techniques used to build consensus.	SL.9-10.4
Level 2	
CT-LS.01.03.01.b. Utilize visioning skills to develop a plan.	
CT-LS.01.03.02.b. Compare conceptualizing tools to use in a given situation.	
CT-LS.01.03.03.b. Analyze a case study involving a new experience for risk and rewards.	WHST.11-12.9
CT-LS.01.03.04.b. Demonstrate consensus building.	
Level 3	
CT-LS.01.03.01.c. Develop vision statements and plans for an organization.	
CT-LS.01.03.02.c. Create a plan of action to complete a task based on a conceptualized idea.	
CT-LS.01.03.03.c. Conduct a self-evaluation for personal reactions to new experiences.	
CT-LS.01.04.05.c. Lead a meeting or activity that engages all participants in the process.	
CT-LS.01.04. Performance Indicator: Character: Conduct professional and personal activities based on virtues.	

Leadership Skills Standards 9-12	Connecticut State Standards English Language Arts
Level 1	
CT-LS.01.04.01.a. Analyze a case study where integrity was demonstrated.	WHST.9-10.9
CT-LS.01.04.02.a. Describe personal values.	SL.9-10.4
CT-LS.01.04.03.a. Identify the consequences of personal actions.	RST.9-10.3
CT-LS.01.04.04.a. Explain the benefits of mutual respect.	SL.9-10.4
CT-LS.01.04.05.a. Practice self-discipline.	
CT-LS.01.04.06.a. Describe the benefits of serving others.	SL.9-10.4
Level 2	
CT-LS.01.04.01.b. Explain a personal decision where integrity played a role in the decision.	SL.11-12.4
CT-LS.01.04.02.b. Demonstrate the benefits of living by positive values.	
CT-LS.01.04.03.b. Assess the alternative outcome of specific actions.	
CT-LS.01.04.04.b. Analyze how respect is given.	
CT-LS.01.04.05.b. Differentiate between habits, practices and behaviors consistent with principles of self-discipline.	
CT-LS.01.04.06.b. Develop personal goals that include service to others.	WHST.9-10.4
Level 3	
CT-LS.01.04.01.c. Perform tasks with integrity.	
CT-LS.01.04.02.c. Assess personal values.	
CT-LS.01.04.03.c. Analyze the causes for team members to accept or reject responsibility.	
CT-LS.01.04.04.c. Demonstrate respect for others.	
CT-LS.01.04.05.c. Analyze one's level of self-discipline and causes for lack of self-discipline.	
CT-LS.01.04.06.c. Evaluate professional and personal values and how they are applied in the service to others.	
CT-LS.01.05. Performance Indicator: Awareness: Desire purposeful understanding related to professional and personal activities.	
Level 1	
CT-LS.01.05.01.a. Discuss trends and issues important to the community.	SL.9-10.4
CT-LS.01.05.02.a. Identify civic leadership role opportunities.	
CT-LS.01.05.03.a. Explain benefits and challenges of working in a diverse group.	SL.9-10.4
Level 2	
CT-LS.01.05.01.b. Analyze the impact of trends and issues on the community.	
CT-LS.01.05.02.b. Demonstrate responsible citizenship.	
CT-LS.01.05.03.b. Engage in activities to help develop personal awareness of diversity.	
Level 3	
CT-LS.01.05.01.c. Articulate current issues those are important to the local, state, national and global communities.	
CT-LS.01.05.02.c. Perform leadership tasks associated with citizenship.	
CT-LS.01.05.03.c. Plan an activity that promotes appreciation of diversity.	
CT-LS.01.06. Performance Indicator: Continuous Improvement: Pursue learning and growth opportunities related to professional and personal aspirations.	
Level 1	
CT-LS.01.06.01.a. Explain the reasons for having a leadership/personal	SL.9-10.4

Leadership Skills Standards 9-12	Connecticut State Standards English Language Arts
growth plan.	
CT-LS.01.06.02.a. Describe the role and purpose of a personal mentor.	SL.9-10.4
CT-LS.01.06.03.a. Identify the different types of problem solving models and their applicability to specific situations.	WHST.9-10.9
CT-LS.01.06.04.a. Use various emerging technologies to enhance a program or project.	WHST.9-10.6
CT-LS.01.06.05.a. Describe the value of being a life-long learner and the need for continuous development.	SL.9-10.4
Level 2	
CT-LS.01.06.01.b. Develop a plan that includes specific goals for leadership and personal growth.	WHST.11-12.4
CT-LS.01.06.02.b. Identify areas where a personal mentor could be helpful.	
CT-LS.01.06.03.b. Utilize a problem-solving model to solve a given problem.	WHST.11-12.9
CT-LS.01.06.04.b. Evaluate the effectiveness of current technologies.	WHST.11-12.6
CT-LS.01.06.05.b. Assess personal motivations and their impact on acquiring new knowledge and skills.	
Level 3	
CT-LS.01.06.01.c. Implement a leadership and personal growth plan.	
CT-LS.01.06.02.c. Serve as a mentor for others.	
CT-LS.01.06.03.c. Use problem solving strategies to solve a professional or personal issue.	
CT-LS.01.06.04.c. Make recommendations to adopt new emerging technologies.	
CT-LS.01.06.05.c. Implement a plan to develop new knowledge and skills related to professional and personal aspirations.	
CT-LS.02.01. Performance Indicator: Physical Growth: Address personal health by understanding, respecting and managing your body's needs.	
Level 1	
CT-LS.02.01.01.a. Identify how healthy and unhealthy food affects one's body.	WHST.9-10.9
CT-LS.02.01.02.a. Describe the benefits, risks and opportunities associated with being physically fit.	SL.9-10.4
CT-LS.02.01.03.a. Describe practices that must be maintained to achieve long-term health.	SL.9-10.4
Level 2	
CT-LS.02.01.01.b. Create a balanced menu to ensure appropriate proportions of desired nutritional elements.	WHST.11-12.4
CT-LS.02.01.02.b. Implement a plan for respecting one's body.	WHST.11-12.7
CT-LS.02.01.03.b. Implement a plan to achieve long-term health.	WHST.11-12.7
Level 3	
CT-LS.02.01.01.c. Practice healthy eating habits.	
CT-LS.02.01.02.c. Make recommendations or changes to a personal fitness program regimen.	
CT-LS.02.01.03.c. Evaluate personal lifestyle as related to long-term health.	
CT-LS.02.02. Performance Indicator: Social Growth: Interact with others in a manner that respects the differences of a diverse and changing society.	
Level 1	

Leadership Skills Standards 9-12	Connecticut State Standards English Language Arts
CT-LS.02.02.01.a. Discover the different cultures that exist in one's community.	
CT-LS.02.02.02.a. Demonstrate proper conduct and appearances for various settings.	
CT-LS.02.02.03.a. Identify the skills needed to develop a professional relationship.	WHST.9-10.9
Level 2	
CT-LS.02.02.01.b. Compare and contrast the customs of different cultures.	
CT-LS.02.02.02.b. Apply the skills required to present one appropriately in various settings.	
CT-LS.02.02.03.b. Exhibit the behaviors needed for developing and maintaining a professional relationship.	
Level 3	
CT-LS.02.02.01.c. Engage in a project that educates others about different cultures from within the community.	
CT-LS.02.02.02.c. Present one appropriately in various settings.	
CT-LS.02.02.03.c. Identify ways to develop and maintain professional relationships to enhance career success (E28; E33 Aquaculture).*	
CT-LS.02.03. Performance Indicator: Professional Growth: Develop awareness and apply skills necessary for achieving career success.	
Level 1	
CS.02.03.01.a. Explore various career interests/options.	
CT-LS.02.03.02.a. Chart the components to creating a balanced work/life plan.	
CT-LS.02.03.03.a. Identify the employability skills required for various careers in agriculture (E25; E30 Aquaculture).*	
Level 2	
CT-LS.02.03.01.b. Make decisions to plan for a personal career.	
CT-LS.02.03.02.b. Determine the level of non-essential actions/tasks related to personal and work life.	
CT-LS.02.03.03.b. Develop skills required for a specific career.	
Level 3	
CT-LS.02.03.01.c. Implement a plan to achieve career goals and priorities.	
CT-LS.02.03.02.c. Balance personal and work responsibilities.	
CT-LS.02.03.03.c. Demonstrate employability skills for a specific career.	
CT-LS.02.04. Performance Indicator: Professional Growth: Create resumes and cover letters for employment opportunities.	
Level 1	
CT-LS.02.04.03.a. Describe the purpose of a resume and cover letter. (E26; E31 Aquaculture).*	SL.9-10.4
Level 2	
CT-LS.02.04.03.b. Analyze the steps in a job search including preparing the cover letter, resume and application, and participating in the interview process (E27; E32 Aquaculture).*	RST.11-12.3
Level 3	
CT-LS.02.04.01.c. Create a resume and cover letter for employment.	
CT-LS.02.04. Performance Indicator: Mental Growth: Demonstrate the effective application of reasoning, thinking, and coping skills.	
Level 1	

Leadership Skills Standards 9-12	Connecticut State Standards English Language Arts
CT-LS.02.04.01.a. Describe the skills necessary to think critically and creatively.	SL.9-10.4
CT-LS.02.04.02.a. Explore tools used in creative problem-solving.	
CT-LS.02.04.03.a. Discuss the skills and techniques needed to negotiate effectively.	SL.9-10.4
Level 2	
CT-LS.02.04.01.b. Discuss the benefits of thinking critically and creatively.	SL.11-12.4
CT-LS.02.04.02.b. Analyze problems that were solved well and problems that were not solved well.	WHST.11-12.9
CT-LS.02.04.03.b. Analyze case studies where negotiation techniques are used.	WHST.11-12.9
Level 3	
CT-LS.02.04.01.c. Demonstrate critical and creative thinking skills while completing a task.	
CT-LS.02.04.02.c. Implement effective problem solving strategies.	
CT-LS.02.04.03.c. Demonstrate the skills needed to negotiate with others.	
CT-LS.02.05. Performance Indicator: Emotional Growth: Demonstrate healthy responses to one's feelings.	
Level 1	
CT-LS.02.05.01.a. Describe skills used to cope with different situations.	SL.9-10.4
CT-LS.02.05.02.a. Discover the characteristics of selfless and compassionate individuals.	
CT-LS.02.05.03.a. Describe the factors needed to build self-confidence.	SL.9-10.4
CT-LS.02.05.04.a. Analyze the benefits of emotional development.	WHST.9-10.7
CT-LS.02.05.05.a. Describe situations where seeking counsel would be appropriate (e.g., personal, legal, financial, etc.).	SL.9-10.4
Level 2	
CT-LS.02.05.01.b. Determine the coping process that best fits one's situation.	
CT-LS.02.05.02.b. Determine opportunities to demonstrate selflessness and compassion towards others.	
CT-LS.02.05.03.b. Analyze an individual's personal level of self-confidence.	WHST.11-12.7
CT-LS.02.05.04.b. Practice habits that positively affect emotional well-being.	
CT-LS.02.05.05.b. Analyze the positive outcomes of seeking counsel through an appropriate source.	WHST.11-12.7
Level 3	
CT-LS.02.05.01.c. Demonstrate one's ability to cope with life's trials.	
CT-LS.02.05.02.c. Practice the skills needed to live a compassionate and selfless life.	
CT-LS.02.05.03.c. Exhibit self-confidence while in the workplace.	
CT-LS.02.05.04.c. Develop emotional well-being in other team members.	
CT-LS.02.05.05.c. Seek appropriate counsel for specific situations (e.g., personal, legal, financial, etc.).	
CT-LS.02.06. Performance Indicator: Spiritual Growth: Reflect inner strength to allow one to define personal beliefs, values, principles and sense of balance.	
Level 1	
CT-LS.02.06.01.a. Define the terms: value, beliefs, and belief system.	RST.9-10.4

Leadership Skills Standards 9-12	Connecticut State Standards English Language Arts
CT-LS.02.06.02.a. Describe respectful, sensitive behaviors that can influence others.	SL.9-10.4
Level 2	
CT-LS.02.06.01.b. Create a personal belief statement.	WHST.11-12.4
CT-LS.02.06.02.b. Explain how respectful, sensitive behaviors lead to increased influence.	SL.11-12.4
Level 3	
CT-LS.02.06.01.c. Develop and nurture a personal belief system.	
CT-LS.02.06.02.c. Demonstrate respect and sensitivity to others' beliefs.	
CT-LS.03.01. Performance Indicator: Communication: Demonstrate oral, written and verbal skills.	
Level 1	
CT-LS.03.01.01.a. Use basic technical and business writing skills.	
CT-LS.03.01.02.a. Describe the various types and uses of resumes.	SL.9-10.4
CT-LS.03.01.03.a. Develop an outline or plan for a business presentation.	WHST.9-10.4
Level 2	
CT-LS.03.01.01.b. Select the appropriate form of technical and business writing or communication for a specific situation.	WHST.11-12.6
CT-LS.03.01.02.b. Prepare a resume.	WHST.11-12.4
CT-LS.03.01.03.b. Deliver a business presentation for a peer group (e.g., class presentation).	SL.11-12.4
Level 3	
CT-LS.03.01.01.c. Demonstrate technical and business writing skills to communicate effectively with co-workers and supervisors.	
CT-LS.03.01.02.c. Demonstrate effective use of a resume as part of an effort to obtain a job.	
CT-LS.03.01.03.c. Make effective business presentations.	
CT-LS.03.02. Performance Indicator: Decision Making – Analyze situations and execute an appropriate course of action.	
Level 1	
CT-LS.03.02.01.a. Analyze the steps in the decision-making process.	
CT-LS.03.02.02.a. Select resources to help in the problem-solving process.	WHST.9-10.8
CT-LS.03.02.03.a. Differentiate between ethical and unethical behavior.	
CT-LS.03.02.04.a. Use an interest inventory to determine goals appropriate to personal passions, abilities and aptitudes.	WHST.9-10.6
Level 2	
CT-LS.03.02.01.b. Utilize the process used to reach a conclusion for a decision.	
CT-LS.03.02.02.b. Determine information that is critical to solving problems.	WHST.9-10.9
CT-LS.03.02.03.b. Practice ethical behaviors.	
CT-LS.03.02.04.b. Assess personal skills to set goals for success in a career.	
Level 3	
CT-LS.03.02.01.c. Make decisions for a given situation by applying the decision-making process.	
CT-LS.03.02.02.c. Use problem-solving skills.	
CT-LS.03.02.03.c. Examine an ethical dilemma and prepare an argument for a position.	
CT-LS.03.02.04.c. Implement appropriate preparation plans for a career path	

Leadership Skills Standards 9-12	Connecticut State Standards English Language Arts
based on passion, abilities, aptitude, opportunities.	
CT-LS.03.03. Career Exploration and Development: Understand the diversity of careers related to the agricultural industry and strategies to acquire and advance in an agricultural career.	
Level 1	
CT-LS.03.03.01.a. Identify and demonstrate appropriate conduct at FFA meetings (F29; F34 Aquaculture).*	
CT-LS.03.01.02.a. Explain effective communication skills (F31; F36 Aquaculture).*	SL.9-10.4
Level 2	
CT-LS.03.03.01.b. Explain effective implementation of parliamentary procedure (F30; F35 Aquaculture).*	SL.9-10.4
CT-LS.03.01.02.b. Describe the qualities and characteristics of an effective leader (F32; F37 Aquaculture).*	SL.9-10.4
Level 3	
CT-LS.03.01.02.c. Identify and apply the various roles and responsibilities of a leader within an organization (F33; F38 Aquaculture).*	

Animal Science CT-AS.01.01 Performance Standard: Evaluate the development and implications of animal origin, domestication and distribution. Use the rational decision-making process as it applies to the roles of citizens, workers, and consumers.

CT Animal Science Standards 9-12	Connecticut State Standards English Language Arts
CT-AS.01.01. Performance Indicator: Evaluate the development and implications of animal origin, domestication and distribution.	
Level 1	
CT-AS.01.01.01.a. Identify the origin, significance, distribution and domestication of animal species.	RH.9-10.3; RST.9-10.9
CT-AS.01.01.02.a. Identify the products, services and careers within the companion, production and/or lab animal industry (A6).*	WHST.9-10.9; L.9-10.2; SL.9-10.4; SL.9-10.5
Level 2	
CT-AS.01.01.01.b. Evaluate and describe characteristics of animals that developed in response to the animals' environment and led to their domestication.	WHST.11-12.4; RST.11-12.1; RST.11-12.2
CT-AS.01.01.02.b. Outline the development of the animal industry and the resulting products, services and careers.	WHST.11-12.9
Level 3	
CT-AS.01.01.01.c. Predict adaptations of animals to production practices and environments.	
CT-AS.01.01.02.c. Predict trends and implications of future development of the animal systems industry.	
CT-AS.02.01. Performance Indicator: Classify animals according to hierarchical taxonomy and agricultural use.	
Level 1	
CT-AS.02.01.01.a. Explain the importance of the binomial system of nomenclature.	RST.9-10.1; RST.9-10.2; L.9-10.4; SL.9-10.4
CT-AS.02.01.02.a. Explain how companion, production and/or lab animals are scientifically classified (A4).*	RST.9-10.1; RST.9-10.2; SL.9-10.5
CT-AS.02.01.03.a. Identify breeds and types of companion, production and/or lab animals (A1).*	RH.9-10.1; SC.9-10.5;
Level 2	
CT-AS.02.01.01.b. Explain how animals are classified using Linnaeus's taxonomical classification system.	WHST.11-12.9; RST.11-12.3; RH.11-12.2
CT-AS.02.01.02.b. Compare and contrast the hierarchical classification of the major agricultural animal species.	RST.11-12.3
Level 3	
CT-AS.01.01.01.c. Predict adaptations of animals to production practices and environments.	
CT-AS.01.01.02.c. Predict trends and implications of future development of the animal systems industry.	
CT-AS.02.02. Performance Indicator: Apply principles of comparative anatomy and physiology to uses within various animal systems.	
Level 1	
CT-AS.02.02.01.a. Identify basic characteristics of animal cells, tissues,	RST.9-10.1

CT Animal Science Standards 9-12	Connecticut State Standards English Language Arts
organs and body systems.	
CT-AS.02.02.02.a. Diagram a typical animal cell and identify the organelles.	
CT-AS.02.02.03.a. Describe the basic functions of animal cells in growth and reproduction.	
CT-AS.02.02.04.a. Describe the properties, locations, functions and types of animal tissues.	WHST.9-10.7
CT-AS.02.02.05.a. Describe the properties, locations, functions and types of animal organs.	WHST.9-10.1
CT-AS.02.02.06.a. Describe the functions of the animal body systems and system components.	WHST.9-10.4; WHST.9-10.7; RST.9-10.1
CT-AS.02.02.07a. Demonstrate knowledge of the principles of comparative anatomy and physiology to uses within companion, production and/or lab animal systems (A11).*	L.9-10.2;
Level 2	
CT-AS.02.02.01.b. Compare and contrast animal cells, tissues, organs and body systems.	WHST.11-12.1; RH.11-12.9
CT-AS.02.02.02.b. Describe the functions of animal cell structures.	RST.11-12.1
CT-AS.02.02.03.b. Detail the processes of meiosis and mitosis in animal growth, development, health and reproduction.	RST.11-12.3
CT-AS.02.02.04.b. Explain the relationship of animal tissues to growth, performance and health.	WHST.11-12.1c; RST.11-12.1
CT-AS.02.02.05.b. Compare and contrast organ types and functions among animal species.	WHST.11-12.2a; RST.11-12.1
CT-AS.02.02.06.b. Compare and contrast body systems and system adaptations between animal species.	RST.11-12.1
Level 3	
CT-AS.02.02.01.c. Explain how the components and systems of animal anatomy and physiology relate to the production and use of animals.	
CT-AS.02.02.02.c. Describe the molecular makeup of animal cells and its importance in animal production and management.	
CT-AS.02.02.03.c. Explain the application of the processes of meiosis and mitosis to animal growth, development, health and reproduction.	
CT-AS.02.02.04.c. Explain the importance and uses made of animal tissues in the agriculture industry.	
CT-AS.02.02.05.c. Relate the importance of animal organs to the health, growth and reproduction of animals.	
CT-AS.02.02.06.c. Explain the impact of animal body systems on performance, health, growth and reproduction.	
CT-AS.02.03. Performance Indicator: Select animals for specific purposes and maximum performance based on anatomy and physiology.	
Level 1	
CT-AS.02.03.01.a. Identify ways an animal's health can be affected by anatomical and physiological disorders.	SL.9-10.5; SL9-10.6; RST.9-10.3; WHST.9-10.7
CT-AS.02.03.02.a. Create a program to develop an animal to its highest potential performance.	WHST.9-10.7; WHST.9-10.8; RST.9-10.3; L.9-10.2; L.9-10.6
Level 2	
CT-AS.02.03.01.b. Compare and contrast desirable anatomical and physiological characteristics of animals within and between species.	WHST.11-12.4; RST.11-12.1
CT-AS.02.03.02.b. Assess an animal to determine if it has reached its	RST.11-12.2

CT Animal Science Standards 9-12	Connecticut State Standards English Language Arts
optimal performance level based on anatomical and physiological characteristics.	
Level 3	
CT-AS.02.03.01.c. Evaluate and select animals to maximize performance based on anatomical and physiological characteristics that affect health, growth and reproduction.	
CT-AS.02.03.02.c. Develop efficient procedures to produce consistently high-quality animals well suited for their intended purposes.	
CT-AS.03.01. Performance Indicator: Prescribe and implement a prevention and treatment program for animal diseases, parasites and other disorders.	
Level 1	
CT-AS.03.01.01.a. Maintain animal health and sanitation for companion, production and/or lab animals (A2).*	WHST.9-10.4; RST.9-10.3
CT-AS.03.01.02.a. Understand the procedures to maintain health and production records for companion, production and/or lab animals (A8).*	SL.9-10.5; SL.9-10.6; RST.9-10.9
CT-AS.03.01.03.a. Recognize diseases and ailments of companion, production and/or lab animals (A3).*	SL.9-10.5; SL.9-10.6; RST.9-10.1
CT-AS.03.01.04.a. Explain characteristics of causative agents and vectors of diseases and disorders in animals.	SL.9-10.5; SL.9-10.6; L.9-10.2; L.9-10.6; RST.9-10.1
CT-AS.03.01.05.a. Explain the clinical significance of common considerations in veterinary treatments, such as aseptic techniques.	WHST.9-10.1a; SL.9-10.5; SL.9-10.6; L.9-10.2; L.9-10.6; RST.9-10.3
CT-AS.03.01.06.a. Identify and describe zoonotic diseases.	WHST.9-10.4; SL.9-10.5; SL.9-10.6; RST.9-10.1
Level 2	
CT-AS.03.01.01.b. Follow industry protocols for animal health.	SL.11-12.4; SL.11-12.6; RST.11-12.3
CT-AS.03.01.02.b. Perform simple health-check evaluations on animals.	RST.11-12.3
CT-AS.03.01.03.b. Diagnose illnesses and disorders of animals based on symptoms and problems caused by diseases, parasites and physiological disorders.	SL.11-12.5; RST.11-12.1
CT-AS.03.01.04.b. Evaluate preventive measures for controlling and limiting the spread of diseases, parasites and disorders among animals.	WHST.11-12.6; WHST.11-12.7; WHST.11-12.8; WHST.11-12.9; SL.11-12.5; RH.11-12.3
CT-AS.03.01.05.b. Prepare animals, facilities and equipment for surgical and nonsurgical veterinary treatments and procedures.	SL.11-12.5; RST.11-12.3
CT-AS.03.01.06.b. Explain the health risk of zoonotic diseases to humans and their historical significance and future implications.	WHST.11-12.2; SL.11-12.5; L.9-10.2; L.9-10.6; RH.11-12.1
Level 3	
CT-AS.03.01.01.c. Evaluate animals for health and sanitation.	
CT-AS.03.01.02.c. Perform diagnostic tests to detect health problems in animals.	
CT-AS.03.01.03.c. Treat common diseases, parasites and physiological disorders of animals.	
CT-AS.03.01.04.c. Design and implement a health maintenance and disease and disorder prevention plan for animals in their natural and/or confined environments.	

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CT-AS.03.01.05.c. Perform surgical and nonsurgical veterinary treatments and procedures in animal health care.	
CT-AS.03.01.06.c. Implement zoonotic disease prevention methods and procedures for the safe handling and treatment of animals.	
CT-AS.03.02. Performance Indicator: Provide for the biosecurity of agricultural animals and production facilities.	
Level 1	
CT-AS.03.02.01.a. Explain the importance of biosecurity to the animal industry.	WHST.9-10.4; SL.9-10.5; SL.9-10.6; RH.9-10.9
Level 2	
CT-AS.03.02.01.b. Discuss procedures at the local, state and national levels to ensure biosecurity of the animal industry.	WHST.11-12.6; SL.9-10.6; L.9-10.2; L.9-10.6; RH.11-12.1
Level 3	
CT-AS.03.02.01.c. Implement a biosecurity plan for an animal production operation.	
CT-AS.04.01. Performance Indicator: Formulate feed rations to provide for the nutritional needs of animals.	
Level 1	
CT-AS.04.01.01.a. Compare and contrast common types of feedstuffs and the roles they play in the diets of animals.	WHST.9-10.4; L.9-10.2; L.9-10.6; RH.9-10.9
CT-AS.04.01.02.a. Explain the importance of a balanced ration for animals.	WHST.9-10.4; RST.9-10.3
Level 2	
CT-AS.04.01.01.b. Calculate costs and analyses of feed for companion, production and/or lab animals (A5).*	RST.11-12.8
CT-AS.04.01.02.b. Appraise the adequacy of feed rations using data from the analysis of feedstuffs, animal requirements and performance.	WHST.11-12.9; WHST.11-12.2a; RST.11-12.9; RST.11-12.8
Level 3	
CT-AS.04.01.01.c. Select appropriate feedstuffs for animals based on factors such as economics, digestive system and nutritional needs.	
CT-AS.04.01.02.c. Formulate animal feeds based on nutritional requirements, using feed ingredients for maximum nutrition and optimal economic production.	
CT-AS.04.02. Performance Indicator: Formulate and administer animal supplements, animal feed additives and growth promoters in animal production.	
Level 1	
CT-AS.04.02.01.a. Explain the purpose and benefits of feed additives and growth promoters in animal production.	WHST.9-10.1a,b; RST.9-10.9; SL.9-10.5; L.9-10.2; L.9-10.6
Level 2	
CT-AS.04.02.01.b. Discuss how feed additives and growth promoters are administered and the precautions that should be taken.	L.9-10.2; L.9-10.6; RST.9-10.8
Level 3	
CT-AS.04.02.01.c. Prescribe and administer feed additives and growth promoters.	
CT-AS.05.01. Performance Indicator: Evaluate the male and female reproductive systems in selecting animals.	
Level 1	

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CT-AS.05.01.01.a. Explain the male and female reproductive organs of the major animal species.	WHST.9-10.4
Level 2	
CT-AS.05.01.01.b. Describe the functions of major organs in the male and female reproductive systems.	WHST.11-12.7; RH.11-12.9
Level 3	
CT-AS.05.01.01.c. Select breeding animals based on characteristics of the reproductive organs.	
CT-AS.05.02. Performance Indicator: Evaluate animals for breeding readiness and soundness.	
Level 1	
CT-AS.05.02.01.a. Explain how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female animals.	WHST.9-10.4; WHST.9-10.9; RST.9-10.1
CT-AS.05.02.02.a. Discuss the importance of efficient and economic reproduction in animals.	WHST.9-10.4; WHST.9-10.9; L.9-10.2; L.9-10.6; RST.9-10.9
Level 2	
CT-AS.05.02.01.b. Summarize factors that lead to reproductive maturity.	RST.11-12.9
CT-AS.05.02.02.b. Evaluate reproductive problems that occur in animals.	WHST.11-12.7; WHST.11-12.8; WHST.11-12.9; RST.11-12.8
Level 3	
CT-AS.05.02.01.c. Evaluate and select animals for reproductive readiness.	
CT-AS.05.02.02.c. Treat or cull animals with reproductive problems.	
CT-AS.05.03. Performance Indicator: Apply scientific principles in the selection and breeding of animals.	
Level 1	
CT-AS.05.03.01.a. Explain genetic inheritance in agricultural animals.	RST.9-10.1; WHST.9-10.7; SL.9-10.5
CT-AS.05.03.02.a. Define natural and artificial breeding methods.	RST.9-10.2; WHST.9-10.4; SL.9-10.5
CT-AS.05.03.03.a. Explain the use of quantitative breeding values (e.g., EPDs) in the selection of genetically superior breeding stock.	WHST.9-10.4; SL.9-10.5; RST.9-10.1
CT-AS.05.03.04.a. Explain the advantages of major reproductive management practices, including estrous synchronization, super ovulation, flushing and embryo transfer.	RST.9-10.9
CT-AS.05.03.05.a. Discuss the uses and advantages and disadvantages of natural breeding and artificial insemination.	WHST.9-10.4; L.9-10.2; L.9-10.6; RST.9-10.9
CT-AS.05.03.06.a. Discuss the principles of companion, production and/or lab animal reproduction, genetics and the application of new and emerging technologies in animal reproduction (A9).*	WHST.9-10.7; WHST.9-10.8, WHST.9-10.9; SL.9-10.5; SL.9-10.6; L.9-10.2; L.9-10.6; RST.9-10.9
Level 2	
CT-AS.05.03.01.b. Explain the advantages of using genetically superior animals in the production of animals and animal products.	WHST.11-12.9; SL.11-12.4; SL.11-12.5; SL.11-12.6; RST.11-12.9
CT-AS.05.03.02.b. Explain the processes of natural and artificial	WHST.11-12.9; RST.11-12.9

CT Animal Science Standards 9-12	Connecticut State Standards English Language Arts
breeding methods.	
CT-AS.05.03.03.b. Compare and contrast quantitative breeding value differences between genetically superior animals and animals of average genetic value.	L.9-10.2; L.9-10.6; SL.11-12.4; SL.11-12.5; SL.11-12.6; WHST.11-12.7; WHST.11-12.8; WHST.11-12.9; RST.11-12.3
CT-AS.05.03.04.b. Explain the processes of major reproductive management practices, including estrous synchronization, super ovulation, flushing and embryo transfer.	WHST.11-12.4; SL.11-12.4; SL.11-12.5; SL.11-12.6; RST.11-12.9
CT-AS.05.03.05.b. Explain the materials, methods and processes of artificial insemination.	WHST.11-12.4; SL.11-12.5; RST.11-12.9
Level 3	
CT-AS.05.03.01.c. Select a breeding system based on the principles of genetics.	
CT-AS.05.03.02.c. Select animal breeding methods based on reproductive and economic efficiency.	
CT-AS.05.03.03.c. Select animals based on quantitative breeding values for specific characteristics.	
CT-AS.05.03.04.c. Perform procedures for estrous synchronization, superovulation, flushing, embryo transfer and other reproductive management practices.	
CT-AS.05.03.05.c. Demonstrate artificial insemination techniques.	
CT-AS.06.01. Performance Indicator: Demonstrate safe animal handling and management techniques.	
Level 1	
CT-AS.06.01.01.a. Discuss the dangers involved in working with animals.	LS.9-10.5
CT-AS.06.01.02.a. Explain the implications of animal welfare and animal rights for animal agriculture (A10).*	WHST.9-10.7; WHST.9-10.8; L.9-10.2; L.9-10.6; LS.9-10.1a-d; LS.9-10.2, LS.9-10.3; RST.9-10.9
Level 2	
CT-AS.06.01.01.b. Outline safety procedures for working with animals by species.	SL.11-12.5; L.9-10.2; L.9-10.6; RH.11-12.9
CT-AS.06.01.02.b. Design programs that assure the welfare of animals and prevent abuse or mistreatment.	WHST.11-12.4; WHST.11-12.6; WHST.11-12.7; WHST.11-12.8; L.11-12.2; L.11-12.6; SL.11-12.5; RH.11-12.7
Level 3	
CT-AS.06.01.01.c. Interpret animal behaviors and execute protocols for safe handling of animals.	
CT-AS.06.01.02.c. Implement quality-assurance programs and procedures for animal production.	
CT-AS.06.02. Performance Indicator: Implement procedures to ensure that animal products are safe.	
Level 1	
CT-AS.06.02.01.a. Identify animal production practices that could pose health risks or are considered to pose risks by some.	LS.9-10.5; RST.9-10.1
CT-AS.06.02.02.a. Describe how animal identification systems can track	WHST.9-10.2a,b; WHST.9-

CT Animal Science Standards 9-12	Connecticut State Standards English Language Arts
an animal's location, nutrition requirements, production progress and changes in health.	10.7; WHST.9-10.8; RST.9-10.9; LS.9-10.5; L.9-10.2; L.9-10.6
Level 2	
CT-AS.06.02.01.b. Discuss consumer concerns with animal production practices relative to human health.	WHST.11-12.4; WHST.11-12.7; WHST.11-12.8; LS. 11-12.4; LS.11-12.5; L.11-12.2; L11-12.6; RST.11-12.2
CT-AS.06.02.02.b. Explain why animal trace-back capability, using individual animal and farm identification systems, is important to producers and consumers.	WHST.11-12.4; WHST.11-12.7; WHST.11-12.8; LS.11-12.4; LS.11-12.5; L.11-12.2; L11-12.6; RST.11-12.9
Level 3	
CT-AS.06.02.01.c. Implement a program to assure the safety of animal products.	
CT-AS.06.02.02.c. Implement an animal and/or premises identification program.	
CT-AS.07.01. Performance Indicator: Design animal housing, equipment and handling facilities for the major systems of animal production.	
Level 1	
CT-AS.07.01.01.a. Identify optimal living conditions for companion, production and/or lab animals (A12).*	LS.9-10.5; RST.9-10.9
CT-AS.07.01.02.a. Identify equipment and handling facilities used in modern animal production.	LS.9-10.5
Level 2	
CT-AS.07.01.01.b. Critique designs for an animal facility and prescribe alternative layouts and adjustments for the safe and efficient use of the facility.	RST.11-12.9
CT-AS.07.01.02.b. Describe safe handling, shipment and bio-security of companion, production and/or lab animals (A7).*	WHST.11-12.4; L.11-12.2; L.11-12.6; RST.11-12.9
Level 3	
CT-AS.07.01.01.c. Design an animal facility, focusing on animal requirements, efficiency, safety and ease of handling.	
CT-AS.07.01.02.c. Select equipment and implement animal handling procedures and improvements to enhance production efficiency.	
CT-AS.07.02. Performance Indicator: Comply with government regulations and safety standards for facilities used in animal production.	
Level 1	
CT-AS.07.02.01.a. List the general standards (e.g., environmental, zoning, construction) that must be met in facilities for animal production.	WHST.9-10.4; LS.9-10.5; RST.9-10.1
Level 2	
CT-AS.07.02.01.b. Evaluate an animal facility to determine if standards have been met.	RST.11-12.5
Level 3	
CT-AS.07.02.01.c. Design a facility that meets standards for the legal, safe, ethical and efficient production of animals.	
CT-AS.08.01. Performance Indicator: Reduce the effects of animal production on the environment.	
Level 1	

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CT-AS.08.01.01.a. Evaluate the effects of animal agriculture on the environment.	RST.9-10.1; L.9-10.2; L.9-10.6; WHST.9-10.6; WHST.9-10.7; WHST.9-10.8; LS.9-10.4; LS.9-10.5; LS.9-10.6
Level 2	
CT-AS.08.01.01.b. Outline methods of reducing the effects of animal agriculture on the environment.	LS.11-12.4; LS.11-12.5; LS.11-12.6; L.11-12.2; L.11-12.6; RST.9-10.2
Level 3	
CT-AS.08.01.01.c. Implement measures to reduce the impact of animal agriculture on the environment.	
CT-AS.08.02. Performance Indicator: Evaluate the effects of environmental conditions on animals.	
Level 1	
CT-AS.08.02.01.a. Identify optimal environmental conditions for animals.	LS.9-10.5; RST.9-10.3
Level 2	
CT-AS.08.02.01.b. Describe the effects of environmental conditions on animal populations and performance.	WHST.11-12.4; LS.11-12.4; LS.11-12.5; LS.11-12.6; L.11-12.2; L.11-12.6; RST.11-12.1
Level 3	
CT-AS.08.02.01.c. Establish and maintain favorable environmental conditions for animal growth and performance.	
CT-AS.09.01. Performance Indicator: Evaluate the significance and implications of changes and trends in the food product and processing industry.	
Level 1	
CT-AS.09.01.01.a Discuss the history and describe and explain the components (e.g., processing, distribution, byproducts) of the food products and processing industry.	WHST.9-10.2a,b; LS.9-10.5; RH.9-10.1
CT-AS.09.01.02.a Identify and explain environmental and safety concerns about the food supply.	WHST.9-10.7; LS.9-10.2; L.9-10.2; RST.9-10.1
Level 2	
CT-AS.09.01.01.b Evaluate changes and trends in the food products and processing industry.	WHST.11-12.9; LS.11-12.5; L.11-12.2; RST.11-12.8
CT-AS.09.01.02.b Discuss the issues of safety and environmental concerns about foods and food processing (e.g., Genetically Modified Organisms, microorganisms, contamination, irradiation).	LS.11-12.1a-d; LS.11-12.2; LS.11-12.3; RH.11-12.1
Level 3	
CT-AS.09.01.01.c Predict trends and implications in the food products and processing industry.	
CT-AS.09.01.02.c Determine appropriate industry response to consumer concerns to assure a safe and wholesome food supply.	
CT-AS.10.01. Performance Indicator: Performance Indicator: Implement Hazard Analysis and Critical Control Point (HACCP) procedures to establish operating parameters	
Level 1	
CT-AS.10.01.01.a Describe contamination hazards (physical, chemical and biological) associated with food products and processing.	WHST.9-10.4; L.9-10.6; LS.9-10.5; RST.9-10.1

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CT-AS.10.01.02.a Identify the seven principles of HACCP.	LS.9-10.4; RST.9-10.1
Level 2	
CT-AS.10.01.01.b Outline procedures to eliminate possible contamination hazards associated with food products and processing.	WHST.11-12.4; L.11-12.2; L.11-12.6; LS.11-12.5; RST.11-12.2; RST.11-12.1
CT-AS.10.01.02.b Explain the implementation of the seven principles of HACCP.	LS.11-12.5; L.11-12.2; L.11-12.6; RST.11-12.2
Level 3	
CT-AS.10.01.01.c Analyze the effectiveness of a food products and processing company's Critical Control Point (CCP) procedures.	
CT-AS.10.01.02.c Implement an HACCP program for a food products and processing facility.	
CT-AS.10.02. Performance Indicator: Apply safety and sanitation procedures in the handling, processing and storing of food products	
Level 1	
CT-AS.10.02.01.a Explain techniques and procedures for the safe handling of food products.	LS.9-10.5; RST.9-10.9
CT-AS.10.02.02.a Describe the importance of performing quality-assurance tests on food products.	WHST.9-10.9; L.9-10.2; RH.9-10.9
CT-AS.10.02.03.a Describe the effects food-borne pathogens have on food products and humans.	LS.9-10.5; L.9-10.2
Level 2	
CT-AS.10.02.01.b Evaluate food product handling procedures.	LS.11-12.5; RST.11-12.8
CT-AS.10.02.02.b Perform quality-assurance tests on food products.	LS.11-12.5; RST.11-12.3
CT-AS.10.02.03.b Explain the importance of microbiological tests in food product preparation, listing common spoilage and pathogenic microorganisms.	WHST.11-12.7; WHST.11-12.8; L.11-12.2; L.11-12.6; LS.11-12.5; LS.11-12.6; RST.11-12.9
Level 3	
CT-AS.10.02.01.c Demonstrate approved food product handling techniques.	
CT-AS.10.02.02.c Interpret quality-assurance test results and apply corrective procedures.	
CT-AS.10.02.03.c Conduct and interpret microbiological tests for food-borne pathogens and implement corrective procedures.	
CT-AS.11.01. Performance Indicator: Utilize harvesting, selection and inspection techniques to obtain quality food products for processing	
Level 1	
CT-AS.11.01.01.a Identify quality and yield grades of food products.	LS.9-10.5; RST.9-10.1
CT-AS.11.01.02.a Select raw food products based on yield grades, quality grades and related selection criteria.	RST.9-10.3
CT-AS.11.01.03.a Identify and describe accepted animal treatment and harvesting techniques.	LS.9-10.4; LS.9-10.5; RST.9-10.9
CT-AS.11.01.04.a Describe the importance of premortem and post-mortem inspections of animals for harvest.	WHST.9-10.9; L.9-10.2; L.9-10.6; RST.9-10.1
Level 2	
CT-AS.11.01.01.b Discuss factors that affect quality and yield grades of food products.	LS.11-12.5; RST.11-12.1

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CT-AS.11.01.02.b Perform quality-control inspections of raw food products for processing.	LS.11-12.5; RST.11-12.3
CT-AS.11.01.03.b Compare and contrast accepted animal treatment and harvesting techniques.	LS.11-12.4; LS.11-12.5; L.11-12.2; L.11-12.6; RST.11-12.9
CT-AS.11.01.04.b Explain desirable and undesirable characteristics of both premortem and post-mortem animals in relation to the production of food products.	LS.11-12.5; L.11-12.2; L.11-12.6; RST.11-12.9
Level 3	
CT-AS.11.01.01.c Assign quality and yield grades to food products according to industry standards.	
CT-AS.11.01.02.c Implement procedures to maintain original food quality and yield.	
CT-AS.11.01.03.c Harvest animals using regulatory agency-approved or industry approved techniques.	
CT-AS.11.01.04.c Conduct pre-mortem and postmortem inspections of animals.	

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Aquaculture

CT Aquaculture Standards 9-12	Common Core State Standards English Language Arts
CT-AQ.01.01. Performance Indicator: Evaluate the development and implications of aquatic species origin, domestication and distribution.	
Level 1	
CT-AQ.01.01.01.a. Identify the origin, significance, distribution and commercial importance of aquatic species.	RST.9-10.3
CT-AQ.01.01.02 Identify invasive species impacting aquaculture production (A9).*	RST.9-10.3
CT-AQ.01.01.03 Identify and describe aquaculture intensive and extensive enhancement strategies (A3).*	RST.9-10.3;SL.9-10.4
Level 2	
CT-AQ.01.01.b. Evaluate and describe characteristics of aquatic animals that developed in response to the aquatic species' environment and led to their commercial use.	SL.11-12.4;WHST.11-12.9
Level 3	
CT-AQ.01.01.01.c. Predict adaptations of aquatic species to production practices and environments.	
CT-AQ.02.01. Performance Indicator: Classify animals according to hierarchical taxonomy and agricultural use.	
Level 1	
CT-AQ.02.01.01.a. Explain the importance of the binomial system of nomenclature.	SL.9-10.4
CT-AQ.02.01.02.a. Identify major aquatic species by common and scientific names.	RST.9-10.3
CT-AQ.02.01.03.a. Classify fresh water and marine species produced for commercial and recreational purposes (A2).*	RST.9-10.3
Level 2	
CT-AQ.02.01.01.b. Explain how aquatic species are classified using Linnaeus's taxonomical classification system.	SL.11-12.4
CT-AQ.02.01.02.b. Compare and contrast the hierarchical classification of the major aquatic species.	
Level 3	
CT-AQ.02.01.01.c. Classify aquatic species according to the taxonomical classification system.	
CT-AQ.02.01.02.c. Appraise and evaluate the economic value of aquatic species for various applications in the aquaculture industry.	
CT-AQ.02.02. Performance Indicator: Apply principles of comparative anatomy and physiology to uses within various aquatic species.	
Level 1	
CT-AQ.02.02.01.a. Identify morphological features of finfish and shellfish (A10).*	
CT-AQ.02.02.02.a. Diagram a typical aquatic species cell and identify the organelles.	
CT-AQ.02.02.03.a. Describe the basic functions of aquatic species cells in growth and reproduction.	
CT-AQ.02.02.04.a. Describe the properties, locations, functions and types of aquatic species tissues.	
CT-AQ.02.02.05.a. Describe the properties, locations, functions and	

CT Aquaculture Standards 9-12	Common Core State Standards English Language Arts
types of aquatic species organs.	
CT-AQ.02.02.06.a. Describe the functions of the aquatic species body systems and system components.	SL.9-10.4
Level 2	
CT-AQ.02.02.01.b. Compare and contrast aquatic species cells, tissues, organs and body systems.	RST.11-12.3
CT-AQ.02.02.02.b. Describe the functions of aquatic species cell structures.	SL.11-12.4
CT-AQ.02.02.03.b. Detail the processes of meiosis and mitosis in aquatic species growth, development, health and reproduction.	WHST.11-12.9
CT-AQ.02.02.04.b. Explain the relationship of aquatic species tissues to growth, performance and health.	SL.11-12.4
CT-AQ.02.02.05.b. Compare and contrast organ types and functions among aquatic species.	RST.11-12.3
CT-AQ.02.02.06.b. Compare and contrast body systems and system adaptations between aquatic species.	RST.11-12.3
Level 3	
CT-AQ.02.02.01.c. Explain how the components and systems of aquatic species anatomy and physiology relate to the production and use of aquatic species.	
CT-AQ.02.02.02.c. Describe the molecular makeup of aquatic species cells and its importance in aquaculture production and management.	
CT-AQ.02.02.03.c. Explain the application of the processes of meiosis and mitosis to aquatic species growth, development, health and reproduction.	
CT-AQ.02.02.04.c. Explain the importance and uses made of aquatic species tissues in the aquaculture industry.	
CT-AQ.02.02.05.c. Relate the importance of aquatic species organs to the health, growth and reproduction of animals.	
AS.02.02.06.c. Explain the impact of aquatic species body systems on performance, health, growth and reproduction.	
CT-AQ.02.03. Performance Indicator: Select aquatic species for specific purposes and maximum performance based on anatomy and physiology.	
Level 1	
CT-AQ.02.03.01.a. Identify ways aquatic species' health can be affected by anatomical and physiological disorders.	RST.9-10.4
CT-AQ.02.03.02.a. Create a program to develop an aquatic species to its highest potential performance.	WHST.9-10.4
CT-AQ.02.03.03.a. Understand the lifecycle of aquatic animals (A11).*	WHST.9-10.9
Level 2	
CT-AQ.02.03.01.b. Compare and contrast desirable anatomical and physiological characteristics of aquatic plants and animals within and between species.	RST.11-12.3
CT-AQ.02.03.02.b. Assess an aquatic species to determine if it has reached its optimal performance level based on anatomical and physiological characteristics.	RST.11-12.3
Level 3	
CT-AQ.02.03.01.c. Evaluate and select aquatic species to maximize performance based on anatomical and physiological characteristics that affect health, growth and reproduction.	

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CT-AQ.02.03.02.c. Develop efficient procedures to produce consistently high-quality aquatic species well suited for their intended purposes.	
CT-AQ.03.01. Performance Indicator: Prescribe and implement a prevention and treatment program for aquatic species diseases, parasites and other disorders.	
Level 1	
CT-AQ.03.01.01.a. Explain methods of determining aquatic species health and disorders.	SL.9-10.4
CT-AQ.03.01.02.a. Identify common diseases, parasites and physiological disorders that affect aquatic species.	RST.9-10.3
CT-AQ.03.01.03.a. Explain characteristics of causative agents and vectors of diseases and disorders in aquatic species.	SL.9-10.4
CT-AQ.03.01.04.a. Explain the clinical significance of common considerations in veterinary treatments, such as aseptic techniques.	SL.9-10.4
CT-AQ.03.01.05.a. Identify and describe zoonotic diseases.	SL.9-10.4; RST.9-10.3
Level 2	
CT-AQ.03.01.b. Identify protocols needed to diagnose, treat and prevent basic aquatic diseases to maintain healthy populations (A7).*	RST.11-12.3
CT-AQ.03.01.02.b. Diagnose illnesses and disorders of aquatic species based on symptoms and problems caused by diseases, parasites and physiological disorders.	RST.11-12.3
CT-AQ.03.01.03.b. Evaluate the health and productivity of fish and shellfish populations (A5).*	RST.11-12.3
CT-AQ.03.01.04.b. Prepare aquatic species, facilities and equipment for surgical and nonsurgical veterinary treatments and procedures.	RST.11-12.3
CT-AQ.03.01.05.b. Explain the health risk of zoonotic diseases to humans and their historical significance and future implications.	SL.11-12.4
Level 3	
CT-AQ.03.01.01.c. Perform diagnostic tests to detect health problems in aquatic species.	
CT-AQ.03.01.02.c. Treat common diseases, parasites and physiological disorders of aquatic species.	
CT-AQ.03.01.03.c. Design and implement a health maintenance and disease and disorder prevention plan for aquatic species in their natural and/or confined environments.	
CT-AQ.03.01.04.c. Perform surgical and nonsurgical veterinary treatments and procedures in aquatic animal health care.	
CT-AQ.03.01.05.c. Implement zoonotic disease prevention methods and procedures for the safe handling and treatment of aquatic animals.	
CT-AQ.03.02. Performance Indicator: Provide for the biosecurity of aquatic species and production facilities.	
Level 1	
CT-AQ.03.02.01.a. Explain the importance of biosecurity to the aquaculture industry.	SL.9-10.4
Level 2	
CT-AQ.03.02.01.b. Discuss procedures at the local, state and national levels to ensure biosecurity of the aquaculture industry.	SL.11-12.4
Level 3	

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CT-AQ.03.02.01.c. Implement a biosecurity plan for an aquaculture production operation.	
CT-AQ.04.01. Performance Indicator: Formulate feed rations to provide for the nutritional needs of animals.	
Level 1	
CT-AQ.04.01.01.a. Compare and contrast common types of feedstuffs and the roles they play in the diets of aquatic animals.	RST.9-10.3
CT-AQ.04.01.02.a. Identify nutrients and nutritional strategies for finfish and shellfish production (A15).*	RST.9-10.3
Level 2	RST.9-10.3
CT-AQ.04.01.01.b. Determine the relative nutritional value of feedstuffs by evaluating their general quality and condition.	RST.11-12.3
CT-AQ.04.01.02.b. Appraise the adequacy of feed rations using data from the analysis of feedstuffs, aquatic animal requirements and performance.	RST.11-12.3
Level 3	
CT-AQ.11.01.01.c. Select appropriate feedstuffs for aquatic animals based on factors such as economics, digestive system and nutritional needs.	
CT-AQ.04.01.02.c. Formulate aquatic animal feeds based on nutritional requirements, using feed ingredients for maximum nutrition and optimal economic production.	
CT-AQ.05.01. Performance Indicator: Evaluate the male and female reproductive systems in selecting aquatic species.	
Level 1	
CT-AQ.05.01.01.a. Explain the male and female reproductive organs of the major aquatic animal species.	SL.9-10.4
Level 2	
CT-AQ.05.01.01.b. Describe the functions of major organs in the male and female reproductive systems.	SL.11-12.4
Level 3	
CT-AQ.05.01.01.c. Select breeding species based on characteristics of the reproductive organs	
CT-AQ.05.02. Performance Indicator: Evaluate aquatic animals for breeding readiness and soundness.	
Level 1	
CT-AQ.05.02.01.a. Explain how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female aquatic animals.	SL.9-10.4
CT-AQ.05.02.02.a. Discuss the importance of efficient and economic reproduction in aquatic animals.	SL.9-10.1
Level 2	
CT-AQ.05.02.01.b. Summarize factors that lead to reproductive maturity.	WHST.11-12.4
CT-AQ.05.02.02.b. Evaluate reproductive problems that occur in aquatic animals.	RST.11-12.3
Level 3	
CT-AQ.5.02.01.c. Evaluate and select aquatic animals for reproductive readiness.	

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CT-AQ.05.02.02.c. Treat or cull aquatic animals with reproductive problems.	
CT-AQ.05.03. Performance Indicator: Apply scientific principles in the selection and breeding of aquatic species.	
Level 1	
CT-AQ.05.03.01.a. Explain genetic inheritance in aquatic species.	SL.9-10.4
CT-AQ.05.03.02.a. Define natural and artificial breeding methods.	RST.9-10.4
CT-AQ.05.03.03.a. Explain the use of quantitative breeding values (e.g., EPDs) in the selection of genetically superior breeding stock.	SL.9-10.4
Level 2	
CT-AQ.05.03.01.b. Explain the advantages of using genetically superior species in the production of aquatic plants and animals and aqua cultural products.	SL.11-12.4
CT-AQ.05.03.02.b. Explain the processes of natural and artificial breeding methods.	SL.11-12.4
CT-AQ.05.03.03.b. Compare and contrast quantitative breeding value differences between genetically superior aquatic species and aquatic species of average genetic value.	
Level 3	
CT-AQ.05.03.01.c. Select a breeding system based on the principles of genetics.	
CT-AQ.05.03.02.c. Select aquatic species breeding methods based on reproductive and economic efficiency.	
CT-AQ.05.03.03.c. Select aquatic species based on quantitative breeding values for specific characteristics.	
CT-AQ.06.01. Performance Indicator: Demonstrate safe aquatic animal handling and management techniques.	
Level 1	
CT-AQ.06.01.01.a. Discuss the dangers involved in working with aquatic animals.	SL.9-10.4
CT-AQ.06.01.02.a. Explain the implications of animal welfare and animal rights for aquaculture.	SL.9-10.4
Level 2	
CT-AQ.06.01.01.b. Outline safety procedures for working with aquatic animals by species.	WHST.11-12.4
CT-AQ.06.01.02.b. Design programs that assure the welfare of aquatic animals and prevent abuse or mistreatment.	WHST.11-12.4
Level 3	
CT-AQ.13.01.01.c. Interpret animal behaviors and execute protocols for safe handling of aquatic animals.	
CT-AQ.06.01.02.c. Implement quality-assurance programs and procedures for aquatic animal production.	
CT-AQ.06.02. Performance Indicator: Implement procedures to ensure that aquaculture products are safe.	
Level 1	
CT-AQ.06.02.01.a Identify aquatic animal production practices that could pose health risks or are considered to pose risks by some.	RST.9-10.3
CT-AQ.06.02.02.a. Describe how aquatic animal identification systems	SL.9-10.4

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can track an animal's location, nutrition requirements, production progress and changes in health.	
Level 2	
CT-AQ.06.02.01.b. Discuss consumer concerns with aquatic animal production practices relative to human health.	SL.11-12.1
CT-AQ.06.02.02.b. Explain why aquatic animal trace-back capability, using individual aquatic animal and aquaculture facility identification systems, is important to producers and consumers.	SL.11-12.4
Level 3	
CT-AQ.06.02.01.c. Implement a program to assure the safety of animal products.	
CT-AQ.06.02.02.c. Implement an aquatic animal and/or premises identification program.	
CT-AQ.07.01. Performance Indicator: Design aquatic species housing, equipment and handling facilities for the major systems of aquaculture production.	
Level 1	
CT-AQ.07.01.01.a. Demonstrate knowledge of the design and management of aquaculture systems (A1).*	
CT-AQ.07.01.02.a. Identify equipment and handling facilities used in modern aquaculture production.	RST.9-10.3
CT-AQ.07.01.03.a. Identify the operating components and principles of filtration and aeration (A12).*	RST.9-10.3
Level 2	
CT-AQ.07.01.01.b. Critique designs for an aquaculture facility and prescribe alternative layouts and adjustments for the safe and efficient use of the facility.	WHST.11-12.9
CT-AQ.07.01.02.b. Explain how modern equipment and handling facilities enhance the safe and economic production of aquatic species.	SL.11-12.4
CT-AQ.07.01.03.b. Explain the basic electrical, plumbing and mechanical components of aquaponic systems (A13).*	SL.11-12.4
Level 3	
CT-AQ.07.01.01.c. Design an aquatic facility, focusing on aquatic species requirements, efficiency, safety and ease of handling.	
CT-AQ.07.01.02.c. Select equipment and implement handling procedures and improvements to enhance production efficiency of aquatic species.	
CT-AQ.07.02. Performance Indicator: Comply with government regulations and safety standards for facilities used in aquaculture production.	
Level 1	
CT-AQ.07.02.01.a. List the general standards (e.g., environmental, zoning, construction) that must be met in facilities for aquaculture production.	WHST.9-10.4
CT-AQ.07.02.02.a. Interpret laws related to aquaculture management and production (A16).*	WHST.9-10.9
Level 2	
CT-AQ.07.02.01.b. Evaluate an aquaculture facility to determine if standards have been met.	WHST.11-12.7

CT Aquaculture Standards 9-12	Common Core State Standards English Language Arts
Level 3	
CT-AQ.07.02.01.c. Design a facility that meets standards for the legal, safe, ethical and efficient production of aquatic species.	
CT-AQ.08.01. Performance Indicator: Reduce the effects of aquaculture on the environment.	
Level 1	
CT-AQ.08.01.01.a. Evaluate the effects of aquaculture on the environment.	WHST.9-10.7
Level 2	
CT-AQ.08.01.01.b. Outline methods of reducing the effects of aquaculture on the environment.	WHST.9-10.7
Level 3	
CT-AQ.08.01.01.c. Apply sustainable principles and practices to aquaculture production and management (A4).*	
CT-AQ.08.02. Performance Indicator: Evaluate the effects of environmental conditions on aquatic species.	
Level 1	
CT-AQ.15.02.01.a. Identify optimal environmental conditions for aquatic species.	RST.9-10.3
CT-AQ.15.02.01.a. Apply environmental and ecological concepts to aquaculture production (A6).*	RST.9-10.3
Level 2	
CT-AQ.15.02.01.b. Describe the effects of environmental conditions on aquatic species populations and performance.	SL.11-12.4
Level 3	
CT-AQ.08.02.01.c. Establish and maintain favorable environmental conditions for aquatic species growth and performance.	
CT-AQ.09.01. Performance Indicator: Distinguish major innovators, historical developments and potential applications of biotechnology in aquaculture.	
Level 1	
CT-AQ.16.01.01.a. Define biotechnology and explore the historical impact it has had on agriculture.	RST.9-10.4
CT-AQ.09.01.02.a. Investigate current applications of biotechnology in aquaculture.	RST.9-10.3
CT-AQ.09.01.03.a. Examine potential future applications of biotechnology in aquaculture and compare them with alternative approaches to improving aquaculture.	RST.9-10.3
Level 2	
CT-AQ.09.01.01.b. Create a timeline and use it to explain the developmental progression of biotechnology.	WHST.11-12.4
CT-AQ.09.01.02.b. Research and report on current work being done in aquacultural biotechnology.	WHST.11-12.7
CT-AQ.09.01.03.b. Research and report on emerging problems and issues associated with aquacultural biotechnology.	WHST.11-12.7
Level 3	
CT-AQ.09.01.01.c. Research and report on the major innovators and milestones in the development of biotechnology.	
CT-AQ.09.01.02.c. Analyze the scope and impact of aquacultural	

CT Aquaculture Standards 9-12	Common Core State Standards English Language Arts
biotechnology in today's global society.	
CT-AQ.09.01.03.c. Assess the future impact aqua cultural biotechnology could have on world populations.	
CT-AQ.09.02. Performance Indicator: Determine regulatory issues and identify agencies associated with biotechnology.	
Level 1	
CT-AQ.09.02.01.a. Describe the role of agencies that regulate biotechnology.	SL.9-10.4
Level 2	
CT-AQ.09.02.01.b. Interpret the major regulatory issues related to biotechnology.	WHST.11-12.9
Level 3	
CT-AQ.09.02.01.c. Research, evaluate and articulate a major regulatory issue pertaining to biotechnology.	
CT-AQ.09.03. Performance Indicator: Analyze the ethical, legal, social and cultural issues relating to biotechnology.	
Level 1	
CT-AQ.09.03.01.a. Explore ethical, legal and social biotechnology issues	SL.9-10.3
CT-AQ.09.03.02.a. Explore the emergence, evolution and implications of bioethics	SL.9-10.3
CT-AQ.09.03.03.a. Explain the meaning of intellectual properties as related to biotechnology.	SL.9-10.4
Level 2	
CT-AQ.09.03.01.b. Evaluate the benefits and risks associated with biotechnology.	WHST.11-12.9
CT-AQ.09.03.02.b. Examine an ethical dilemma associated with biotechnology by identifying its components.	WHST.11-12.9
CT-AQ.09.03.03.b. Examine intellectual properties associated with biotechnology by defining their components.	WHST.11-12.9
Level 3	
CT-AQ.09.03.01.c. Research, evaluate and articulate the implications of an ethical, legal, social or cultural biotechnology issue.	
CT-AQ.09.03.02.c. Research and debate an ethical issue associated with biotechnology.	
CT-AQ.09.03.03.c. Analyze an intellectual property issue associated with bioethics.	
CT-AQ.10.01. Performance Indicator: Maintain and interpret biotechnology laboratory records.	
Level 1	
CT-AQ.10.01.01.a. Maintain a biotechnology laboratory notebook.	WHST.9-10.4
Level 2	
CT-AQ.10.01.01.b. Analyze strengths of the research based on data and procedures, and propose future investigation.	RST.11-12.7
Level 3	
CT-AQ.10.01.01.c. Utilize external reviews and compares them to research conducted.	
CT-AQ.10.02. Performance Indicator: Operate biotechnology laboratory equipment according to standard procedures.	

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Level 1	
CT-AQ.10.02.01.a. Operate basic laboratory equipment and measurement devices.	RST.9-10.3
Level 2	
CT-AQ.10.02.01.b. Operate advanced laboratory equipment and measurement devices.	RST.11-12.3
Level 3	
CT-AQ.10.02.01.c. Calibrate laboratory equipment and conduct instrument qualification tests.	
CT-AQ.10.03. Performance Indicator: Demonstrate proper laboratory procedures using biological materials.	
Level 1	
CT-AQ.10.03.01.a. Demonstrate basic aseptic techniques in the biotechnology laboratory.	RST.9-10.3
CT-AQ.10.03.02.a. Perform procedures with biological materials according to directions.	RST.9-10.3
Level 2	
CT-AQ.10.03.01.b. Demonstrate advanced aseptic techniques in the biotechnology laboratory.	RST.11-12.3
CT-AQ.10.03.02.b. Select an appropriate standard operating procedure for working with biological materials.	RST.11-12.3
Level 3	
CT-AQ.10.03.01.c. Perform bioassays and experiments under aseptic conditions.	
CT-AQ.10.03.02.c. Develop a standard operating procedure for a biological process.	
CT-AQ.10.04. Performance Indicator: Perform microbiology, molecular biology, enzymology and immunology procedures.	
Level 1	
CT-AQ.10.04.01.a. Differentiate the types of organisms and demonstrate how to handle them safely.	WHST.9-10.9
CT-AQ.10.04.02.a. Explain the structures of DNA and RNA and how genotype influences phenotype.	SL.9-10.4
CT-AQ.10.04.03.a. Extract and purify DNA and RNA.	RST.9-10.3
CT-AQ.10.04.04.a. Perform simple enzyme activity assays to detect proteins	RST.9-10.3
CT-AQ.10.04.05.a. Describe how antibodies are formed and how they can be used in biotechnology applications.	SL.9-10.4
CT-AQ.10.04.06.a. Explain reasons for detecting microbes and identify sources of microbes	SL.9-10.4
Level 2	
CT-AQ.10.04.01.b. Isolate maintains, quantify and store cell cultures.	RST.11-12.3
CT-AQ.10.04.02.b. Explain the molecular basis for heredity and the tools and techniques used in DNA and RNA manipulations.	SL.11-12.4
CT-AQ.10.04.03.b. Perform electrophoretic techniques and interpret electrophoresis fragmentation patterns.	RST.11-12.3
CT-AQ.10.04.04.b. Perform protein separation techniques and interpret the results.	RST.11-12.3
CT-AQ.10.04.05.b. Conduct an Enzyme-Linked Immunosorbent Assay	RST.11-12.3

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(ELISA).	
CT-AQ.10.04.06.b. Research and describe the use of biotechnology to detect microbes.	RST.11-12.3
Level 3	
CT-AQ.10.04.01.c. Characterize the physical, chemical and biological properties of microbes.	
CT-AQ.10.04.02.c. Analyze factors that influence gene expression.	
CT-AQ.10.04.03.c. Perform DNA and RNA manipulations, such as cloning/sub cloning, blotting, sequencing and amplification	
CT-AQ.10.04.04.c. Characterize the biochemical properties of proteins.	
CT-AQ.10.04.05.c. Use antibodies to detect and quantify antigens.	
CT-AQ.10.04.06.c. Design and perform an assay to detect a target microorganism in food, water or the environment.	
CT-AQ.11.01. Performance Indicator: Evaluate the application of genetic engineering to improve products of aquaculture.	
Level 1	
CT-AQ.11.01.01.a. Explain biological, social, agronomic and economic reasons for genetic modification of eukaryotes.	SL.9-10.4
CT-AQ.11.01.02.a. Describe enzymes, the changes they cause in foods and the physical and chemical parameters that affect enzymatic reactions.	SL.9-10.4
CT-AQ.11.01.03.a. Compare and contrast the use of natural organisms and genetically engineered organisms in the treatment of wastes	
CT-AQ.11.01.04.a. Describe the benefits and risks associated with the use of biotechnology to increase productivity and improve quality of aquatic species.	SL.9-10.4
Level 2	
CT-AQ.11.01.01.b. Diagram the processes and describe the techniques used to produce transgenic eukaryotes.	SL.11-12.4
CT-AQ.11.01.02.b. Describe processes by which enzymes are produced through biotechnology.	
CT-AQ.11.01.03.b. Diagram the processes by which organisms are genetically engineered for waste treatment.	
CT-AQ.11.01.04.b. Investigate and report on genetic engineering procedures used in the production of aquatic species.	WHST.11-12.7; WHST.11-12.9
Level 3	
CT-AQ.11.01.01.c. Design and conduct an experiment to evaluate an existing transgenic eukaryote.	
CT-AQ.11.01.02.c. Use biotechnology tools or microbial strain selection to improve or discover enzymes for use in food processing.	
CT-AQ.11.01.03.c. Monitor and evaluate the treatment of a waste product using a genetically engineered organism.	
CT-AQ.11.01.04.c. Conduct field or clinical trials for genetically modified aquatic species.	
CT-AQ.11.02. Performance Indicator: Perform biotechnology processes used in aquaculture	
Level 1	
CT-AQ.11.02.01.a. Explain the process of transesterification.	SL.9-10.4
Level 2	

CT Aquaculture Standards 9-12	Common Core State Standards English Language Arts
CT-AQ.11.02.01.b. Diagram the process used in producing biodiesel from biomass	
Level 3	
CT-AQ.11.02.01.c. Produce biodiesel and co-products from biomass.	
CT-AQ.11.03. Performance Indicator: Use biotechnology to monitor and evaluate procedures performed in AFNR systems.	
Level 1	
CT-AQ.11.03.01.a. Describe the selective plant breeding process.	SL.9-10.4
CT-AQ.11.03.02.a. Describe biotechnology processes applicable to aquatic species health.	SL.9-10.4
CT-AQ.11.03.03.a. Give examples of instances in which bioremediation can be applied to clean up environmental contaminants.	SL.9-10.4
CT-AQ.11.03.04.a. Explain the use of microorganisms in biological waste management.	SL.9-10.4
CT-AQ.11.03.05.a. Explain the role of microorganisms in aqua cultural chemical waste treatment.	SL.9-10.4
CT-AQ.11.03.06.a. Explain the global importance of biodiversity.	SL.9-10.4
CT-AQ.11.03.07.a. Explain the consequences of aqua cultural practices on wild populations.	SL.9-10.4
CT-AQ.11.03.08.a. Explain biomass and sources of biomass.	SL.9-10.4
Level 2	
CT-AQ.11.03.01.b. Select biotechnology tools used to monitor and direct plant breeding.	WHST.11-12.9
CT-AQ.11.03.02.b. Assess the benefits, risks and opportunities associated with using biotechnology to promote animal health.	
CT-AQ.11.03.03.b. Describe the use of biotechnology in bioremediation.	SL.11-12.4
CT-AQ.11.03.04.b. Describe the processes involved in bio treatment of biological wastes.	SL.11-12.4
CT-AQ.11.03.05.b. Interpret the processes involved in bio treatment of aqua cultural chemical wastes	RST.11-12.4
CT-AQ.11.03.06.b. Select biotechnology tools used to measure biodiversity	RST.11-12.3
CT-AQ.11.03.07.b. Explain how biotechnology tools can be used to monitor the effects of aqua cultural practices on wild populations	SL.11-12.4
CT-AQ.11.03.08.b. Assess the characteristics of biomass that make it useful for biofuels production.	RST.11-12.3
Level 3	
CT-AQ.11.03.01.c. Design and conduct an experiment using biotechnology tools to evaluate selectively bred plants.	
CT-AQ.11.03.02.c. Design animal-care protocols that use biotechnology tools to ethically monitor and promote aquaculture.	
CT-AQ.11.03.03.c. Monitor and evaluate the effectiveness of bioremediation efforts by participating in a bioremediation project.	
CT-AQ.11.03.04.c. Monitor and evaluate the treatment of biological wastes with microorganisms.	
CT-AQ.11.03.05.c. Monitor and evaluate the treatment of aqua cultural chemical wastes with microorganisms.	
CT-AQ.11.03.06.c. Use biotechnology tools to measure biodiversity in a population.	

CT Aquaculture Standards 9-12	Common Core State Standards English Language Arts
CT-AQ.11.03.07.c. Analyze the implications of biotechnology on wild species.	
CT-AQ.11.03.08.c. Evaluate the technologies used to create biofuels from biomass.	
CT-AQ.21.01. Performance Indicator: Apply hydrology principles to aquaculture.	
Level 1	
CT-AQ.12.01.01.a. Describe the world's water supplies and discusses the many uses of water.	SL.9-10.4
CT-AQ.12.01.02.a. Demonstrate knowledge of hydrogeology by differentiating between groundwater and surface water.	RST.9-10.4
CT-AQ.12.01.03.a. Define groundwater potential.	RST.9-10.4
CT-AQ.12.01.04.a. Identify environmental hazards associated with groundwater supplies.	WHST.9-10.9
CT-AQ.12.01.04.a. Identify water quality factors affecting aquaculture production (A14).*	WHST.9-10.9
Level 2	
CT-AQ.12.01.01.b. Describe characteristics of water that influence the biosphere and sustain life.	SL.11-12.4
CT-AQ.12.01.02.b. Describe interactions between groundwater and surface water.	SL.11-12.4
CT-AQ.12.01.03.b. Identify differences in groundwater potential.	RST.11-12.4
CT-AQ.21.03.04.b. Describe precautions taken to prevent/reduce contamination of groundwater supplies.	SL.11-12.4
Level 3	
CT-AQ.12.01.01.c. Research and debate one or more current environmental issues associated with the supplies of groundwater and surface water.	
CT-AQ.12.01.02.c. Use groundwater-flow equations and Darcy's Law to explain how geology and meteorology affect groundwater and groundwater flow.	
CT-AQ.12.01.03.c. Delineate groundwater potential zones.	
CT-AQ.12.01.04.c. Test and document the quality of groundwater supplies.	
CT-AQ.12.02. Performance Indicator: Apply principles of wastewater treatment to manage wastewater disposal in keeping with rules and regulations.	
Level 1	
CT-AQ.12.02.01.a. Define wastewater	RST.9-10.4
Level 2	
CT-AQ.12.02.01.b. Diagram the steps in wastewater treatment.	
Level 3	
CT-AQ.12.02.01.c. Demonstrate the use of water-testing instruments and water-treatment equipment to treat wastewater.	
CT-AQ.12.03. Performance Indicator: Manage hazardous materials to assure a safe facility and to comply with applicable regulations.	
Level 1	
CT.12.03.01.a. Identify types of hazardous materials.	RST.9-10.4
Level 2	

CT Aquaculture Standards 9-12	Common Core State Standards English Language Arts
CT-AQ.12.03.01.b. Describe risks related to hazardous materials and describe health and safety practices to reduce risks from hazardous materials.	SL.11-12.4
Level 3	
CT-AQ.12.03.01.c. Describe the procedures for the treatment and disposal of hazardous materials and hazardous waste.	
CT-AQ.13.01. Performance Indicator: Design vehicles, vessels and equipment for aquaculture production.	
Level 1	
CT-AQ.13.01.01.a. Identify vehicles, tools and equipment used for aquaculture.	WHST.9-10.9
CT-AQ.13.01.02.a. Repair and maintain vehicles, tools and equipment.	
CT-AQ.13.01.03.a. Identify principles, equipment and procedures related to the production, harvesting and processing of aquaculture products and species (A8).*	WHST.9-10.9
Level 2	
CT-AQ.13.01.01.b. Critique designs for vehicles, tools and equipment used in aquaculture.	RST.11-12.9
CT-AQ.13.01.02.b. Determine costs and expenses of aquaculture vehicles, tools and equipment.	WHST.11-12.9
Level 3	
CT-AQ.13.01.01.c. Design vehicles, vessels, tools and equipment used in aquaculture.	
CT-AQ.13.01.02.c. Build industry appropriate marine vehicles and ancillary infrastructure based on industry standards.	
CT-AQ.13.02. Performance Indicator: Demonstrate the ability to perform safely with aquaculture production vehicles, tools and equipment.	
Level 1	
CT-AQ.13.02.01.a. List the general standards (e.g., environmental, USCG, DEP, ABYC) specific to aquaculture.	WHST.9-10.4
CT-AQ.13.02.02.a. Define proper vocabulary necessary for safe operation of marine vehicles, tools and equipment used in aquaculture.	RST.9-10.4
CT.13.03.03.a. Understand principles of boating safety and handling (A17).*	WHST.9-10.9
Level 2	
CT-AQ.13.02.01.b. Evaluate aquaculture vehicles, tools and equipment to determine if standards have been met.	RST.11-12.9
CT-AQ.13.02.02.b. Identify all aspects of vehicles, tools and equipment in aquaculture.	WHST.11-12.9
Level 3	
CT-AQ.13.02.01.c. Design vehicles, tools and equipment that meets standards for aquaculture.	
CT-AQ.13.02.0.c. Operate, maintain and repair vehicles, tools and equipment in aquaculture.	

Natural Resources Systems

Natural Resources System	Connecticut State Standards English Language Arts
NRS.01.01. Performance Indicator: Classify measure and survey natural resources to create planning data.	
Level 1	
CT-NRS.01.01.01.a. Define ecosystem and related terms.	WHST 9-10.9
CT-NRS.01.01.02.a. Describe morphological characteristics used to identify trees and other woody plants, herbaceous plants, wildlife and aquatic species native to New England.	SL 9-10.4
CT-NRS.01.01.03.a. Demonstrate techniques used to identify rock, mineral and soil types.	RST 9-10.3
CT-NRS.01.01.03.a Identify native New England tree species and their products (A.3).*	RST 9-10.3
Level 2	
CT-NRS.01.01.01.b. Describe the interdependence of organisms within an ecosystem.	SL 11-12.4
CT-NRS.01.01.02.b. Identify trees and other woody plants, herbaceous plants, wildlife, and aquatic species native to New England.	RST 11-12.3
CT-NRS.01.01.03.b. Identify rock, mineral and soil types.	RST 11-10.3
CT-NRS.01.01.03.b Understand the procedures for conducting resource inventories and population studies (A.2).*	RST 11-12.3
Level 3	
CT-NRS.01.01.01.c. Conduct a field studies of an ecosystem and record and document observations of species interactions.	
CT-NRS.01.01.02.c. Conduct a field inventory of trees and other woody plants, herbaceous plants, wildlife, and aquatic species, record, native to New England, and analyze data to create a management plan.	
CT-NRS.01.01.03.c. Conduct a field inventory of rock, mineral and soil types, and record and document findings.	
CT-NRS.02.01. Performance Indicator: Develop a safety plan for work with natural resources.	
Level 1	
CT-NRS.02.01.01.a. Identify hazards associated with the outdoor environment.	WHST 9-10.9
CT-NRS.02.01.02.a. Recognize biohazards associated with natural resources.	WHST 9-10.9
Level 2	
CT-NRS.02.01.01.b. Demonstrate safety practices when working in an outdoor environment.	WHST 11-12.9
CT-NRS.02.01.02.b. Use appropriate techniques and equipment when working with biohazards.	WHST 11-12.9
Level 3	
CT-NRS.02.01.01.c. Demonstrate appropriate responses to accidents and injuries that occur in an outdoor environment.	
CT-NRS.02.01.02.c. Demonstrate appropriate responses for disasters involving bio hazardous materials.	
CT-NRS.02.02. Performance Indicator: Demonstrate cartographic skills to aid in developing, implementing and evaluating natural resource management plans.	
Level 1	

Natural Resources System	Connecticut State Standards English Language Arts
CT-NRS.02.02.01.a. Demonstrate how to use maps to identify directions and features, calculate actual distance and determine the elevations of points.	WHST 9-10.9
CT-NR.02.02.02.a Understand drawings, prints, maps and navigational technology used in natural resources (A.6).*	WHST 9-10.9, RST 9-10.4
Level 2	
CT-NRS.02.02.01.b. Locate natural resources using a land survey and geographic coordinate system.	RST 10-12.4
CT-NR.02.02.02.b Follow a drawing or print to carry out a task	RST 11-12.4
Level 3	
CT-NRS.02.02.01.c. Employ Global Positioning System and Geographic Information Systems technologies to inventory features in natural resource management.	
CT-NR.02.02.02.c Create drawings and prints to carry out a task.	
CT-NRS.02.03. Performance Indicator: Demonstrate natural resource enhancement techniques.	
Level 1	
CT-NRS.02.03.01.a. Identify the different kinds of streams.	RST 9-10.3
CT-NRS.02.03.02.a. Identify characteristics of a healthy forest.	RST 9-10.3
CT-NRS.02.03.03.a. Identify characteristics of a healthy wildlife habitat.	RST 9-10.3
CT-NRS.02.03.04.a. Identify natural resource characteristics desirable for recreational purposes.	RST 9-10.3
CT-NRS.02.03.05.a. Identify characteristics of healthy marine and coastal natural resources.	RST 9-10.3
Level 2	
CT-NRS.02.03.01.b. Identify indicators of the biological health of a stream.	RST 11-12.3
CT-NRS.02.03.02.b. Identify ways in which forest stands may be improved.	RST 11-12.3
CT-NRS.02.03.03.b. Identify methods of wildlife habitat improvement.	RST 11-12.3
CT-NRS.02.03.04.b. Identify natural resource management techniques for improving recreation opportunities.	RST 11-12.3
CT-NRS.02.03.05.b. Identify methods to improve marine and coastal natural resources.	RST 11-12.3
Level 3	
CT-NRS.02.03.01.c. Create and implement a stream enhancement plan.	
CT-NRS.02.03.02.c. Formulate a timber stand improvement plan for a forest.	
CT-NRS.03.04.03.c. Conduct a survey of a habitat and devise a comprehensive improvement plan.	
CT-NRS.02.03.04.c. Evaluate the impact of recreational activities on natural resources and create an improvement plan.	
CT-NRS.02.03.05.c. Assess marine and coastal natural resources and prepare an improvement plan.	
CT-NRS.02.04. Performance Indicator: Interpret laws related to natural resource management and protection.	
Level 1	
CT-NRS.02.04.01a Understand environmental protection laws and policy related to natural resources management and protection. (A.10).*	WHST 9-10.9
CT-NRS.02.04.02.a. Define mitigation.	RST 9-10.4

Natural Resources System	Connecticut State Standards English Language Arts
Level 2	
CT-NRS.02.04.01.b. Identify the purposes of laws and policies associated with natural resource systems.	WHST 11-12.9
CT-NRS.02.04.02.b. Identify issues involving mitigation of natural resources.	WHST 11-12.9
Level 3	
CT-NRS.02.04.01.c. Abide by specific laws and policies pertaining to natural resource systems.	
CT-NRS.02.04.02.c. Demonstrate mitigation techniques for natural resources.	
CT-NRS.02.05. Performance Indicator: Manage hazardous materials to assure a safe facility and to comply with applicable regulations.	
Level 1	
CT-NRS.02.05.01.a. Identify types of hazardous materials.	RST 9-10.3
Level 2	
CT-NRS.02.05.01.b. Describe risks related to hazardous materials and describe health and safety practices to reduce risks from hazardous materials.	SL 11-12.4
Level 3	
CT-NRS.02.05.01.c. Describe the procedures for the treatment and disposal of hazardous materials and hazardous waste.	
CT-NRS.02.06. Performance Indicator: Apply ecological concepts and principles to natural resource systems.	
Level 1	
CT-NRS.02.06.01.a. Identify biogeochemical cycles.	RST 9-10.3
CT-NRS.02.06.02.a. Describe properties of watersheds and identify the boundaries of local watersheds.	SL 9-10.4
CT-NRS.02.06.03.a. Compare and contrast groundwater and surface-water flow.	
CT-NRS.02.06.04.a. Define riparian zones and riparian buffers, and explain their functions.	RST 9-10.4
CT-NRS.02.06.05.a. Describe the processes associated with ecological succession.	WHST 9-10.9
CT-NRS.02.06.06.a. Explain population ecology, population density and population dispersion.	SL 9-10.4
CT-NRS.02.06.07.a. Identify invasive species and their impact on natural resources in the northeast (A7).*	RST 9-10.3
CT-NRS.02.06.08.a. Describe sources of pollution and delineate between point and nonpoint source pollution.	SL 9-10.4
CT-NRS.02.06.09.a. Describe climatic factors that influence natural resources.	SL 9-10.4
Level 2	
CT-NRS.02.06.01.b. Diagram biogeochemical cycles and explains the processes.	SL 11-12.4, RST 11-12.4
CT-NRS.02.06.02.b. Relate the function of watersheds to natural resources.	WHST 11-12.9
CT-NRS.02.06.03.b. Explain stream hydrology and structure, and determine the different classes of streams.	SL 11-12.4, RST 11-12.3
CT-NRS.02.06.04.b. Identify techniques used in the creation, enhancement and management of riparian zones and riparian buffers.	RST 11-12.3

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CT-NRS.02.06.05.b. Give examples of primary-succession and secondary-succession species in a community of organisms.	SL 11-12.4
CT-NRS.02.06.06.b. Discuss factors that influence population density and population dispersion.	SL 11-12.1
CT-NRS.02.06.07.b. Discuss factors that influence the establishment, spread and impact of invasive species.	SL 11-12.1
CT-NRS.02.06.08.b. Describe the impact of pollution on natural resources.	SL 11-12.4
CT-NRS.02.06.09.b. Describe the impact climate has on natural resources.	SL 11-12.4
Level 3	
CT-NRS.02.06.01.c. Determine the human influence on biogeochemical cycles.	
CT-NRS.02.06.02.c. Analyze ecosystem functions of a watershed.	
CT-NRS.02.06.03.c. Classify and predict the behavior of local streams.	
CT-NRS.02.06.04.c. Create, enhance and manage riparian zones and riparian buffers.	
CT-NRS.02.06.05.c. Conduct a field studies to determine the stages of ecological succession in a community of organisms.	
CT-NRS.02.06.06.c. Create and implement a management plan based on a population study for a community of organisms.	
CT-NRS.02.06.07.c. Develop and implement a plan to reduce the impact of invasive species on natural resources.	
CT-NRS.02.06.08.c. Create and implement a plan to prevent or limit the effects of pollution on natural resources.	
CT-NRS.02.06.09.c. Monitor the effects of climate on plants and wildlife.	
CT-NRS.03.01. Performance Indicator: Produce, harvest, process and use natural resource products.	
Level 1	
CT-NRS.03.01.01.a. Describe forest harvesting methods.	SL 9-10.4
CT-NRS.03.01.02.a. Identify native New England tree species and their products (A.3).*	RST 9-10.3
CT-NRS.03.01.03.a. Identify wildlife species that can be sustainably harvested.	RST 9-10.3
CT-NRS.03.01.04.a. Describe the value of fossil fuels to the economy.	SL 9-10.4
CT-NRS.03.01.05.a. Identify recreational uses of natural resources (A8).*	RST 9-10.3
CT-NRS.03.01.06.a. Identify aquatic species harvested for commercial and recreational purposes.	RST 9-10.3
CT-NRS.03.01.07.a. Identify uses of aquatic species.	RST 9-10.3
Level 2	
CT-NRS.03.01.01.b. Determine when to harvest forest products.	RST 11-12.3
CT-NRS.03.01.02.b. Describe processing of forest products.	SL 11-12.4
CT-NRS.03.01.03.b. Describe techniques used in the harvesting of wildlife.	SL 11-12.4
CT-NRS.03.01.04.b. Describe sources of fossil fuels and products made from fossil fuels.	SL 11-12.4
CT-NRS.03.01.05.b. Debate an issue related to the recreational use of natural resources.	SL 11-12.1
CT-NRS.03.01.06.b. Describe techniques used to harvest aquatic species.	SL 11-12.4
CT-NRS.03.01.07.b. Explain techniques used to process aquatic species.	SL 11-12.4

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Level 3	
CT-NRS.03.01.01.c. Harvest forest products according to principles of sustainable forest management.	
CT-NRS.03.01.02.c. Process forest products.	
CT-NRS.03.01.03.c. Formulate a management plan for protecting wildlife from overexploitation.	
CT-NRS.03.01.04.c. Give examples of methods used to extract and process fossil fuels.	
CT-NRS.03.01.05.c. Evaluate a natural resource site and recommend opportunities for recreational activities.	
CT-NRS.03.01.06.c. Harvest aquatic species according to sustainable management principles.	
CT-NRS.03.01.07.c. Process harvested aquatic species.	
CT-NRS.04.01. Performance Indicator: Diagnose plant and wildlife diseases and follow protocol to prevent their spread.	
Level 3	
CT-NRS.04.01.01.a. Identify causes of diseases in plants.	
CT-NRS.04.01.02.a. Identify causes of diseases in wildlife.	
CT-NRS.04.01.03.a. Identify concepts and techniques used in environmental conservation law enforcement.	
Level 3	
CT-NRS.04.01.01.b. Report the observance of diseases affecting plants to the appropriate authorities.	
CT-NRS.04.01.02.b. Report the observance of diseases affecting wildlife to the appropriate authorities.	
CT-NRS.04.01.03.b. Explain the importance of concepts and techniques in environmental conservation law enforcement and the impact illegal activities have on the environment.	
Level 3	
CT-NRS.04.01.01.c. Explain management techniques used to reduce infection and spread of plant diseases in natural resources.	
CT-NRS.04.01.02.c. Discuss various methods of disease and pest control in the natural environment (A4).*	
CT-NRS.04.02. Performance Indicator: Manage insect infestations of natural resources.	
Level 1	
CT-NRS.04.02.01.a. Identify harmful and beneficial insects and signs of insect damage to natural resources.	RST 9-10.3
Level 2	
CT-NRS.04.02.01.b. Report observance of insect pests to the appropriate authorities.	WHST 11-12.1
Level 3	
CT-NRS.04.02.01.c. Describe techniques used to manage pests of natural resources.	SL 11-12.4
CT-NRS.05.01. Performance Indicator: Communicate natural resource information to the public.	
Level 1	
CT-NRS.05.01.01.a. Identify ways in which a message regarding natural resources may be communicated to the public.	RST 9-10.3
Level 2	

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CT-NRS.05.01.01.b. Design and construct a display that communicates a natural resource topic and discusses the topic in a public forum.	SL 11-12.4
Level 3	
CT-NRS.05.01.01.c. Communicate a natural resource message through the press, radio, television or public appearances.	
CT-NRS.06.01. Performance Indicator: Apply soil science principles to environmental service systems.	
Level 1	
CT-NRS.06.01.01.a. Explain the process of soil formation through weathering.	SL 9-10.4
CT-NRS.06.01.02.a. Describe the biodiversity found in soil and the contribution of biodiversity to the physical and chemical characteristics of soil.	SL 9-10.4
CT-NRS.06.01.03.a. Explain how the physical qualities of the soil influence the infiltration and percolation of water.	SL 9-10.4
CT-NRS.06.01.04.a. Identify land uses, capability factors and land capability classes.	RST 9-10.3
Level 2	
CT-NRS.06.01.01.b. Differentiate rock types and relate the chemical composition of mineral matter in soils to the parent material.	RST 11-12.3
CT-NRS.06.01.02.b. Relate the activities of microorganisms in soil to environmental service systems.	
CT-NRS.06.01.03.b. Identify the physical qualities of the soil that determine its use for environmental service systems.	RST 11-12.3
CT-NRS.06.01.04.b. Use a soil survey to determine the land capability classes for different parcels of land in an area.	RST 11-12.3
Level 3	
CT-NRS.06.01.01.c. Apply knowledge of soil orders to environmental service systems.	
CT-NRS.06.01.02.c. Evaluate the uses of soil microorganisms in environmental service systems.	
CT-NRS.06.01.03.c. Conduct tests of soil to determine its use for environmental service systems.	
CT-NRS.06.01.04.c. Design a master land-use management plan for a given area.	
CT-NRS.06.02. Performance Indicator: Apply hydrology principles to environmental service systems.	
Level 1	
CT-NRS.06.02.01.a. Describe the world's water supplies and discusses the many uses of water.	SL 9-10.4
CT-NRS.06.02.02.a. Demonstrate knowledge of hydrogeology by differentiating between groundwater and surface water.	RST 9-10.3
CT-NRS.06.02.03.a. Define groundwater potential.	RST 9-10.4
CT-NRS.06.02.04.a. Identify environmental hazards associated with groundwater supplies.	RST 9-10.4
Level 2	
CT-NRS.06.02.01.b. Describe characteristics of water that influence the biosphere and sustain life.	SL 11-12.4
CT-NRS.06.02.02.b. Describe interactions between groundwater and surface water.	SL 11-12.4

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CT-NRS.06.02.03.b. Identify differences in groundwater potential.	RST 11-12.3
CT-NRS.06.02.04.b. Describe precautions taken to prevent/reduce contamination of groundwater supplies.	SL 11-12.4
Level 3	
CT-NRS.06.02.01.c. Research and debate one or more current environmental issues associated with the supplies of groundwater and surface water.	
CT-NRS.06.02.02.c. Use groundwater-flow equations and Darcy's Law to explain how geology and meteorology affect groundwater and groundwater flow.	
CT-NRS.06.02.03.c. Delineate groundwater potential zones.	
CT-NRS.06.02.04.c. Test, document and monitor the quality of groundwater supplies.	
CT-NRS.07.01. Performance Indicator: Use pollution control measures to maintain a safe facility environment.	
Level 1	
CT-NRS.07.01.01.a. Identify types of pollution and distinguish between point source and nonpoint source pollution.	RST 9-10.3
CT-NRS.07.01.02.a. Describe ways in which pollution can be managed and prevented.	SL 9-10.4
CT-NRS.07.01.03.a. Identify types of air pollutants and their sources.	RST 9-10.3
Level 2	
CT-NRS.07.01.01.b. Give examples of how industrial and nonindustrial pollution has damaged the environment.	SL 11-12.4
CT-NRS.07.01.02.b. Conduct tests to determine the presence and extent of pollution.	WHST 11-12.7
CT-NRS.07.01.03.b. Determine and describe impact air quality has on the environment and society.	SL 11-12.4, RST 11-12.4
Level 3	
CT-NRS.07.01.01.c. Survey the local area for evidence of industrial and nonindustrial pollution.	
CT-NRS.07.01.02.c. Plan and develop a pollution remediation, management or prevention program.	
CT-NRS.07.01.03.c. Monitor air quality and assess environmental risks.	
CT-NRS.07.02. Performance Indicator: Manage safe disposal of all categories of solid waste.	
Level 1	
CT-NRS.07.02.01.a. Understand appropriate soil, air and water monitoring and waste management practices (A9).*	WHST 9-10.9
CT-NRS.07.02.02.a. Discuss practical management options for treating solid waste.	SL 9-10.4
CT-NRS.07.02.03.a. Define sanitary landfill.	RST 9-10.4
CT-NRS.07.02.04.a. Define compost and composting.	RST 9-10.4
CT-NRS.07.02.05.a. Explain the basic concepts associated with solid waste incineration.	SL 9-10.4
CT-NRS.07.02.06.a. Explain the importance of recycling.	SL 9-10.4
Level 2	
CT-NRS.07.02.01.b. Evaluate environmental hazards created by different types of solid waste, solid waste accumulation and solid waste disposal.	RST 11-12.3
CT-NRS.07.02.02.b. Identify characteristics of solid waste treatment and	RST 11-12.3

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recognize the byproducts of solid waste treatment.	
CT-NRS.07.02.03.b. Explain basic sanitary landfill operating procedures and design.	SL 11-12.4
CT-NRS.07.02.04.b. Explain scientific principles related to composting.	SL 11-12.4
CT-NRS.07.02.05.b. Describe the environmental impact of solid waste incineration.	SL 11-12.4
CT-NRS.07.02.06.b. Describe recycling methods and identify materials that can be recycled.	SL 11-12.4
Level 3	
CT-NRS.07.02.01.c. Analyze environmental hazards associated with the identification and acceptance of solid waste disposal sites.	
CT-NRS.07.02.02.c. Collect and treat solid waste materials.	
CT-NRS.07.02.03.c. Evaluate sanitary landfill procedures.	
CT-NRS.07.02.04.c. Evaluate methods of operating a composting facility.	
CT-NRS.07.02.05.c. Evaluate methods of incinerating solid waste, including those used in waste-to-energy plants.	
CT-NRS.07.02.06.c. Survey and evaluate local recycling programs and procedures.	
CT-NRS.08.01. Performance Indicator: Develop skill in the safe use of natural resources related tools and equipment.	
Level 1	
CT-NRS.08.01.01.a. Identify tools, materials and equipment for use in natural resources (A1).*	RST 9-10.3
Level 2	
CT-NRS.08.01.01.b. Describe the proper safe use or function of tools, materials and equipment for use in natural resources.	SL 11-12.4
Level 3	
CT-NRS.08.01.01.c. Demonstrate the safe use of tools, materials and equipment for use in natural resources.	

Plant Science Systems

CT Plant Science Standards 9-12	Connecticut State Standards English Language Arts
CT-PS.01.01. Performance Indicator: Classify agricultural plants according to taxonomy systems.	
Level 1	
CT-PS.01.01.01.a. Explain systems used to classify plants.	RST.9-10.10; RST11-12.10; RST.9-10.4; RST.11-12.4; WHST.9-10.4; WHST.11-12.4
CT-PS.01.01.02.a. Apply knowledge of plant anatomy and classification to horticultural plant production (A1).*	RST.9-10.10; RST11-12.10; RST.9-10.5; RST.11-12.5
Level 2	
CT-PS.01.01.01.b. Identify plants important to the Connecticut Horticulture industry by common names.	RST.9-10.10; RST11-12.10
Level 3	
CT-PS.01.01.01.c. Identify plants important to the Connecticut Horticulture industry by scientific names.	
CT-PS.01.02. Performance Indicator: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.	
Level 1	
CT-PS.01.02.01.a. Diagram a typical plant cell and identify plant cell organelles and their functions.	RST.9-10.10; RST11-12.10
CT-PS.01.02.02.a. Identify the components, the types and the functions of plant roots.	RST.9-10.10; RST11-12.10
CT-PS.01.02.03.a. Identify the components and the functions of plant stems.	RST.9-10.10; RST11-12.10
CT-PS.01.02.04.a. Discuss leaf morphology and the functions of leaves.	RST.9-10.10; RST11-12.10
CT-PS.01.02.05.a. Identify the components of a flower, the functions of a flower and the functions of flower components.	RST.9-10.10; RST11-12.10
CT-PS.01.02.06.a. Explain the functions and components of seeds and fruit.	RST.9-10.10; RST11-12.10; WHST.9-10.4; WHST.11-12.4
Level 2	
CT-PS.01.02.01.b. Describe the processes of mitosis and meiosis as they relate to plant growth and development.	RST.9-10.10; RST11-12.10; RST.9-10.2; RST.11-12.2; RST.9-10.4, RST.11-12.4
CT-PS.01.02.02.b. Identify the different types or root systems on plant species important to the Connecticut Horticulture industry.	RST.9-10.10; RST11-12.10
CT-PS.01.02.03.b. Describe the processes of translocation.	RST.9-10.10; RST11-12.10; RST.9-10.2; RST.9-10.4; RST.11-12.2; RST.11-12.4; WHST.9-10.4; WHST.11-12.4
CT-PS.01.02.04.b. Explain how leaves capture light energy and allow for the exchange of gases.	RST.9-10.10; RST11-12.10; RST.9-10.2; RST.9-10.4; RST.11-12.2; RST.11-12.4; WHST.9-10.4; WHST.11-12.4
CT-PS.01.02.05.b. Identify the different types and forms of flowers based on their botanical structure.	RST.9-10.10; RST11-12.10
CT-PS.01.02.06.b. Identify the major types of fruit.	RST.9-10.10; RST11-12.10
Level 3	
CT-PS.01.02.01.c. Apply the knowledge of cell differentiation to plant propagation and production.	RST.9-10.10; RST11-12.10

CT Plant Science Standards 9-12	Connecticut State Standards English Language Arts
CT-PS.01.02.02.c. Apply the knowledge of root structure to plant production, propagation and use by consumers.	RST.9-10.10; RST11-12.10
CT-PS.01.02.03.c. Apply concepts associated with translocation to the management of plants.	RST.9-10.10; RST11-12.10
CT-PS.01.02.04.c. Identify and design systems to manage the capture of light energy.	RST.9-10.10; RST11-12.10
CT-PS.01.02.05.c. Apply the knowledge of flower structures to plant breeding, production and use.	RST.9-10.10; RST11-12.10
CT-PS.01.02.06.c. Apply the knowledge of seed and fruit structures to plant culture and use.	
CT-PS.01.03. Performance Indicator: Apply knowledge of plant physiology and energy conversion to plant systems.	
Level 1	
CT-PS.01.03.01.a. Explain the process of photosynthesis and plant respiration (A2).*	RST.9-10.10; RST11-12.10 RST.9-10.4; RST.11-12.4; WHST.9-10.4; WHST.11-12.4
CT-PS.01.03.02.a. Explain cellular respiration and its importance to plant life.	RST.9-10.10; RST11-12.10 RST.9-10.4; RST.11-12.4; WHST.9-10.4; WHST.11-12.4
CT-PS.01.03.03.a. Describe the role of the apical meristem in primary growth.	RST.9-10.10; RST11-12.10 RST.9-10.5; RST.11-12.5; WHST.9-10.9; WHST.11-12.9
CTPS.01.03.04.a. Identify naturally occurring plant hormones and synthetic growth regulators.	RST.9-10.10; RST11-12.10
Level 2	
CT-PS.01.03.01.b. Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis.	RST.9-10.10; RST11-12.10; RST.9-10.4; RST11-12.4; RST.9-10.5; RST.11-12.5; WHST.9-10.4, WHST.11-12.4
CT-PS.01.03.02.b. Explain factors that affect cellular respiration and identify the products and byproducts of cellular respiration.	RST.9-10.10; RST11-12.10; RST.9-10.4, RST.11-12.4; RST.9-10.5; RST.11-12.5; WHST.9-10.4; WHST.11-12.4; WHST.9-10.7; WHST.9-10.8, WHST9-10.9; WHST.11-12.7; WHST.11-12.8, WHST.11-12.9
CT-PS.01.03.03.b. Identify how common management practices affect plant growth.	RST.9-10.10; RST11-12.10; WHST.9-10.4; WHST.11-12.4
CT-PS.01.03.04.b. Identify the plant responses to plant growth regulators and different forms of tropism.	RST.9-10.10; RST11-12.10; WHST.9-10.7; WHST.9-10.8, WHST9-10.9; WHST.11-12.7; WHST.11-12.8, WHST.11-12.9; RST.9-10.3
Level 3	
CT-PS.01.03.01.c. Explain the light-dependent and light-independent reactions that occur during photosynthesis and apply the knowledge to plant management.	RST.9-10.10; RST11-12.10
CT-PS.01.03.02.c. Explain the process of aerobic respiration and how it relates to plant growth, crop management and post-harvest handling.	RST.9-10.10; RST11-12.10
CT-PS.01.03.03.c. Apply the principles of plant growth and common management practices to horticultural production.	RST.9-10.10; RST11-12.10
CT-PS.01.03.04.c. Select plant growth regulators to produce desired	

CT Plant Science Standards 9-12	Connecticut State Standards English Language Arts
responses from plants.	
CT-PS.02.01. Performance Indicator: Determine the influence of environmental factors on plant growth.	
Level 1	
CT-PS.02.01.01.a. Describe the effects air, temperature and water have on plant metabolism and growth.	RST.9-10.10; RST11-12.10; RST.9-10.7; RST.11-12.7; WHST.9-10.7; WHST.9-10.8, WHST9-10.9; WHST.11-12.7; WHST.11-12.8, WHST.11-12.9
Level 2	
CT-PS.02.01.01.b. Determine the optimal air, temperature and water conditions for plant growth.	RST.9-10.10; RST11-12.10; RST.9-10.9; RST.11-12.9
Level 3	
CT-PS.02.01.01.c. Design, implement and evaluate a plan to maintain optimal conditions for plant growth.	
CT-PS.02.02. Performance Indicator: Evaluate soil/media and prepare soil/growth media for use in plant systems.	
Level 1	
CT-PS.02.02.01.a. Identify the major components of soil/growing media and describe how growing media support plant growth.	RST.9-10.10; RST11-12.10; RST.9-10.9; RST.11-12.9
CT-PS.02.02.02.a. Identify the differences between clay, sand and silt soils.	RST.9-10.10; RST11-12.10; RST.9-10.4; RST.11-12.4
CT-PS.02.02.03a. Describe the influence of soil (including growing media), water and other environmental factors on horticultural plant growth (A3).*	RST.9-10.10; RST11-12.10; RST.9-10.1; RST.9-10.5, RST.9-10.9; RST.11-12.1; RST.11-12.5, RST.11-12.9
Level 2	
CT-PS.02.02.01.b. Describe the physical characteristics of soil/growing media and explain the influence they have on plant growth.	RST.9-10.10; RST11-12.10; RST.9-10.1; RST.9-10.5, RST.9-10.9; RST.11-12.1; RST.11-12.5, RST.11-12.9
CT-PS.02.02.02.b. Describe how soil texture affects drainage and plant growth.	RST.9-10.10; RST11-12.10; RST.9-10.1; RST.9-10.5, RST.9-10.9; RST.11-12.1; RST.11-12.5, RST.11-12.9
Level 3	
CT-PS.02.02.01.c. Select, formulate and prepare soil/growing media for specific plants or crops.	
CT-PS.02.02.02.c. Determine soil texture and make necessary modifications to maximize plant growth.	
CT-PS.02.03. Performance Indicator: Develop and implement a fertilization plan for specific plants or crops.	
Level 1	
CT-PS.02.03.01.a. Identify the essential nutrients for plant growth and development and their major functions.	RST.9-10.10; RST11-12.10; RST.9-10.1; RST.11-12.1
CT-PS.02.03.02.a. Describe pH and its effect on plant growth.	RST.9-10.10; RST11-12.10; RST.9-10.1; RST.11-12.1; RST.9-10.5; RST.11-12.5;
CT-PS.02.03.03.a. Collect soil samples for testing and interpret test results.	
CT-PS.02.03.04.a. Identify Fertilizer sources, formulations and the	RST.9-10.10; RST11-12.10

CT Plant Science Standards 9-12	Connecticut State Standards English Language Arts
various methods of fertilizer application.	
CT-PS.02.03.05.a. Compare fertilizer types/sources.	RST.9-10.10; RST11-12.10; WHST.9-10.7; WHST.9-10.8; WHST.9-10.9; WHST.11-12.7; WHST.11-12.8; WHST.11-12.9
Level 2	
CT-PS.02.03.01.b. Describe nutrient deficiency symptoms and recognize environmental causes of nutrient deficiencies.	RST.9-10.10; RST11-12.10; RST.9-10.5; RST.11-12.5
CT-PS.02.03.02.b. Explain the influence of pH and cation exchange capacity on the availability of nutrients.	RST.9-10.10; RST11-12.10; RST.9-10.5; RST.11-12.5
CT-PS.02.03.03.b. Determine the nutrient content of soil using appropriate laboratory procedures.	RST.9-10.10; RST11-12.10; RST.9-10.3; RST.11-12.3
CT-PS.02.03.04.b. Compare efficiency and effectiveness of different fertilizer formulas and application methods.	RST.9-10.3; RST.11-12.3; WHST.9-10.7; WHST.9-10.8; WHST.9-10.9; WHST.11-12.7; WHST.11-12.8; WHST.11-12.9
CT-PS.02.03.05.b. Compare costs and potential environmental impact of fertilizer types.	RST.9-10.10; RST11-12.10; WHST.9-10.1
Level 3	
CT-PS.02.03.01.c. Monitor plants for signs of nutrient deficiencies and prepare a scouting report.	
CT-PS.02.03.02.c. Adjust the pH of growing media.	
CT-PS.02.03.03.c. Analyze results of soil tests to develop a nutrient management plan.	
CT-PS.02.03.04.c. Calculate fertilizer rates calibrate and operate equipment needed to meet crop nutrient needs.	
CT-PS.02.03.05.c. Evaluate cost/benefits of fertilization plans.	
CT-PS.03.01. Performance Indicator: Demonstrate plant propagation techniques.	
Level 1	
CT-PS.03.01.01.a. Explain sexual and asexual propagation.	RST.9-10.10; RST11-12.10
CT-PS.03.01.02.a. Describe types of seed and explain proper seed storage.	RST.9-10.10; RST11-12.10
CT-PS.03.01.03.a. Identify methods and optimal conditions for asexual propagation.	RST.9-10.10; RST11-12.10
CT-PS.03.01.04.a. Define micro propagation and explain its use in horticultural production.	RST.9-10.10; RST11-12.10
Level 2	
CT-PS.03.01.01.b. Diagram the parts of the flower and the process of process of plant fertilization.	
CT-PS.03.01.02.b. Demonstrate sowing techniques and favorable conditions for seed germination.	
CT-PS.03.01.03.b. Demonstrate proper techniques used to propagate plants by cuttings, division, separation, layering, budding and grafting.	RST.9-10.10; RST11-12.10
CT-PS.03.01.04.b. Explain the advantages of micro propagation and the potential for problems with this method.	WHST.9-10.4; WHST.11-12.4; WHST.9-10.7; WHST.9-10.8; WHST.9-10.9; WHST.11-12.7; WHST.11-12.8; WHST.11-12.9; RST.9-10.1; RST.11-12.1
Level 3	

CT Plant Science Standards 9-12	Connecticut State Standards English Language Arts
CT-PS.03.01.01.c. Explain plant life cycles, sexual propagation, and the advantages and disadvantages of hybrid plants (A4).*	
CT-PS.03.01.02.c. Evaluate and adjust germination conditions, monitor for common disorders during germination.	
CT-PS.03.01.03.c. Evaluate asexual propagation practices based on productivity and efficiency.	
CT-PS.03.01.04.c. Describe optimal conditions for asexual propagation and demonstrate an understanding of techniques used in asexual plant propagation and plant micro-propagation (A5).*	
PS.03.01.05.c. Evaluate the performance of genetically modified crops.	
PS.03.02. Performance Indicator: Develop and implement a plant management plan for crop production.	
Level 1	
CT-PS.03.02.01.a. Demonstrate proper planting procedures and post-planting care.	
CT-PS.03.02.02.a. Demonstrate appropriate cultural practices for crops.	
CT-PS.03.02.03.a. Identify factors that influence water holding capacity and drainage in soil/growing media.	RST.9-10.10; RST.11-12.10
CT-PS.03.02.04.a. Identify examples of crops where the production schedule is influenced by market demand.	RST.9-10.10; RST.11-12.10
CT-PS.03.02.05.a. Identify advantages and disadvantages of plant growing structures and specific crop growing areas.	RST.9-10.10; RST.11-12.10; WHST.9-10.9; WHST.11-12.9
CT-PS.03.02.05a. Demonstrate knowledge of plant maintenance practices for interior plants and landscaping including Integrated Pest Management (I.P.M.) (A8).*	RST.9-10.10; RST.11-12.10
Level 2	
CT-PS.03.02.01.b. Select and demonstrate appropriate planting procedures and post-planting care techniques.	RST.9-10.10; RST.11-12.10
CT-PS.03.02.02.b. Observe and record the effects of environmental conditions and cultural practices on crops.	RST.9-10.10; RST.11-12.10; RST.9-10.3; WHST.9-10.7
CT-PS.03.02.03.b. Compare and contrast irrigation and water conservation methods.	RST.9-10.10; RST.11-12.10
CT-PS.03.02.04.b. Develop a crop schedule for various horticulture crops based on desired market delivery date.	RST.9-10.10; RST.11-12.10; RST.9-10.9; RST.11-12.9
CT-PS.03.02.05.b. Demonstrate knowledge of greenhouse structures and environmental controls (A9).*	RST.9-10.10; RST.11-12.10
Level 3	
CT-PS.03.02.01.c. Evaluate the effectiveness of various pre-plant treatments and post planting procedures for crops.	
CT-PS.03.02.02.c. Design a management plan, monitor crop progress and make adjustments as necessary to maximize production.	
CT-PS.03.02.03.c. Design and evaluate irrigation systems for plant production.	
CT-PS.03.02.04.c. Implement and evaluate the effectiveness of alternative crop schedules for a specific horticultural crop.	
CT-PS.03.02.05.c. Design the layout of the planting area to maximize the use of growing space and produce quality crops.	
CT-PS.03.03. Performance Indicator: Develop and implement a plan for integrated pest management.	
Level 1	
CT-PS.03.03.01.a. Identify types of plant pests and disorders.	RST.9-10.10; RST.11-12.10

CT Plant Science Standards 9-12	Connecticut State Standards English Language Arts
CT-PS.03.03.02.a. Describe damage caused by plant pests and diseases.	RST.9-10.10; RST.11-12.10
CT-PS.03.03.03.a. Define integrated pest management.	
CT-PS.03.03.04.a. Explain risks and benefits associated with the materials and methods used in plant pest management.	RST.9-10.1; RST.11-12.1
Level 2	
CT-PS.03.03.01.b. Identify major local weeds, insect pests and infectious and noninfectious plant diseases.	
CT-PS.03.03.02.b. Diagram the life cycles of major plant pests and diseases.	
CT-PS.03.03.03.b. Describe integrated pest management strategies.	RST.9-10.1; RST.11-12.1
CT-PS.03.03.04.b. Explain procedures for the safe handling, use and storage of pesticides.	RST.9-10.1; RST.11-12.1
Level 3	
CT-PS.03.03.01.c. Design and implement a crop scouting program.	
CT-PS.03.03.02.c. Predict pest and disease problems based on environmental conditions and life cycles.	
CT-PS.03.03.03.c. Develop and implement a plant management plan for greenhouse production including Integrated Pest Management (I.P.M.) (A6).*	
CT-PS.03.03.04.c. Evaluate environmental and consumer concerns regarding pest management strategies.	
CT-PS.03.04. Performance Indicator: Apply principles and practices of various plant production methods to meet the needs of the market.	
Level 1	
CT-PS.03.04.01.a. Explain sustainable agriculture and objectives associated with the strategy.	RST.9-10.10; RST.11-12.10; RST.9-10.1; RST.11-12.1
CT-PS.03.04.02.a. Compare methods of production including the social/marketing aspects of organic farming, sustainable agriculture, and genetic engineering in plant science (A7).*	WHST.9-10.7; WHST.9-10.8; WHST.9-10.9; WHST.11-12.7; WHST.11-12.8; WHST.11-12.9; WHST.9-10.6; WHST.11-12.6; WHST.9-10.1; WHST.11-12.1; RST.9-10.1; RST.9-10.7; RST.9-10.8, RST.9-10.9; RST.11-12.1; RST.11-12.7; RST.11-12.8, RST.11-12.9
CT-PS.03.04.03.a. Identify types of crops that can be produced and marketed in a specified 'local' area.	RST.9-10.10; RST.11-12.10
Level 2	
CT-PS.03.04.01.b. Describe sustainable agriculture practices and compares the ecological effects of traditional agricultural practices with those of sustainable agriculture.	WHST.9-10.7; WHST.9-10.8; WHST.9-10.9; WHST.11-12.7; WHST.11-12.8; WHST.11-12.9; WHST.9-10.6; WHST.11-12.6; WHST.9-10.1; WHST.11-12.1; RST.9-10.1; RST.9-10.7; RST.9-10.8, RST.9-10.9; RST.11-12.1; RST.11-12.7; RST.11-12.8, RST.11-12.9
CT-PS.03.04.02.b. Determine the 'marketability' of sustainable and/or organic methods of production.	RST.9-10.10; RST.11-12.10
CT-PS.03.04.03.b. Determine the 'marketability' of locally grown products.	RST.9-10.10; RST.11-12.10
Level 3	

CT Plant Science Standards 9-12	Connecticut State Standards English Language Arts
CT-PS.03.04.01.c. Prepare and implement a plan for an agricultural enterprise that involves practices in support of sustainable agriculture.	
CT-PS.03.04.02.c. Evaluate environmental effects and consumer attitudes regarding different production strategies.	
CT-PS.03.03.02.c. Evaluate cost/benefits of locally grown and marketed products.	
CT-PS.04.01. Performance Indicator: Create designs using plants.	
Level 1	
CT-PS.04.01.01.a. Apply artistic principles in both floral and landscape design (A10).*	RST.9-10.10; RST.11-12.10
CT-PS.04.01.02.a. Discuss the applications of art in agriculture/horticulture.	RST.9-10.10; RST.11-12.10
CT-PS.04.01.03.a. Describe the factors that influence the conditioning and vase life of cut flowers, greens and decorative plants.	RST.9-10.10; RST.11-12.10; RST.9-10.3; RST.11-12.3
CT-PS.04.01.04.a. Identify and select common forms and types of flowers and foliage's used in the floriculture industry.	
CT-PS.04.01.05.a. Identify common tools and supplies used in the floral industry.	
CT-PS.04.01.06.a. Identify factors that influence pricing, scheduling and marketing of a floriculture product or crop.	RST.9-10.10; RST.11-12.10; RST.9-10.1; RST.11-12.1
Level 2	
CT-PS.04.01.01.b. Explain how the elements and principles of design influence the visual effect, the shape and the purpose of specific designs.	RST.9-10.10; RST.11-12.10; WHST.9-10.9; WHST.11-12.9
CT-PS.04.01.02.b. Discuss principles of design that form the basis of artistic impression.	RST.9-10.10; RST.11-12.10
CT-PS.04.01.03.b. Demonstrate appropriate conditioning and storage of cut flowers.	RST.9-10.10; RST.11-12.10
CT-PS.04.01.04.b. Order the correct quantity of flowers and foliage to create a floral piece.	
CT-PS.04.01.05.b. Select and safely use tools, supplies and equipment common in the floral industry.	
CT-PS.04.01.06.b. Assess the scheduling, pricing and marketing effectiveness of a floriculture product or crop.	RST.9-10.10; RST.11-12.10
Level 3	
CT-PS.04.01.01.c. Select plants, hard goods, supplies and other materials for use in a design based on a range of criteria.	
CT-PS.04.01.02.c. Evaluate and create designs by following established principles of art.	
CT-PS.04.01.03.c. Evaluate the effects of proper care and handling of cut flowers greens and decorative plants.	
CT-PS.04.01.04.c. Evaluate the use and positioning of flowers and foliage in a floral piece.	
CT-PS.04.01.05.c. Evaluate tools and supplies available in lab/shop and order supplies based on needs of the lab.	
CT-PS.04.01.06.c. Create a production plan for a floriculture product or crop that considers scheduling pricing and marketing.	
CT-PS.04.02 Performance Indicator: Determine supplies needed to create landscape designs and develop a marketing plan.	
Level 1	
CT-PS.04.02.01.a. Identify the uses and the selection criteria of landscape plants and hardscape materials for a Connecticut landscape plan.	RST.9-10.10; RST.11-12.10

CT Plant Science Standards 9-12	Connecticut State Standards English Language Arts
CT-PS.04.02.02.a. Identify techniques, tools and technology used in landscape drawings (A11).*	
CT-PS.04.02.03.a. Identify common plant and hardscape landscape symbols.	
CT-PS.04.02.04.a. Define the principles of landscape design.	RST.9-10.10; RST.11-12.10
CT-PS.04.02.05.a. Identify factors that influence pricing and marketing of landscape estimate.	RST.9-10.10; RST.11-12.10; RST.9-10.9; RST.11-12.9
CT-PS.04.02.06.a. Identify factors that should be considered for turf grass installation, establishment, maintenance and management.	RST.9-10.10; RST.11-12.10; RST.9-10.1; RST.11-12.1
CT-PS.04.02.07.a. Identify factors that influence pricing, scheduling and marketing of a floriculture product or crop.	RST.9-10.10; RST.11-12.10; RST.9-10.1; RST.11-12.1; RST.9-10.9; RST.11-12.9
CT-PS.04.02.07.c Demonstrate knowledge of skills needed in the floral design industry (A12).*	RST.9-10.10; RST.11-12.10
Level 2	
CT-PS.04.02.01.b. Evaluate the landscape plants and hardscape design selected to meet the needs of a specific landscape plan.	RST.9-10.10; RST.11-12.10
CT-PS.04.02.02.b. Select and safely use tools, supplies and equipment in the landscape industry.	
CT-PS.04.02.03.b. Create a landscape drawing using an architect/engineer scale and related drawing tools.	
CT-PS.04.02.04.b. Evaluate a landscape and explain the impact of the design principles.	RST.9-10.10; RST.11-12.10; WHST.9-10.4
CT-PS.04.02.05.b. Assess the pricing and marketing effectiveness of a landscape estimate.	RST.9-10.10; RST.11-12.10
CT-PS.04.02.06.b. Develop a plan to successfully install or establish and maintain turf grass.	RST.9-10.10; RST.11-12.10; WHST.9-10.9; WHST.11-12.9
CT-PS.04.02.07.b. Assess the scheduling, pricing and marketing effectiveness of a floriculture product or crop.	RST.9-10.10; RST.11-12.10; RST.9-10.1; RST.9-10.7; RST.9-10.9; RST.11-12.1; RST.11-12.7; RST.11-12.9;
Level 3	
CT-PS.04.02.01.c. Create a landscape plan that utilizes proper landscape plants and hardscapes to meet the needs of a client's landscape plan.	
CT-PS.04.02.02.c. Evaluate supplies and equipment available in lab/business and order equipment and supplies based on needs of the lab/business.	
CT-PS.04.02.03.c. Create a landscape drawing using a variety of artistic methods.	
CT-PS.04.02.04.c. Create a landscape proposal that implements the principles of design.	
CT-PS.04.02.05.c. Create a business plan and estimate for a landscape proposal that considers scheduling, pricing and marketing.	
CT-PS.04.02.06.c. Demonstrate skills and knowledge used in turf grass installation, establishment, maintenance and management.	
CT-PS.04.02.07.c. Create a production plan for a floriculture product or crop that considers scheduling pricing and marketing.	

Power Structural and Technical Systems (Agriculture Mechanics)

CT Power Structural and Technical Systems Standards 9-12	Connecticut State Standards English Language Arts
CT-PST.01.0. Performance Indicator: Apply physical science laws and principles to identify, classify and use lubricants.	
Level 1	
CT-PST.01.01.01.a. Classify lubricants by source, sustainability and equipment compatibility.	RST 9-10.3
Level 2	
CT-PST.01.01.01.b. Classify lubricants by SAE viscosity and API service classifications.	RST 11-12.3
Level 3	
PST.01.02.01.c. Select, use and dispose of lubricants according to local, state and federal regulations.	
CT-PST.01.02. Performance Indicator: Identify and use hand and power tools and equipment for service, construction and fabrication.	
Level 1	
CT-PST.01.02.01.a. Identify and explain the appropriate use of tools used in agriculture mechanics (A6).*	RST 9-10.3, SL 9-10.4
CT-PST.01.02.02.a. Select appropriate tools and materials to construct wood structures related to agriculture. (A1).*	WHST 9-10.9
Level 2	
CT-PST.01.02.01.b. Maintain and repair tools used in agriculture mechanics (A7).*	WHST 11-12.9
Level 3	
CT-PST.01.02.01.c. Assess the performance of self and/or peers in use of hand and power tools to safely and efficiently service, construct and fabricate quality products.	
CT-PST.02.01. Performance Indicator: Perform service routines to maintain power units and equipment.	
Level 1	
CT-PST.02.01.01.a. Identify and schedule power unit and equipment lubrication.	WHST 9-10.9
Level 2	
CT-PST.02.01.01.b. Ensure the presence and function of safety systems and hardware on tools and equipment.	WHST 11-12.9
Level 3	
CT-PST.02.01.01.c. Test and service electrical systems.	
CT-PST.02.02. Performance Indicator: Operate, service and diagnose the condition of power units and equipment.	
Level 1	
CT-PST.02.02.01.a. Operate and maintain agricultural machinery and power systems (A8).*	WHST 9-10.9
CT-PST.02.02.02.a. Perform pre-operation inspection according to manufacturers' specifications and/or prevailing industry standards.	WHST 9-10.9
Level 2	
CT-PST.02.02.01.b. Use operator/service/technical manuals utilized in agriculture mechanics (A4).*	WHST 11-12.9
CT-PST.02.02.02.b. Explain the safe operation of agricultural tractors and related agricultural equipment (A5).*	SL 11-12.4

CT Power Structural and Technical Systems Standards 9-12	Connecticut State Standards English Language Arts
Level 3	
CT_PST.02.02.01.c. Select power units and equipment for operational efficiencies.	
CT-PST.02.02.02.c. Adjust equipment for safe and efficient operation.	
CT-PST.03.01. Performance Indicator: Troubleshoot and repair internal combustion engines.	
Level 1	
CT-PST.03.01.01.a. Identify components and systems of internal combustion engines.	WHST 9-10.9
CT-PST.03.01.02.a. Describe the operation of internal combustion engines by types of fuel used.	SL 9-10.4
Level 2	
CT_PST.03.01.01.b. Utilize technical manuals and computer-based diagnostics in engine analysis and repair.	WHST 11-12.9
CT-PST.03.01.02.b. Analyze and troubleshoot internal combustion engines.	WHST 11-12.9
Level 3	
CT-PST.03.01.01.c. Performance test internal combustion engines to determine service and repair needs.	
CT-PST.03.01.02.c. Overhaul spark-and-compression internal combustion engines.	
CT-PST.03.02. Performance Indicator: Service and repair power transmission systems of agricultural equipment.	
Level 1	
CT-PST.03.02.01.a. Identify and describe applications of simple machines in power systems.	WHST 9-10.9, SL 9-10.4
CT-PST.03.02.02.a. Calculate mechanical advantage in mechanical systems.	
CT-PST.03.02.03.a. Identify power transfer principles, including those using friction, gears and fluids.	WHST 9-10.9
Level 2	
CT-PST.03.02.01.b. Identify and compare operation principles and features, benefits and applications of various power transmission systems.	WHST 11-12.9
CT-PST.03.02.02.b. Describe features, benefits and applications of mechanical transmission components, including belts, chains, gears, bearings, seals, universals and drive shafts.	SL 11-12.4
CT-PST.03.02.03.b. Inspect, analyze and repair clutches and brakes.	WHST 11-12.9
Level 3	
CT-PST.03.02.01.c. Use speed, torque and power measurements to improve efficiency in power transmission systems.	
CT-PST.03.02.02.c. Inspect, analyze and repair hydrostatic transmissions.	
CT-PST.03.02.03.c. Inspect, analyze and repair differentials, final drives, transmissions (including gear-type and power-shift transmissions) and auxiliary drives.	
CT-PST.03.03. Performance Indicator: Service and repair hydraulic and pneumatic systems.	
Level 1	
CT-PST.03.03.01.a. Describe features, benefits and applications of common types of hydraulic and pneumatic systems.	SL 9-10.4
CT-PST.03.03.02.a. Apply hydrostatic and hydrodynamic principles in	SL 9-10.4

CT Power Structural and Technical Systems Standards 9-12	Connecticut State Standards English Language Arts
hydraulics and pneumatics, including Archimedes' principle and Pascal's law.	
CT-PST.03.03.03.a. Evaluate hydraulic and pneumatic system functionality.	WHST 9-10.9
CT-PST.03.03.04.a. Describe the meaning and use of sensors, controllers and actuators.	SL 9-10.4
Level 2	
CT-PST.03.03.01.b. Describe principles of hydraulic and pneumatic system operation.	SL 11-12.4
CT-PST.03.03.02.b. Identify major components of hydraulic and pneumatic systems and describe their use.	WHST 11-12.9
CT-PST.03.03.03.b. Identify hydraulic and pneumatic system fittings and ports.	WHST 11-12.9
CT-PST.03.03.04.b. Identify sensor, control, and actuator system components on power units and equipment.	WHST 11-12.9
Level 3	
CT-PST.03.03.01.c. Utilize symbols and schematic drawings in the maintenance of hydraulic and pneumatic systems.	
CT-PST.03.03.02.c. Inspect, analyze and repair hydraulic and pneumatic system components, including fluid and compressed-air conveyance components.	
CT-PST.03.03.03.c. Use a pressure-and-flow tester in diagnosing malfunctions and repairing hydraulic and pneumatic systems.	
CT-PST.03.03.04.c. Diagnose malfunctions and repair control systems and sensors, including those of engines, transmissions and implements.	
CT- PST.03.04. Performance Indicator: Install maintains and troubleshoots agricultural electrical systems.	
Level 1	
CT-PST.03.04.01.a. Apply the meaning and measurement of electricity, including amperage, voltage and wattage.	RST 9-10.4
CT-PST.03.04.02.a. Identify the kinds and applications of electricity, including direct and alternating current.	WHST 9-10.9
CT-PST.03.04.03.a. Identify electricity measurements and make measurement calculations.	WHST 9-10.9
CT-PST.03.04.04.a. Discuss various types and sources of electricity including renewable and sustainable sources.	SL 9-10.4
CT-PST.03.04.05.a. Recognize common electrical symbols.	RST 9-10.4
CT-PST.03.04.06.a. Identify uses of electrical sensors and controls.	WHST 9-10.9
CT-PST.03.04.07.a. Identify hazards and safety practices in planning, installing and using electricity.	WHST 9-10.9
Level 2	
CT-PST.03.04.01.b. Assess and install electrical circuits, including conductors, insulators and controls.	WHST 11-2.9
CT-PST.03.04.02.b. Interpret electrical system symbols and diagrams.	RST 11-12.4
CT-PST.03.04.03.b. Distinguish electrical circuits and components of each.	RST 11-12.4
CT-PST.03.04.04.b. Use volt and amp meters and continuity testers to demonstrate electricity principles.	WHST 11-12.9
CT-PST.03.04.05.b. Read and design schematic drawings for an electrical control system.	RST 11-12.4
CT-PST.03.04.06.b. Interpret maintenance schedules for electrical control	WHST 11-12.9

CT Power Structural and Technical Systems Standards 9-12	Connecticut State Standards English Language Arts
systems.	
CT-PST.04.03.07.b. Distinguish and select materials and tools used in electrical control circuit installation.	RST 11-12.4
Level 3	
CT-PST.03.04.01.c. Evaluate power unit and equipment electrical systems, including ignition, lighting, auxiliary and electronic braking.	
CT-PST.03.04.02.c. Assess and repair malfunctioning electrical systems and components, such as battery, lighting, instrumentation and accessories.	
CT-PST.03.04.03.c. Install and/or repair electrical wiring components and fixtures following appropriate codes and standards.	
CT-PST.03.04.04.c. Locate and use electrical codes and regulations.	
CT-PST.03.04.05.c. Identify and use electrical control system components, including transistors, relays, HVAC and logic controllers.	
CT-PST.03.04.06.c. Troubleshoot electrical control system performance problems.	
CT-PST.04.03.07.c. Plan and install electrical control circuits to assure proper operation.	

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Agricultural Structures

CT Electricity, Electrical Motors & Controls Standards 9-12	Connecticut State Standards English Language Arts
CT-PST.04.01. Performance Indicator: Create sketches and plans of agricultural structures.	
Level 1	
CT-PST.04.01.01.a. Identify symbols and drawing techniques used to develop plans and sketches.	RST 9-10.4
CT-PST.04.01.02.a. Prepare bills of materials to accompany plans and sketches.	WHST 9-10.4, WHST 9-10.6
Level 2	
CT-PST.04.01.01.b. Develop plans and sketches using drafting equipment and computer programs.	
CT-PST.04.01.02.b. Use scale measurement and dimension to develop plans and sketches.	
Level 3	
CT-PST.04.01.01.c. Apply principles of design, fabrication and installation of agricultural structures.	
CT-PST.04.01.02.c. Design functional and efficient facilities for agricultural use.	
CT-PST.04.02. Performance Indicator: Apply structural plans, specifications and building codes.	
Level 1	
CT-PST.04.02.01.a. Understand agricultural plans/drawings and measure accurately (A12).*	WHST 9-10.9
CT-PST.04.02.02.a. Identify the sources and importance of industry construction and materials standards, including those of the American National Standards Institute (ANSI) and Underwriters' Laboratories (UL).	RST 9-10.1
CT-PST.04.02.03.a. Identify design and construction recommendations and practices in agricultural structures.	WHST 9-10.9
CT-PST.04.02.04a. Explain wiring of basic agricultural structures (A9).*	SL 9-10.4
Level 2	
CT-PST.04.02.01.b. Identify and interpret different views of a construction drawing.	WHST 11-12.9, RST 11-12.4
CT-PST.04.02.02.b. Identify local code enforcement agencies and procedures.	WHST 11-12.9
CT-PST.04.02.03.b. Read and interpret local structural code information.	WHST 11-12.9, RST 11-12.4
Level 3	
CT-PST.04.02.01.c. Locate, explain and apply elements of a construction drawing.	
CT-PST.04.02.02.c. Follow local construction and safety codes and specifications in agricultural construction.	
CT-PST.04.02.03.c. Complete appropriate local permit applications for a construction project.	
CT-PST.04.03. Performance Indicator: Examine structural requirements for materials and procedures and estimate construction cost.	
Level 1	
CT-PST.04.03.01.a. Identify criteria in selecting materials in agricultural construction/fabrication.	WHST 9-10.9

CT Electricity, Electrical Motors & Controls Standards 9-12	Connecticut State Standards English Language Arts
CT-PST.04.03.02.a. Explain the importance and use of requests for construction bids.	SL 9-10.4
Level 2	
CT-PST.04.03.01.b. Select types of materials; determine quantities and estimate their costs and other costs associated with a specified project plan.	WHST 9-10.9
CT-PST.04.03.02.b. Establish business relationships with vendors of materials and services used in agricultural construction.	SL 11-12.4
Level 3	
CT-PST.04.03.01.c. Prepare a project cost estimate, including materials, labor and management.	
CT-PST.04.03.02.c. Prepare a bid package for a planned construction project, including construction timelines, site evaluation, construction plans and related management factors.	
CT-PST.04.04. Performance Indicator: Follow architectural and mechanical plans to construct and/or repair equipment, buildings and facilities.	
Level 1	
CT-PST.04.04.01.a. Plan, build and maintain agricultural structures (A11).*	
CT-PST.04.04.02.a. Calculate areas and volumes for coatings.	
CT-PST.04.04.03.a. Measure and calculate materials for concrete, brick, stone or masonry units in agricultural construction.	
Level 2	
CT-PST.04.04.01.b. Understand plumbing systems related to agricultural production (A10).*	
CT-PST.04.04.02.b. Paint or protect with coatings.	
CT-PST.04.04.03.b. Explain building and repair of concrete and masonry structures related to agriculture (A3).*	
Level 3	
CT-PST.04.04.01.c. Evaluate work products or samples for quality and efficiency of workmanship following architectural and mechanical plans.	
CT-PST.04.04.02.c. Electroplate or otherwise coat materials.	
CT-PST.04.04.03.c. Seal, pigment and otherwise prepare concrete, brick, stone or masonry unit surfaces.	
Welding Standards 9-12	Connecticut State Standards English Language Arts
CT-PST.05.01. Performance Indicator: Follow architectural and mechanical plans to construct and/or repair equipment, buildings and facilities.	
Level 1	
PST.05.01.01.a. Identify kinds and characteristics of metal materials.	WHST 9-10.9
Level 2	
CT-PST.05.01.01.b. Compare welding (arc, oxyacetylene and M.I.G.) techniques used in agriculture mechanics (A2).*	
Level 3	
CT-PST.05.01.01.c. Construct and/or repair metal structures and equipment using welding fabrication procedures, including those associated with SMAW, GMAW, GTAW, fuel-oxygen and plasma arc torch methods.	

