

# Vermont Career Technical Education (CTE) Program Critical Proficiencies

## Diversified Agriculture CTE Programs

The Critical Proficiencies identify the essential knowledge, skills, and abilities that VT CTE students need to demonstrate (1) to be program completers, and (2) to be prepared for future learning. Critical proficiencies promote high expectations for all students, and support students' personal, professional, and academic development. At the high school level, VT's Proficiency-Based Graduation Requirements (PBGRs) reflect the critical proficiencies that lead to postsecondary career and college readiness.

There are 17 unique program areas which categorize VT's CTE programs. Each of the 17 program-area templates includes:

- Program-Area Descriptions
- Career Ready Practices
- Career Cluster(s) and Pathway(s)
- Anchor Standards
- Program Technical Standards
- Academic Alignment
- CTE Program Elements

### Advance CTE Common Career Technical Core - Career Ready Practices

The Common Career Technical Core (CCTC) is a state-led initiative to establish a set of rigorous, high-quality standards for Career Technical Education (CTE). The CCTC includes a set of standards for each Career Cluster® and corresponding Career Pathways that define what students should know and be able to do after completing instruction in a program of study. The CCTC also includes an overarching set of Career Ready Practices that apply to all programs of study. The Career Ready Practices include statements that address the knowledge, skills, and dispositions that are important to becoming career ready.

The Career Ready Practices were developed from a state-led initiative sponsored by the National Association of State Directors of Career Technical Education Consortium (NASDCTEC).

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline, or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study. (NASDCTEC, 2012)

## The Career Ready Practices

- are applicable across all program areas.
- align with the VT Transferable Skills Proficiency-Based Graduation Requirements (PBGRs) and VT Portrait of a Graduate.
- are the *transferable skills* of the Common Career Technical Core and the *portrait* of a VT CTE program completer.

## Advance CTE Common Career Technical Core - Career Cluster and Pathway Standards

The Common Career Technical Core is divided into Career Cluster and Pathway standards. Each Career Cluster contains one or more pathways with pathway-specific technical standards. The template shows which CCTC Career Cluster and Pathway standards are relevant to VT CTE programs.

## Anchor Standards

The Anchor Standards build upon the Career Ready Practices and show the overarching standards categories which are common across all technical programs within their Career Cluster(s) and Pathway(s). The VT CTE Anchor Standards are derived from and align with the CCTC Anchor Standards.

## Program Technical Standards

The Program Technical Standards build on and continue the Anchor Standards with more complexity, rigor, and career specificity. Knowledge and skills are learned and applied within a standards-based CTE program that integrates classroom, laboratory, and work-based instruction. The VT CTE Program Technical Standards are tailored to the unique characteristics and structure of each of the 17 program areas.

## Academic Alignment

Each program-area template includes academic alignment with the VT Content-Area Sample Graduation Proficiencies as part of VT's Proficiency-Based Graduation Requirements (PBGRs). These include Common Core State Standards in English Language Arts and Mathematics, Next Generation Science Standards, as well as other adopted national and state academic standards.

## CTE Critical Proficiency Template

<b>Critical Proficiency Template:</b>	Attributes:
<b>Program-Area Descriptions</b>	17 Program Areas
<b>Common Career Technical Core - Career Ready Practices</b>	<ol style="list-style-type: none"> <li>1. Act as a responsible and contributing citizen and employee.</li> <li>2. Apply appropriate academic and technical skills.</li> <li>3. Attend to personal health and financial well-being.</li> <li>4. Communicate clearly and effectively and with reason.</li> <li>5. Consider the environmental, social, and economic impacts of decisions.</li> <li>6. Demonstrate creativity and innovation.</li> <li>7. Employ valid and reliable research strategies.</li> <li>8. Utilize critical thinking to make sense of problems and persevere in solving them.</li> <li>9. Model integrity, ethical leadership, and effective management.</li> <li>10. Plan education and career paths aligned to personal goals.</li> <li>11. Use technology to enhance productivity.</li> <li>12. Work productively in teams while using cultural global competence.</li> </ol>
<b>Common Career Technical Core - Career Cluster(s) and Pathway(s)</b>	Relevant to VT's 17 CTE Program Areas
<b>Anchor Standards</b>	<ol style="list-style-type: none"> <li>1. Academics</li> <li>2. Communication</li> <li>3. Problem Solving and Critical Thinking</li> <li>4. Technology</li> <li>5. Systems (Responsibility and Flexibility)</li> <li>6. Health and Safety</li> <li>7. Leadership and Teamwork</li> <li>8. Ethics and Legal Responsibilities</li> <li>9. Career Planning and Management</li> <li>10. Technical Knowledge and Skills (see Program Technical Standards)</li> <li>11. Demonstration and Application (see CTE Program Elements)</li> </ol>
<b>Program Technical Standards</b>	Build on the Anchor Standards with more complexity, rigor, and career specificity
<b>Academic Alignment</b>	With VT Content-Area Graduation Proficiencies

<b>Critical Proficiency Template:</b>	Attributes:
<b>CTE Program Elements</b>	Demonstration and application: <ul style="list-style-type: none"> <li>● Dual Enrollment/Fast Forward Courses</li> <li>● Industry Recognized Credentials (IRCs)</li> <li>● Work-Based Learning/Co-op/Apprenticeship</li> <li>● National Career Technical Student Organizations</li> <li>● Entrepreneurship</li> <li>● Portfolio/Personalized Learning Plan</li> </ul>

**VT Diversified Agriculture CTE Programs**

Students in **Diversified Agriculture** programs have in-depth, hands-on experiences related to a range of agricultural career paths in agriscience, agricultural business, plant and soil science, animal science, agricultural mechanics, and horticulture.

The standards in this program area are designed to prepare students for technical training, postsecondary education, and/or entry-level employment in the field of diversified agriculture. Students engage in an instructional program that integrates academic and technical preparation, career exploration, and preparation for postsecondary education and/or training. Knowledge and skills are learned and applied within a standards-based CTE program that integrates classroom, laboratory, and work-based instruction.

**Advance CTE Common Career Technical Core - Career Ready Practices**

<b>Advance CTE Common Career Technical Core - Career Ready Practices:</b>	Aligned with <a href="#">VT Transferable Skills</a> Proficiency-Based Graduation Requirements (PBGRs) and <a href="#">VT Portrait of a Graduate</a>
<b>1. Act as a responsible and contributing citizen and employee.</b>	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community, and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.

<p><b>Advance CTE Common Career Technical Core - Career Ready Practices:</b></p>	<p>Aligned with <a href="#">VT Transferable Skills</a> Proficiency-Based Graduation Requirements (PBGRs) and <a href="#">VT Portrait of a Graduate</a></p>
<p><b>2. Apply appropriate academic and technical skills.</b></p>	<p>Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.</p>
<p><b>3. Attend to personal health and financial well-being.</b></p>	<p>Career-ready individuals understand the relationship between personal health, workplace performance, and personal well-being; they act on that understanding to regularly practice healthy diet, exercise, and mental health activities. Career-ready individuals also take regular action to contribute to their personal financial wellbeing, understanding that personal financial security provides the peace of mind required to contribute more fully to their own career success.</p>
<p><b>4. Communicate clearly and effectively and with reason.</b></p>	<p>Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.</p>
<p><b>5. Consider the environmental, social, and economic impacts of decisions.</b></p>	<p>Career-ready individuals understand the interrelated nature of their actions and regularly make decisions that positively impact and/or mitigate negative impact on other people, organization, and the environment. They are aware of and utilize new technologies, understandings, procedures, materials, and regulations affecting the nature of their work as it relates to the impact on the social condition, the environment, and the profitability of the organization.</p>

<p><b>Advance CTE Common Career Technical Core - Career Ready Practices:</b></p>	<p>Aligned with <a href="#">VT Transferable Skills</a> Proficiency-Based Graduation Requirements (PBGRs) and <a href="#">VT Portrait of a Graduate</a></p>
<p><b>6. Demonstrate creativity and innovation.</b></p>	<p>Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.</p>
<p><b>7. Employ valid and reliable research strategies.</b></p>	<p>Career-ready individuals are discerning in accepting and using new information to make decisions, change practices, or inform strategies. They use reliable research processes to search for new information. They evaluate the validity of sources when considering the use and adoption of external information or practices in their workplace situation.</p>
<p><b>8. Utilize critical thinking to make sense of problems and persevere in solving them.</b></p>	<p>Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.</p>
<p><b>9. Model integrity, ethical leadership, and effective management.</b></p>	<p>Career-ready individuals consistently act in ways that align personal and community-held ideals and principles while employing strategies to positively influence others in the workplace. They have a clear understanding of integrity and act on this understanding in every decision. They use a variety of means to positively impact the directions and actions of a team or organization, and they apply insights into human behavior to change others' actions, attitudes, and/or beliefs. They recognize the near-term and long-term effects that management's actions and attitudes can have on productivity, morals, and organizational culture.</p>

<p><b>Advance CTE Common Career Technical Core - Career Ready Practices:</b></p>	<p>Aligned with <a href="#">VT Transferable Skills</a> Proficiency-Based Graduation Requirements (PBGRs) and <a href="#">VT Portrait of a Graduate</a></p>
<p><b>10. Plan education and career paths aligned to personal goals.</b></p>	<p>Career-ready individuals take personal ownership of their own education and career goals, and they regularly act on a plan to attain these goals. They understand their own career interests, preferences, goals, and requirements. They have perspective regarding the pathways available to them and the time, effort, experience, and other requirements to pursue each, including a path of entrepreneurship. They recognize the value of each step in the education and experiential process, and they recognize that nearly all career paths require ongoing education and experience. They seek counselors, mentors, and other experts to assist in the planning and execution of career and personal goals.</p>
<p><b>11. Use technology to enhance productivity.</b></p>	<p>Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks - personal and organizational - of technology applications, and they take actions to prevent or mitigate these risks.</p>
<p><b>12. Work productively in teams while using cultural global competence.</b></p>	<p>Career-ready individuals positively contribute to every team, whether formal or informal. They apply an awareness of cultural differences to avoid barriers to productive and positive interaction. They find ways to increase the engagement and contribution of all team members. They plan and facilitate effective team meetings.</p>

**Advance CTE Common Career Technical Core - [Agriculture, Food, and Natural Resources](#) Career Cluster and Pathway Standards**

<p><b>The following Career Cluster and Pathway standards are relevant to VT Diversified Agriculture CTE programs:</b></p>	<p>This Career Cluster® is focused on the production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products or resources.</p>
<p><b>Agriculture, Food, and Natural Resources Career Cluster</b></p>	<ol style="list-style-type: none"> <li>1. Analyze how issues, trends, technologies, and public policies impact systems in the Agriculture, Food &amp; Natural Resources Career Cluster.</li> <li>2. Evaluate the nature and scope of the Agriculture, Food &amp; Natural Resources Career Cluster and the role of agriculture, food, and natural resources (AFNR) in society and the economy.</li> <li>3. Examine and summarize the importance of health, safety, and environmental management systems in AFNR businesses.</li> <li>4. Demonstrate stewardship of natural resources in AFNR activities.</li> <li>5. Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food &amp; Natural Resources Career Pathways.</li> <li>6. Analyze the interaction among AFNR systems in the production, processing and management of food, fiber, and fuel and the sustainable use of natural resources.</li> </ol>
<p><b>Agribusiness Systems Pathway</b></p>	<ol style="list-style-type: none"> <li>1. Apply management planning principles in AFNR businesses.</li> <li>2. Use record keeping to accomplish AFNR business objectives, manage budgets, and comply with laws and regulations.</li> <li>3. Manage cash budgets, credit budgets, and credit for an AFNR business using generally accepted accounting principles.</li> <li>4. Develop a business plan for an AFNR business.</li> <li>5. Use sales and marketing principles to accomplish AFNR business objectives.</li> </ol>

<p><b>The following Career Cluster and Pathway standards are relevant to VT Diversified Agriculture CTE programs:</b></p>	<p>This Career Cluster® is focused on the production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products or resources.</p>
<p><b>Animal Systems Pathway</b></p>	<ol style="list-style-type: none"> <li>1. Analyze historic and current trends impacting the animal systems industry.</li> <li>2. Utilize best-practice protocols based upon animal behaviors for animal husbandry and welfare.</li> <li>3. Apply principles of animal reproduction to achieve desired outcomes for performance, development and/or economic production.</li> <li>4. Evaluate environmental factors affecting animal performance and implement procedures for enhancing performance and animal health.</li> <li>5. Classify, evaluate, and select animals based on anatomical and physiological characteristics.</li> <li>6. Apply principles of effective animal health care.</li> </ol>
<p><b>Food Products and Processing Systems Pathway</b></p>	<ol style="list-style-type: none"> <li>1. Develop and implement procedures to ensure safety, sanitation, and quality in food product and processing facilities.</li> <li>2. Apply principles of nutrition, biology, microbiology, chemistry, and human behavior to the development of food products.</li> <li>3. Select and process food products for storage, distribution, and consumption.</li> <li>4. Explain the scope of the food industry and the historical and current developments of food products and processing.</li> </ol>
<p><b>Plant Systems Pathway</b></p>	<ol style="list-style-type: none"> <li>1. Develop and implement a crop management plan for a given production goal that accounts for environmental factors.</li> <li>2. Apply the principles of classification, plant anatomy, and plant physiology to plant production and management.</li> <li>3. Propagate, culture, and harvest plants and plant products based on current industry standards.</li> <li>4. Apply principles of design in plant systems to enhance an environment (e.g., floral, forest, landscape and farm).</li> </ol>

<p><b>The following Career Cluster and Pathway standards are relevant to VT Diversified Agriculture CTE programs:</b></p>	<p>This Career Cluster® is focused on the production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products or resources.</p>
<p><b>Power, Structural &amp; Technical Systems Pathway</b></p>	<p>1. Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology to facilitate work within the power, structural and technical systems.</p>

### VT CTE Program Anchor Standards

<p><b>Anchor Standards:</b></p>	<p>Aligned with Advance CTE Common Career Technical Core - Career Cluster Anchor Standards</p>
<p><b>1. Academics</b></p>	<p>Achieve additional academic knowledge and skills required to pursue the full-range of career and postsecondary education opportunities.</p>
<p><b>2. Communication</b></p>	<p>Acquire and accurately use terminology and information at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.</p>
<p><b>3. Problem Solving and Critical Thinking</b></p>	<p>Conduct short, as well as more sustained, research to create alternative solutions to answer a question or solve a problem using critical and creative thinking; logical reasoning, analysis, inquiry, and problem-solving techniques.</p>
<p><b>4. Technology</b></p>	<p>Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the workplace environment.</p>
<p><b>5. Systems (Responsibility and Flexibility)</b></p>	<p>Initiate, and participate in, a range of collaborations to demonstrate behaviors that reflect personal and professional responsibility, flexibility, and respect in the workplace environment and community settings.</p>
<p><b>6. Health and Safety</b></p>	<p>Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the workplace environment.</p>

<b>Anchor Standards:</b>	Aligned with Advance CTE Common Career Technical Core - Career Cluster Anchor Standards
<b>7. Leadership and Teamwork</b>	Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution.
<b>8. Ethics and Legal Responsibilities</b>	Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.
<b>9. Career Planning and Management</b>	Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.
<b>10. Technical Knowledge and Skills</b> (see Program Technical Standards)	Apply essential technical knowledge and skills common to the Career Cluster and Pathway(s), following procedures when carrying out experiments and/or performing technical tasks.
<b>11. Demonstration and Application</b> (see CTE Program Elements)	Demonstrate and apply technical knowledge and skills across a variety of CTE-specific opportunities in classroom, laboratory, and workplace settings.

## VT Diversified Agriculture CTE Program Technical Standards

<b>Program Technical Standards:</b>	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>Agriscience Pathway</b>  <b>1. Academic and Technical Foundations</b>	<ul style="list-style-type: none"> <li>a. Identify and safely utilize agricultural tools, equipment, and machinery.</li> <li>b. Identify and use personal safety protocols and hazardous materials procedures.</li> <li>c. Evaluate the role of agriculture in the Vermont economy.</li> <li>d. Describe the impact of agriculture on Vermont water resources.</li> <li>e. Examine the interrelationship between agriculture and the environment.</li> <li>f. Explore the roles of animals in modern agriculture.</li> <li>g. Describe the structure and function of plants, animals, bacteria, and viruses.</li> <li>h. Explore animal anatomy and systems.</li> <li>i. Explain the concepts of basic plant and animal genetics.</li> <li>j. Explain fundamental animal nutrition and feeding.</li> <li>k. Summarize soil science principles.</li> <li>l. Describe fundamental pest management concepts.</li> </ul>
<b>2. Problem Solving and Critical Thinking</b>	<ul style="list-style-type: none"> <li>a. Analyze the effects of technology on agriculture.</li> <li>b. Evaluate basic animal health principles.</li> <li>c. Analyze plant growth and development concepts.</li> <li>d. Design agricultural experiments using the scientific method.</li> </ul>
<b>3. Communication</b>	<ul style="list-style-type: none"> <li>a. Demonstrate effective verbal and written communication skills in the agriscience classroom, lab, and workplace.</li> </ul>
<b>4. Leadership and Teamwork</b>	<ul style="list-style-type: none"> <li>a. Demonstrate an ability to work independently and as a collaborative agriscience team member.</li> </ul>
<b>5. Ethics and Legal Responsibilities</b>	<ul style="list-style-type: none"> <li>a. Recognize the professional and ethical standards that are required in the field of agriscience.</li> </ul>
<b>6. Career Development</b>	<ul style="list-style-type: none"> <li>a. Identify and explore career options and pathways in the field of agriscience, and research required training and certification processes.</li> </ul>

<b>Program Technical Standards:</b>	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>Agricultural Business Pathway</b>  <b>1. Academic and Technical Foundations</b>	<ul style="list-style-type: none"> <li>a. Identify and safely utilize agricultural tools, equipment, and machinery.</li> <li>b. Identify and use personal safety protocols and hazardous materials procedures.</li> <li>c. Manage machinery, equipment, and labor.</li> <li>d. Explore decision-making processes within the free enterprise system and apply to agricultural business.</li> <li>e. Explain the fundamental economic principles of agribusiness and agricultural production.</li> <li>f. Explore the role of credit in agribusiness and agricultural production.</li> <li>g. Summarize agricultural business accounting principles and procedures to accomplish fiscal management and tax planning.</li> <li>h. Recognize the role and value of agricultural organizations.</li> <li>i. Explain the principles of agricultural marketing systems.</li> <li>j. Describe the sales process of agricultural products and services.</li> </ul>
<b>2. Problem Solving and Critical Thinking</b>	<ul style="list-style-type: none"> <li>a. Evaluate how to manage business risk and uncertainty.</li> <li>b. Differentiate among local and national agricultural markets and communicate how trade affects the economy.</li> <li>c. Manage a small woodlot.</li> </ul>
<b>3. Communication</b>	<ul style="list-style-type: none"> <li>a. Demonstrate effective verbal and written communication skills in the agricultural business classroom, lab, and workplace.</li> </ul>
<b>4. Leadership and Teamwork</b>	<ul style="list-style-type: none"> <li>a. Demonstrate an ability to work independently and as a collaborative team member in the agricultural business field.</li> </ul>
<b>5. Ethics and Legal Responsibilities</b>	<ul style="list-style-type: none"> <li>a. Recognize the professional and ethical standards that are required in agricultural business.</li> </ul>

<b>Program Technical Standards:</b>	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>6. Career Development</b>	<ul style="list-style-type: none"> <li>a. Identify and explore agricultural business career options and pathways, and research required training and certification processes.</li> </ul>
<b>Animal Science Pathway</b>  <b>1. Academic and Technical Foundations</b>	<ul style="list-style-type: none"> <li>a. Identify and safely utilize tools, equipment, and machinery.</li> <li>b. Identify and use personal safety protocols and hazardous materials procedures.</li> <li>c. Explain the necessary elements for proper animal housing and animal-handling equipment.</li> <li>d. Connect and apply the principles of animal nutrition to ensure the proper growth, development, reproduction, and economic production of animals</li> <li>e. Define principles of comparative anatomy and physiology to use within various animal systems.</li> <li>f. Describe animal reproduction, including the function of reproductive organs.</li> <li>g. Explain animal inheritance and selection principles, including the structure and role of DNA.</li> <li>h. Recognize the challenges associated with animal waste management.</li> <li>i. Describe the production of large animals (e.g., cattle, horses, swine, sheep, goats) and small animals (e.g., poultry, cavy, rabbits).</li> <li>j. Explain how animal products and by-products are processed and marketed.</li> </ul>
<b>2. Problem Solving and Critical Thinking</b>	<ul style="list-style-type: none"> <li>a. Prescribe a prevention treatment program for animal diseases, parasites, and other disorders.</li> <li>b. Assess animal welfare concerns and management practices that support animal welfare.</li> <li>c. Explore common pasture and rangeland management practices and their impact on a balanced ecosystem.</li> </ul>
<b>3. Communication</b>	<ul style="list-style-type: none"> <li>a. Demonstrate effective verbal and written communication skills in the animal science classroom, lab, and workplace.</li> </ul>

<b>Program Technical Standards:</b>	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>4. Leadership and Teamwork</b>	a. Demonstrate an ability to work independently and as a collaborative team member in the field of animal science.
<b>5. Ethics and Legal Responsibilities</b>	a. Recognize the professional and ethical standards that are required in animal science.
<b>6. Career Development</b>	a. Identify and explore animal science career options and pathways, and research required training and certification processes.
<b>Plant and Soil Science Pathway</b> <b>1. Academic and Technical Foundations</b>	<ul style="list-style-type: none"> <li>a. Identify and safely utilize tools, equipment, and machinery.</li> <li>b. Identify and use personal safety protocols and hazardous materials procedures.</li> <li>c. Summarize plant classification principles.</li> <li>d. Describe the concepts of cell biology.</li> <li>e. Explain plant physiology and growth principles.</li> <li>f. Explain sexual and asexual reproduction of plants.</li> <li>g. Interpret the role of nutrients and soils in plant production.</li> <li>h. Identify and appraise effective irrigation and water management practices.</li> <li>i. Explain the concept of an “agrosystem” approach to production.</li> <li>j. Compare and contrast local crop management and production practices.</li> <li>k. Explain and demonstrate scientific principles and techniques in plant science.</li> </ul>
<b>2. Problem Solving and Critical Thinking</b>	<ul style="list-style-type: none"> <li>a. Assess pest problems and management concepts.</li> <li>b. Evaluate effective tillage and soil conservation management practices.</li> </ul>
<b>3. Communication</b>	a. Demonstrate effective verbal and written communication skills in the diversified agriculture classroom, laboratory, and workplace.
<b>4. Leadership and Teamwork</b>	a. Demonstrate an ability to work independently and as a collaborative team member in the field of plant and soil science.

<b>Program Technical Standards:</b>	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>5. Ethics and Legal Responsibilities</b>	a. Recognize the professional and ethical standards that are required in the field of plant and soil science.
<b>6. Career Development</b>	a. Identify and explore plant and soil science career options and pathways, and research required training and certification processes.
<b>Agricultural Mechanics Pathway</b>  <b>1. Academic and Technical Foundations</b>	a. Identify and safely utilize agricultural tools, equipment, and machinery. b. Identify and use personal safety protocols and hazardous materials procedures. c. Explain and demonstrate the principles of basic woodworking. d. Summarize basic electricity principles and demonstrate wiring practices commonly used in agriculture. e. Select and apply plumbing system practices commonly used in agriculture. f. Explain concrete and masonry practices commonly used in agriculture. g. Describe basic metallurgy principles, including cold metal processes. h. Develop and apply fabrication techniques, metal cutting, and welding processes such as oxy-fuel, stick and/or MIG welding. i. Explain the components of small and compact engines. j. Articulate the principles and applications of various engines and machinery used in agriculture. k. Explain and demonstrate land measurement and construction techniques commonly used in agriculture.
<b>2. Problem Solving and Critical Thinking</b>	a. Apply the basic concepts of biological systems, land treatment, soil science, and agricultural technology systems to agricultural mechanics.
<b>3. Communication</b>	a. Demonstrate effective verbal and written communication skills in the agricultural mechanics classroom, lab, and workplace.

<b>Program Technical Standards:</b>	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>4. Leadership and Teamwork</b>	a. Demonstrate an ability to work independently and as a collaborative team member in agricultural mechanics.
<b>5. Ethics and Legal Responsibilities</b>	a. Recognize the professional and ethical standards that are required in the field of agricultural mechanics.
<b>6. Career Development</b>	a. Identify and explore agricultural mechanics career options and pathways, and research required training and certification processes.
<b>Horticulture Pathway</b> <b>1. Academic and Technical Foundations</b>	<ul style="list-style-type: none"> <li>a. Identify and safely utilize horticultural tools, equipment, and machinery.</li> <li>b. Identify and use personal safety protocols and hazardous materials procedures.</li> <li>c. Summarize plant physiology and growth principles.</li> <li>d. Explain and demonstrate plant propagation techniques.</li> <li>e. Describe water and soil management practices.</li> <li>f. Explain ornamental plant nutrition practices.</li> <li>g. Explain and demonstrate the selection, installation, and maintenance of turf.</li> <li>h. Summarize nursery production principles.</li> <li>i. Identify and demonstrate the proper use of containers and horticultural tools, equipment, and facilities.</li> <li>j. Explain and demonstrate basic landscape planning, design, construction, and maintenance.</li> <li>k. Describe and illustrate basic floral design principles.</li> </ul>
<b>2. Problem Solving and Critical Thinking</b>	<ul style="list-style-type: none"> <li>a. Compare and contrast the hierarchical classification of plants.</li> <li>b. Develop and implement a plan for basic integrated pest management.</li> </ul>
<b>3. Communication</b>	a. Demonstrate effective verbal and written communication skills in the horticulture classroom, lab, and workplace.
<b>4. Leadership and Teamwork</b>	a. Demonstrate an ability to work independently and as a collaborative team member in horticulture.

<b>Program Technical Standards:</b>	Standards for each career path build on and continue the Anchor Standards with more complexity, rigor, and career specificity.
<b>5. Ethics and Legal Responsibilities</b>	a. Recognize the professional and ethical standards that are required in the field of horticulture.
<b>6. Career Development</b>	a. Identify and explore career options and pathways in horticulture, and research required training and certification processes.

**VT Diversified Agriculture CTE Program - Academic Alignment with [VT Content Area Graduation Proficiencies \(PBGRs\)](#)**

<b>Graduation Proficiencies:</b>	<b>Indicators:</b>
<a href="#">English Language Arts</a>	High School 1. <b>Reading:</b> b, c, d, g 2. <b>Writing:</b> a, b, d, e 3. <b>Writing:</b> c 4. <b>Speaking and Listening:</b> a, b, d 5. <b>Speaking and Listening:</b> a, b, d 6. <b>Language:</b> a, c, e
<a href="#">Mathematics</a>	High School 1. <b>Modeling:</b> a, b, d, e, f 2. <b>Number and Quantity:</b> c 6. <b>Statistics and Probability:</b> a, e
<a href="#">Science</a>	High School 3. <b>Life Sciences:</b> Structure, Function, and Information Processing: b, c, d, e, g 4. <b>Life Sciences:</b> Matter and Energy in Organisms and Ecosystems: a, b, d, e, f, g 5. <b>Life Sciences:</b> Growth, Development, and Reproduction of Organisms, Natural Selection, and Adaptations: a, b, c, f, g 7. <b>Earth and Space Sciences:</b> Earth Systems: b, e, i, k 8. <b>Engineering, Technology, and Application of Science:</b> a, b, c, e

<b>Graduation Proficiencies:</b>	<b>Indicators:</b>
<a href="#"><u>Global Citizenship/Social Studies</u></a>	End of Gr. 12 <b>Inquiry:</b> Constructing compelling and supporting questions: a, d; Determining helpful sources: a <b>Civics:</b> Civic and Political Institutions: a; Processes, Rules, and Laws: a <b>Economics:</b> Economic Decision Making: a; Exchange and Markets: a <b>Geography:</b> Human Environment Interaction: Place, Regions, and Culture: a <b>Communicating Conclusions and Taking Informed Action:</b> Communicating: b
<a href="#"><u>Physical Education</u></a>	High School 1. <b>Knowledge and Motor Skills:</b> a 3. <b>Physical Fitness:</b> b 4. <b>Affective Qualities and Social Interaction:</b> b, d

### VT Diversified Agriculture CTE Program Elements

<b>Demonstration and Application:</b>	Available Options:
<b>Dual Enrollment/Fast Forward Courses</b>	<b>VTC:</b> Agriculture Techniques I (AGR 1011), Livestock Production (AGR 1050), Intro to Horticulture (LAH 1020)
<b>Industry Recognized Credentials (IRCs)</b>	<b>Tier 1:</b> Tree Climbing for Arborists, OSHA-10, First Aid/CPR/AED, Conover Workplace Readiness, GIS GPS Level 1, ServSafe Food Handler  <b>Tier 2:</b> NSTMO, PA-WP, UVM Water Rescue, NCRC Gold, Platinum (level 5 & up)
<b>National Career Technical Student Organizations (CTSOs)</b>	Future Farmers of America (FFA) SkillsUSA
<b>Work-Based Learning/Co-op (WBL)</b>	Varies by CTE Center
<b>Entrepreneurship Opportunities</b>	Varies by CTE Center
<b>Portfolio/Personalized Learning Plan (PLP)</b>	Varies by CTE Center