

**Agricultural and
Environmental Systems
Career Field**

**Agriculture, Food and
Natural Resources**

Subject Code 010105

Meredith Wolf-Oregon City Schools

David Stacklin-Penta Career Center



Rigorous Assessment Items Aligned to the Four Depth of Knowledge Levels for Ohio CT Courses in

Agricultural and Environmental Systems

Construction Technologies

Human Services

Health Science

Transportation Systems

Sponsored by Northwest Ohio Tech Prep, Northwest Ohio HSTW, The University of Toledo CTE Teacher Prep Program, and Ohio ACTE



Teachers and administrators from five schools throughout Northwest Ohio engaged in a three day workshop focusing on the creation of rigorous assessment items aligned to the four Depth of Knowledge (DOK) Levels as defined by Ohio's Career Field Technical Content Standards for at least one course in their career field. Rigorous assessment items were developed to assist teachers in the creation of student assessments aligned to the state standards, thus ensuring an increase in student performance on the correlating WebXams.

Schools engaged in the initiative:

Penta Career Center, Perrysburg, Ohio

Christina Kerns, Supervisor of Curriculum and Instruction, Workshop Facilitator
Nicole Costello, Small Animal Care Teacher
Eric Eisel, Auto Collision Teacher
Tracy Graf, Hair Design Teacher
Shelley Rogers, Medical Technologies Teacher
David Stacklin, Agriculture Teacher
Phil Stockwell, Supervisor of Agriculture and Transportation
Jason Vida, Construction Carpentry Teacher

Oregon City Schools, Oregon, Ohio

Steve Bialorucki, Director, Career & Technology Education
Jodi Eckman, Cosmetology Teacher
Meredith Wolfe, Agriculture Teacher

Sylvania City Schools, Sylvania, Ohio

Holly Fair, Cosmetology Teacher
Julie Sanford, Secondary/CTE Assistant Director
Bryan Smith, Ag Business Teacher

Toledo Public Schools, Toledo, Ohio

Bryan Ellis, Urban Agriculture Teacher
Steve Oswanski, Small Animal Management Teacher

Washington Local Schools, Toledo, Ohio

Kimberlee Farnham, Cosmetology Teacher
Leslie Fish, Cosmetology Teacher
Phil Kraus, Construction Carpentry Technology Teacher
Deb Heban, Director, Career & Technical Education

Post-Secondary Support:

Kathleen Crates, The University of Findlay
Paul Hubaker, Northwest Ohio Tech Prep
Eric Landversicht, The University of Toledo
Kathy Wilson, Northwest Ohio Tech Prep



Courses Aligned to the Four DOK Levels:

Agricultural and Environmental Systems Career Field

1. **Agriculture, Food and Natural Resources 010105** (A0, A1, A2, A3, A5, and A6 Pathways)
David Stacklin, Penta Career Center, Agriculture Teacher and Meredith Wolfe, Oregon City Schools, Agriculture Teacher
2. **Greenhouse & Nursery Management 010610** (A0 and A5 Pathways)
Bryan Ellis, Toledo Public Schools, Urban Agriculture Teacher and Bryan Smith, Sylvania City Schools, Ag Business Teacher
3. **Zoo and Aquarium 010940** (A2 Pathway)
Nicole Costello, Penta Career Center, Small Animal Care Teacher and Steve Oswanski, Toledo Public Schools, Small Animal Management Teacher

Construction Technologies Career Field

1. **Structural Coverings and Finishes 178004** (Structural Systems DD Pathway)
Phil Kraus, Washington Local Schools, Construction Carpentry Technology Teacher and Jason Vida, Penta Career Center, Construction Carpentry Teacher

Human Services Career Field

1. **Advanced Hair Cutting and Styling 174130** (Cosmetology M1 Pathway)
Tracy Graf, Penta Career Center, Hair Design Teacher, Kimberlee Farnham, Washington Local Schools, Cosmetology Teacher, and Steve Bialorucki, Oregon City Schools, Director, Career & Technology Education
2. **Advanced Chemical Services 174140** (Cosmetology M1 Pathway)
Tracy Graf, Penta Career Center, Hair Design Teacher, Kimberlee Farnham, Washington Local Schools, Cosmetology Teacher, and Steve Bialorucki, Oregon City Schools, Director, Career & Technology Education
3. **Microbiology and Infection Control 174115** (Cosmetology M1 Pathway)
Jodi Eckman, Oregon City Schools, Cosmetology Teacher, Holly Fair, Sylvania City Schools, Cosmetology Teacher and Leslie Fish, Washington Local Schools, Cosmetology Teacher

Health Science Career Field

1. **Patient Centered Care 072050** (Allied Health and Nursing JM Pathway)
Deb Heban, Washington Local Schools, Director, Career & Technical Education and Shelley Rogers, Penta Career Center, Medical Technologies Teacher

Transportation Systems Career Field

1. **Collision Painting & Refinishing 177012** (Ground Transportation T9 Pathway)
Eric Eisel, Penta Career Center, Auto Collision Teacher and Phil Stockwell, Penta Career Center, Supervisor of Agriculture and Transportation

Course Specific Descriptors for Each DOK Level
Agriculture Programs
Agriculture, Food and Natural Resources
Subject Code: 010105

Course Description

This first course in the career field is an Introduction to Agricultural and Environmental Systems. Students will be introduced to the scope of the Agricultural and Environmental Systems career field. They will examine principles of food science, natural resource management, animal science and management, plant and horticultural science, power technology, and bioscience. Students will examine the FFA organization and Supervised Agricultural Experience programs. Throughout the course, students will develop communication, leadership, and business skills essential to the agriculture industry.

DOK Level 1

Students will identify basic tools and terminology used in the Agricultural field; learn general safety procedures; explain a wide variety of careers; and develop basic skills in public speaking.

DOK Level 2

Students will apply and explain concepts in Agriculture; work efficiently with tools and materials; understand animal species and their use in Agriculture; and compare renewable and alternative energy.

DOK Level 3

Students will analyze business, financial, and agricultural specific documents. Increased emphasis is given to decision making skills, evaluating a variety of situations, and selecting best practices. Students develop a career direction, value life structures, and organization. They learn to adapt, draw conclusions, and network while team building. Students continuously build relationships, investigate data to cite evidence, communicate opinions on animals, plants and biotechnology.

DOK Level 4

Students at DOK Level 4 become professional leaders who enhance the abilities of everyone around them as an extension of their own lives. Higher-level demonstration and implementation of concepts allow these students to acknowledge the complex nature of Agriculture. Students create feasible solutions to local and world problems and actively seek out leadership roles to be part of the future of Agriculture.

Agriculture, Food and Natural Resources
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Unit: Production Agriculture & Agribusiness

Students will be introduced to the vast operations and opportunities within the Food, Fiber and Natural Resources Industries. They will explore general agricultural topics such as, top grossing commodities, career opportunities within the agribusiness field, as well as terminology essential to the understanding of the agricultural world.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.3. Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options.	Question: What might you include in a career plan?	Activity: Identify and summarize steps you might take to pursue an identified career interest and explain how your high school courses align to your plan.	Activity: Given three career options, evaluate which career you would pursue at this time and provide rationale. Make sure to include supporting evidence.	Project: Investigate a professional in your community with the same/similar career field as your interest. Conduct an interview and describe how this career impacts the world and local community.
DOK 2	1.1.4. Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships.	Question: Define what a professional organization is, as well as its role and function.	Activity: Compare and contrast two different professional organizations of your interest. Present the information to the class using a visual device of your choice.	Project: Survey members of professional organizations. Inquire about their involvement, and industry association benefits. Be sure to include networking techniques and relationship building aspects.	Project: Design a professional organization of your own that you find a need for in a career field of your interest. What would its purpose be? Who would be members? Etc. Create a brochure to share with the class.

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LEVEL 3 Outcome 1.8.

Operations Management: Plan, organize, and monitor an organization or department to maximize contribution to organizational goals and objectives.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.8.3. Analyze the performance of organizational activities and reallocate resources to achieve established goals.	Activity: Describe your FFA chapters Program of Activity (POA) for the year, then chart participation and funds spent on activities.	Activity: Calculate and create a graphic organizer for the percentage of funds spent on each activity.	Activity: Draw a conclusion as to which activity was most effective in the use of funds and which was the least effective. How would you use this information as an officer planning next year's POA?	Project: Develop a POA that reflects your findings about the effectiveness of programs from previous years.

LEVEL 2 Outcome 1.11.

Principles of Business Economics: Examine and employ economic principles, concepts, and policies to accomplish organizational goals and objectives.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.11.1. Identify the economic principles that guide geographic location of an industry's facilities (e.g., relative scarcity, price, quantity of products, and services).	Question: Define economic principles, such as relative scarcity, price, quantity of products and services.	Question: Explain the relationship between a business' location and its success or failure.	Activity: How would a business test the notion that a business' location is going to be successful? Evaluate and provide rationale.	Project: Develop an expansion plan for a local, regional, and multi-national companies to present to each respective board. See rubric.

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Unit: Sustainable Agriculture

This unit asks the question, what is sustainable agriculture? Students will learn which basic practices will allow the sustainability of life through one's own efforts in producing agricultural products in various climates and atmospheres.

LEVEL 3 Outcome 1.8.

Operations Management: Plan, organize, and monitor an organization or department to maximize contribution to organizational goals and objectives.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 3	1.8.2. Select and organize resources to develop a product or a service.	Question: Define the term "product" or "service." Give examples of each.	Question: Brainstorm examples of agricultural products and services. Categorize using common terminology into a graphic organizer.	Activity: Investigate and report on quality testing methods for a new or revamped product or service.	Project: Create your own new sustainable product and evaluate its feasibility using a research driven testing method.
DOK 2	1.8.9. Develop a budget that reflects the strategies and goals of the organization.	Question: Describe your FFA chapters' strategies and goals.	Activity: Create a graphic organizer showing the percentage of funds spent on each strategy or goal.	Activity: Adapt your budget to reflect the strategies and goals, highlight/label changes.	Project: Analyze multiple local and statewide CTSO budgets. Reflect your findings about the effectiveness of your program in a product.

LEVEL 2 Outcome 1.11.

Principles of Business Economics: Examine and employ economic principles, concepts and policies to accomplish organizational goals and objectives.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.11.1. Identify the economic principles that guide geographic location of an industry's facilities (e.g., relative scarcity, price, quantity of products, and services).	Question: Define economic principles such as, relative scarcity, price, quantity of products, and services.	Question: Explain the relationship between a business' location and their success or failure.	Activity: Evaluate and provide supporting details for business' test that a business' location is going to be successful.	Project: Develop an expansion plan for local, regional, and multi-national companies to present to each respective board. See rubric.

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LEVEL 2 Outcome 9.1.

Energy Sources: Identify energy sources according to their economic viability, sustainability, and environmental impact.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	9.1.2. Identify, compare and contrast renewable energy sources and the technology used to generate energy.	Question: How would you describe renewable energy? Make a list of renewable energy sources.	Activity: Compare and contrast five different sources of renewable energy using a graphic organizer. See rubric.	Activity: Select a renewable energy source you would use or determine is the best option. Cite evidence supporting what makes that renewable energy superior to the others?	Project: Develop a persuasive argument on a renewable energy policy in your state or United States and why it is behind other parts of the world (states) and recommend changes.
DOK 1	9.1.4. Identify the social, economic, and environmental drivers and barriers that influence the development and use of energy sources.	Question: List the social, economic, and environmental drivers and barriers that influence the development and use of energy sources.	Question: How would you explain the development location and use of energy production facilities in the United States?	Activity: Produce ideas to adapt the energy production industry in the United States to meet the world's standards on social, economic, and environmental factors.	

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Unit: Industrial Technology & Safety

Students will explore engineering and structural principles utilized in the agriculture industry and the coordinating career opportunities. Topics could include an overview of estimating and building, fundamental principles of metal working and engine repair. Safety will be an essential underlying theme in all fields explored.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.3. Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options.	Question: What might you include in a career plan?	Activity: Identify and summarize steps you might take to pursue an identified career interest and explain how your high school courses align to your plan.	Activity: Given three career options, evaluate which career you would pursue at this time and provide rationale. Make sure to include supporting evidence.	Project: Investigate a professional in your community with the same/similar career field as your interest. Conduct an interview and describe how this career impacts the world and local community.
DOK 2	1.1.4. Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships.	Question: Define what a professional organization is, as well as its role and function.	Activity: Compare and contrast two different professional organizations of your interest. Present the information to the class using a visual device of your choice.	Project: Survey members of professional organizations. Inquire about their involvement, and industry association benefits. Be sure to include networking techniques and relationship building aspects.	Project: Design a professional organization of your own that you find a need for in a career field of your interest. What would its purpose be? Who would be members? Etc. Create a brochure to share with the class.

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LEVEL 2 Outcome 1.12.

Site and Personal Safety Procedures: Follow site and personal safety procedures in specific situations with specialized tools and equipment, evaluate the situation and take corrective action.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.12.1 Use Occupational Safety and Health Administration (OSHA) defined procedures for identifying employer and employee responsibilities, working in confined spaces, managing worker safety programs, using ground fault circuit interrupters (gfcis), maintaining clearance and boundaries, and labeling.	Question: What is OSHA and its purpose in the industry?	Activity: Summarize the regulations (GFIs, clearances, boundaries, labeling, etc.) that OSHA has applied in the workplace and how you can personally use them in our lab.	Project: Research OSHA violations and cite evidence. Develop a logical argument for using OSHA procedures and regulations in the industry.	
DOK 1	1.12.2. Interpret safety signs and symbols.	Question: ♦ Interpret safety signs and symbols. ♦ Match signs with symbols/ definition.	Activity: Given safety signs and symbols, create a graphic organizer based on common categories.	Project: Throughout your school and lab, investigate safety symbols and signs. Report any recommendations for improvement.	
DOK 1	1.12.5. Identify the location of emergency flush showers, eyewash fountains, Safety Data Sheets (SDSS), fire alarms, and exits.	Activity: Identify the location of emergency flush showers, eyewash fountains, Safety Data Sheets (SDSS), fire alarms, and exits.	Activity: Draw a map and specify the locations of safety equipment in our lab. Include eye wash station, MSDS, fire alarms, etc., and describe the procedure for use.	Activity: Given a provided scenario, explain what safety equipment you would use, its location, and how and what you would do in the situation.	

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DOK 1	1.12.6. Identify procedures for the handling, storage, and disposal of hazardous materials.	Question: List examples of hazardous materials and proper disposal methods.	Question: What steps are needed to properly handle, store, and dispose of hazardous materials?		
DOK 2	1.12.7. Select, use, store, maintain, and dispose of personal protective equipment (PPE), appropriate to job tasks, conditions, and materials.	Question: What is PPE? Who determines appropriate PPE for a job?	Activity: Produce a graphic organizer to assist students in determining which PPE is required for the different lab activities (Welding, woodworking, etc.).	Activity: Given a provided scenario, describe which PPE is required and how you would use, store, maintain, and dispose of selected PPE.	
DOK 2	1.12.8. Identify safety hazards and take corrective measures.	Activity: List common safety hazards in an Ag Mechanics lab.	Project: Develop a PowerPoint that identifies common safety hazards with recommended corrective measures on the following slide.	Activity: Critique and assist in revision of classmates PowerPoint that identifies common safety hazards with recommended corrective measures on the following slide.	
DOK 2	1.12.9. Identify, inspect and use safety equipment appropriate for the task.	Question: What are examples of appropriate safety equipment?	Activity: Predict possible equipment failures for common agricultural tasks.	Activity: Given a provided scenario, select proper safety equipment for task and describe the appropriate use.	
DOK 2	1.12.10. Follow established procedures for the administration of first aid and contact emergency medical personnel when necessary.	Question: List the emergency procedures for first aid and emergencies.	Activity: Given a provided scenario, describe how to follow established procedures for first aid and emergency contact.	Project: Produce a video of an individual responding to a lab accident. Critique their response and provide evidence.	

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LEVEL 2 Outcome 4.1.

Tool, Stationary and Mobile Equipment Maintenance: Inspect, clean, maintain, and perform planned preventative maintenance on tools, machinery, implements and equipment.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 1	4.1.1. Identify the types of hand tools, power tools, and stationary equipment and describe their functions.	Question: Match types of hand tools, power tools, and stationary equipment with their name or functions.	Question: ♦ What tools are needed for (scenario)? ♦ What tools are not needed? ♦ Categorize the tools.		

LEVEL 2 Outcome 4.3.

Engines: Apply concepts to service components of both small and large internal combustion engines.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	4.3.5. Compare and contrast two-cycle and four-cycle engines and their operating principles.	Question: Name the operating principles of two- and four-cycle engines.	Activity: Compare and contrast two-cycle and four-cycle engines and their operating principles.	Project: Create a graphic organizer for the recommended best use for two-cycle and four-cycle engine applications.	

LEVEL 2 Outcome 5.3.

Design and Estimate: Plan and design a basic site plan for a desired outcome.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	5.3.1. Identify, interpret and use symbols, lines, dimensions, views, sections, site plans, floor plans, specifications, common scales, detail drawings, and abbreviations on drawings and prints.	Question: Label or match symbols used in construction drawings.	Question: Explain the relationship between a drawing and its corresponding installation.	Project: Construct a construction plan using symbols, lines, dimensions, etc.	

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DOK 2	5.3.2. Apply proportional reasoning and indirect measurement techniques.	Question: Identify tools used to take indirect measurements.	Activity: Obtain indirect measurements of the trees on campus using a biltmore stick.	Project: Produce a product to inform industry professionals on proper use of chosen indirect measuring technique.	
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LEVEL 2 Outcome 5.6.

Construction: Follow architectural plans to construct and repair simple outdoor structures and minor building additions.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	5.6.2. Layout, cut, smooth, shape, and bore construction materials.	Question: Identify which tools are used to layout, cut, smooth, shape, and bore of construction materials.	Activity: Layout, cut, smooth, shape, or bore a construction material.	Project: Investigate the effectiveness of different brands of equipment used to layout, cut, smooth, shape, and bore materials cite evidence in a summary.	

LEVEL 2 Outcome 5.10.

Joining and Cutting Metals with Heat: Join and cut steel using heat in horizontal and vertical positions.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	5.10.3. Compare and contrast metal welding operating characteristics and performance (e.g., oxy-fuel, shielded metal arc, gas tungsten arc, braising, soldering).	Question: Identify and describe welding methods and situations appropriate for each method.	Activity: Compare and contrast metal welding operating characteristics and performance (e.g., oxy-fuel, shielded metal arc, gas tungsten arc, braising, soldering).	Project: Organize a chart to allow critique of welding panels making recommendations for improving individual practice.	

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Unit: Biotechnology

Learners will explore introductory principles in biotechnology, including microbiology and genetics to plant and animal research and product development. Students will apply genetic principles to determine genotypes and phenotypes and discover the career opportunities within these industries.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.3. Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options.	Question: What might you include in a career plan?	Activity: Identify and summarize steps you might take to pursue an identified career interest and explain how your high school courses align to your plan.	Activity: Given three career options, evaluate which career you would pursue at this time and provide rationale. Make sure to include supporting evidence.	Project: Investigate a professional in your community with the same/similar career field as your interest. Conduct an interview and describe how this career impacts the world and local community.
DOK 2	1.1.4. Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships.	Question: Define what a professional organization is, as well as its role and function.	Activity: Compare and contrast two different professional organizations of your interest. Present the information to the class using a visual device of your choice.	Project: Survey members of professional organizations. Inquire about their involvement, and industry association benefits. Be sure to include networking techniques and relationship building aspects.	Project: Design a professional organization of your own that you find a need for in a career field of your interest. What would its purpose be? Who would be members? Etc. Create a brochure to share with the class.

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LEVEL 2 Outcome 3.1.

Handling, Preparation, Transportation, Storage, and Disposal: Handle, prepare, transport, store, and dispose of specimens using procedures that minimize disturbance to the test specimen. Monitor, record and maintain the integrity of equipment and instrumentation, environmental conditions of the facility and the inventory.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	3.1.7. Select personal protective attire for various laboratory protocols.	Question: Identify PPE used in the lab.	Activity: Select personal protective attire for various laboratory protocols.	Activity: Given a specific situation, provide rationale for which PPE you would use and why.	

LEVEL 3 Outcome 3.4.

Molecular-Genetics Technology: Apply knowledge of nucleic acid structure and function, deoxyribonucleic acid (DNA) replication, transcription, translation, chromosome structure, and remodeling and regulation of gene expression in prokaryotes and eukaryotes.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	3.4.1. Use a Punnett square to predict and explain Mendel's Laws, genotype and phenotype.	Question: ♦ What is a Punnett Square used for? ♦ What is a genotype? ♦ What is a phenotype?	Activity: Use a Punnett square to predict and explain Mendel's Laws, genotype and phenotype.	Activity: Predict how many breeding trials will be needed for the red gene to be expressed in black Angus cattle.	Project: Create an experiment to breed a species for a specific trait and test your efficiency.

LEVEL 2 Outcome 3.6.

Culturing: Perform experimental techniques used in microbial biology to study cell growth, manipulation and evaluation.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	3.6.1. Identify the structure of cells and the functions of their components.	Question: List the structures of the cell.	Activity: Summarize the functions of each cell component.	Project: ♦ Construct a model demonstrating each component of the cell and dependence upon other components to function as one cell. ♦ Develop a procedure to adapt a corn cell to not produce a tassel.	

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Unit: Food Science

Students will be exposed to careers in the research, marketing, processing, and packaging techniques applied to the development of food products. Learners will be introduced to nutrient content in the development of food products.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.3. Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options.	Question: What might you include on a career plan?	Question: Identify and summarize steps you may take to pursue identified career interest and explain high school courses that align to your plan.	Activity: Given your three options, evaluate which career you would pursue at this time and provide rationale. Make sure to include supporting evidence.	Project: Investigate a professional in your community with the same/similar career field as your interest. Conduct an interview and describe how this career impacts the world and local community.
DOK 2	1.1.4. Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships.	Question: Define what a professional organization is, as well as its role and function.	Activity: Compare and contrast two different professional organizations that you may be interested in using visual device of your choice.	Project: Survey members on how involvement in a professional organization and industry associations benefits its membership professionally. Make sure to include networking techniques and relationship building aspects.	Project: Design a professional organization of your own that you find a need for in a career field of your interest. What would its purpose be? Who would be members? Etc.

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LEVEL 2 Outcome 7.2.

Quality Assurance: Inspect the food production process, locate potential sources of food quality, and safety deviations in facilities and prepare a corrective action plan.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	7.2.2. Describe the internal and external quality attributes that a food product should possess.	Question: Why would a food production facility be concerned with internal and external quality of a food product?	Question: Describe the internal and external quality attributes that a food product should possess.	Project: Develop a consumer evaluation test to evaluate the internal and external attributes of a food product. Report results.	

LEVEL 2 Outcome 7.5.

Food Product Development: Apply principles of nutrition and human behavior to create a new food prototype that meets a specific dietary need or demand for consumption, design packaging, and seek label approval.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	7.5.1. Conduct a sensory evaluation of food products.	Question: List 3 common sensory evaluation tests.	Question: What steps are needed to conduct ____ sensory evaluation test.	Activity: Evaluate and provide rationale for using ____ sensory evaluation test for ____ (attribute/product).	
DOK 2	7.5.4. Calculate nutrient values, serving sizes, and nutrient variability for a food product.	Activity: Make a chart listing <u>cereals</u> (product) by <u>serving size</u> (nutrient value, serving size, etc.).	Activity: Use provided <u>trail mix</u> (product) and <u>chart</u> (resource), calculate nutrient values, serving sizes and nutrient variability.	Project: Develop a new food product and accompanying nutrition panel complete with nutrient values and required labelling.	

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Unit: Animal Science

Students will be introduced to the five main areas of animals: production, exotic, companion, wildlife, and research. They will examine career opportunities in both the small and large animal sectors, as well as learn basic terminology to understand the similarities and differences of each.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.3. Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options.	Question: What might you include in a career plan?	Activity: Identify and summarize steps you might take to pursue an identified career interest and explain how your high school courses align to your plan.	Activity: Given three career options, evaluate which career you would pursue at this time and provide rationale. Make sure to include supporting evidence.	Project: Investigate a professional in your community with the same/similar career field as your interest. Conduct an interview and describe how this career impacts the world and local community.
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LEVEL 2 Outcome 2.3.

Care and Management: Apply animal care and management procedures to ensure animal husbandry and welfare, including managing environmental conditions to ensure animal health and performance.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 1	2.3.1. Identify species-specific terminology based on gender and age.	Question: Match the species specific terminology to their definition.	Question: How are the terms "ram" and "bull" alike and different? How are the terms "cow" and "heifer" alike and different?		
DOK 2	2.3.2. Identify, classify, evaluate, and select animal species or breeds for a desired outcome.	Question: Match the species to its final market product. Question: Rank the factors that determine the evaluation of a market or breeding animal.	Activity: Evaluate a given animal for a market purpose and support your answers with supporting evidence or details.	Project: Develop a tutorial to teach an individual how to evaluate an animal for a specific purpose (breeding or marketing).	

Agriculture, Food and Natural Resources

Subject Code: 010105

Meredith Wolfe-Oregon City Schools and David Stacklin-Penta Career Center

Unit: Plant and Horticulture Science

Students will be introduced to the main areas of the green industry (e.g. floral, turf grass, crop production, greenhouse management). They will examine career opportunities in both the research and production sectors, as well as learn basic terminology to understand the similarities and differences of each.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.3. Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options.	Question: What might you include in a career plan?	Activity: Identify and summarize steps you might take to pursue an identified career interest and explain how your high school courses align to your plan.	Activity: Given three career options, evaluate which career you would pursue at this time and provide rationale. Make sure to include supporting evidence.	Project: Investigate a professional in your community with the same/similar career field as your interest. Conduct an interview and describe how this career impacts the world and local community.
DOK 2	1.1.4. Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships.	Question: Define what a professional organization is, as well as its role and function.	Activity: Compare and contrast two different professional organizations of your interest. Present the information to the class using a visual device of your choice.	Project: Survey members of professional organizations. Inquire about their involvement, and industry association benefits. Be sure to include networking techniques and relationship building aspects.	Project: Design a professional organization of your own that you find a need for in a career field of your interest. What would its purpose be? Who would be members? Etc. Create a brochure to share with the class.

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LEVEL 2 Outcome 8.1.

Plant Nutrition: Select and apply macronutrients and micronutrients based on deficiencies, identified using testing application methods, and optimum management that account for environmental factors.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	8.1.3. Determine the nutrient requirements of plants.	Question: What does N-P-K stand for and where could you find it?	Question: Predict what a plant would look like with the lack of nitrogen? Phosphorus? Potassium?	Activity: Using soil test results, make recommendations for fertilizer application.	Project: Create an experiment to test the nutrient requirements of different plants.

LEVEL 2 Outcome 8.4.

Growth and Management: Manage and manipulate plant development through the selection, planting and growing of seeds and plants, based on global demand, economic importance and growing conditions.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 1	8.4.1. Identify and classify plants using taxonomy.	Question: Define the term taxonomy and state its importance.	Activity: Classify given plants (pictures/ sample plants) using taxonomy.		
DOK 2	8.4.4. Explain requirements necessary for photosynthesis to occur and identify the products and byproducts of photosynthesis.	Question: List the inputs and outputs of photosynthesis.	Activity: Construct a model demonstrating products and byproducts of photosynthesis and label.	Project: Conduct an experiment to test a product or by-product of photosynthesis.	

Agriculture, Food and Natural Resources

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Unit: Natural Resources

Students will be introduced to the various career opportunities in the natural resources areas, including forestry and wildlife, natural resource and energy management and water quality control. They will be exposed to the relationships between organisms and their environment.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.3. Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options.	Question: What might you include in a career plan?	Activity: Identify and summarize steps you might take to pursue an identified career interest and explain how your high school courses align to your plan.	Activity: Given three career options, evaluate which career you would pursue at this time and provide rationale. Make sure to include supporting evidence.	Project: Investigate a professional in your community with the same/similar career field as your interest. Conduct an interview and describe how this career impacts the world and local community.
DOK 2	1.1.4. Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships.	Question: Define what a professional organization is, as well as its role and function.	Activity: Compare and contrast two different professional organizations of your interest. Present the information to the class using a visual device of your choice.	Project: Survey members of professional organizations. Inquire about their involvement, and industry association benefits. Be sure to include networking techniques and relationship building aspects.	Project: Design a professional organization of your own that you find a need for in a career field of your interest. What would its purpose be? Who would be members? Etc. Create a brochure to share with the class.

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Subject Code: 010105

Meredith Wolfe-Oregon City Schools and David Stacklin-Penta Career Center

LEVEL 2 Outcome 6.1.

Soils: Apply knowledge of soil characteristics and soil information resources to overcome any existing soil use limitations while maintaining or improving soil quality.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 1	6.1.1. Identify soil forming factors and explain how they produce variability in soils.	Question: Match soil forming factors to their definition.	Question: Explain the effect of soil forming factors on the development of soil.		
DOK 2	6.1.3. Collect, test and analyze soil samples for physical and chemical properties.	Question: List the physical and chemical factors that are tested for in a soil test.	Activity: Collect, test and analyze soil samples for physical and chemical properties.	Activity: Using the information gathered from your soil test, make conclusions about what types of plants would grow best and what recommendations you could suggest for the area.	

LEVEL 2 Outcome 6.2.

Water Quality: Analyze, interpret and manage the biological, chemical and physical properties of water quality.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	6.2.1. Assess and explain the interactions between human activities and the Earth's hydrosphere (e.g., septic systems, desalinization, point and non-point source pollution).	Question: What products do humans put into and take out of the hydrosphere? Question: What is the hydrosphere?	Activity: Assess and explain the interactions between human activities and the Earth's hydrosphere (e.g., septic systems, desalinization, point and non-point source pollution).	Project: Create a poster demonstrating the proper functions of a septic system, desalinization, point source pollution, or non-point source pollution (student's choice).	

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LEVEL 2 Outcome 6.11.

Habitat Management and Restoration: Develop a plan for the management and restoration of a specific habitat.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 1	6.11.1. Differentiate the properties and characteristics of habitats.	Question: List the characteristics of a habitat.	Activity: Compare and contrast biotic factors and abiotic factors of a habitat.		Project: Wildlife habitat is disappearing at alarming rates for Native Ohio Species, your task is to enhance the livability of the species of your choice in your county of residence.
DOK 2	6.11.2. Examine sites and place them into ecological classifications.	Question: What are the ecological classifications?	Activity: Examine sites and place them into ecological classifications.	Activity: Travel to a location that is a habitat to local wildlife. Categorize into an ecological classification.	
DOK 2	6.11.3. Explain the impacts of an increasing human population on habitats.	Question: List ways humans impact wildlife habitat.	Question: Explain the impacts of an increasing human population on habitats.	Activity: Draw conclusions about the best methods of improving habitats despite increasing populations.	

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LEVEL 2 Outcome 9.1.

Energy Sources: Identify energy sources according to their economic viability, sustainability and environmental impact.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	9.1.1. Identify, compare and contrast fossil fuel sources and the technology used to generate energy.	Question: Identify fossil fuels and their sources.	Activity: Compare and contrast fossil fuel sources and the technology used to generate energy.	Project: Using color coding and maps, show how fossil fuel has increased production as a result of technological advancements.	Project: Develop a persuasive argument on renewable energy policy in your state or United States and why it is behind other parts of the world (states) and recommend changes.
DOK 2	9.1.2. Identify, compare and contrast renewable energy sources and the technology used to generate energy.	Question: How would you describe renewable energy? Make a list of renewable energy sources.	Activity: Compare and contrast five different sources of renewable energy using a graphic organizer. See rubric.	Activity: Select a renewable energy source you would use or determine is the best option. Cite evidence of what makes that renewable energy superior to the others?	
DOK 2	9.1.3. Identify, compare and contrast alternative energy sources and technology used to generate energy (e.g., fuel cells, hydrogen, nuclear).	Question: Identify alternative energy sources?	Activity: Compare and contrast alternative energy sources and technology used to generate energy (e.g., fuel cells, hydrogen, nuclear).	Project: Develop a persuasive argument citing evidence from multiple sources on alternative energy use.	
DOK 1	9.1.4. Identify the social, economic, and environmental drivers and barriers that influence the development and use of energy sources.	Question: List the social, economic, and environmental drivers and barriers that influence the development and use of energy sources.	Question: How would you explain the development location and use of energy production facilities in the United States?	Activity: Produce ideas to adapt the energy production industry in the United States to meet the world's standards on social, economic, and environmental factors?	

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Unit: Supervised Agricultural Experiences and Record Keeping

Students will use technology such as, word processors, databases, spreadsheets, and electronic mail to maintain accurate business records. They will explore entrepreneurial ventures, as well as research, placement and exploratory work-based learning options.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.3. Develop a career plan that reflects career interests, pathways, and secondary and postsecondary options.	Question: What might you include in a career plan?	Activity: Identify and summarize steps you might take to pursue an identified career interest and explain how your high school courses align to your plan.	Activity: Given three career options, evaluate which career you would pursue at this time and provide rationale. Make sure to include supporting evidence.	Project: Investigate a professional in your community with the same/similar career field as your interest. Conduct an interview and describe how this career impacts the world and local community.
DOK 2	1.1.4. Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships.	Question: Define what a professional organization is, as well as its role and function.	Activity: Compare and contrast two different professional organizations of your interest. Present the information to the class using a visual device of your choice.	Project: Survey members of professional organizations. Inquire about their involvement, and industry association benefits. Be sure to include networking techniques and relationship building aspects.	Project: Design a professional organization of your own that you find a need for in a career field of your interest. What would its purpose be? Who would be members? Etc. Create a brochure to share with the class.

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LEVEL 2 Outcome 1.6.

Business Literacy: Develop foundational skills and knowledge in entrepreneurship, financial literacy, and business operations.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.6.2. Assess the reality of becoming an entrepreneur, including advantages and disadvantages (e.g., risk versus reward, reasons for success and failure).	Question: Define entrepreneur. Give examples.	Question: Explain the advantages and disadvantages of becoming an entrepreneur.	Activity: Develop a poster identifying an entrepreneur and how they started a business (Agricultural).	Project: Develop a business plan including resources, advantages and disadvantages, sales projections, cost analysis, marketing, and budgets.
DOK 2	1.6.3. Explain the importance of planning your business.	Question: What are the parts of a successful business plan?	Activity: Make a presentation of a successful business plan.	Activity: Formulate a business plan for an agriculturally-related business.	
DOK 1	1.6.4. Identify types of businesses, ownership, and entities (i.e., individual proprietorships, partnerships, corporations, cooperatives, public, private, profit, not-for-profit).	Question: Identify different business structures in your local, state, and national area.	Activity: Classify the list of businesses into categories using a chart. Include advantages, disadvantages, etc.		
DOK 2	1.6.11. Describe how all business activities of an organization work within the parameters of a budget.	Question: Who determines a business' budget?	Activity: Describe how all business activities of an organization work within the parameters of a budget.	Project: Create a graphic organizer if your business has to cut 10% of its budget.	

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LEVEL 2 Outcome 1.4.

Knowledge Management and Information Technology: Demonstrate current and emerging strategies and technologies used to collect, analyze, record, and share information in business operations.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.4.1. Use office equipment to communicate (e.g., phone, radio equipment, fax machine, scanner, public address systems).	Question: Develop a list of office equipment used in agriculturally-related businesses.	Activity: Demonstrate the appropriate way to answer the phone when employed at an ag-related business.	Activity: Formulate a training plan for a new employee to use office equipment.	
DOK 2	1.4.2. Select and use software applications to locate, record, analyze, and present information (e.g., word processing, e-mail, spreadsheet, databases, presentation, Internet search engines).	Question: What software applications are commonly used in Agricultural careers?	Activity: Cite evidence and develop a logical argument for using a live budget.	Project: Create and use a spreadsheet to calculate soybean yield.	
DOK 2	1.4.4. Use system hardware to support software applications.	Question: Define system hardware and software applications.	Question: Explain how to use system hardware to support software applications.	Project: Prepare a model of system hardware that can be used to calculate corn yield in the field.	
DOK 2	1.4.5. Use information technology tools to maintain, secure, and monitor business records.	Question: Develop a list of technology tools to record business records.	Activity: Run an SAE report in AET.	Activity: Update records on AET record keeping system.	

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DOK 2	1.4.6. Use an electronic database to access and create business and technical information.	Question: How would you describe an electronic database?	Activity: Use an online storage system to organize business and technical information in an electronic database.	Activity: Create a system back up in case your main database crashes.	
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LEVEL 2 Outcome 1.7.

Entrepreneurship/Entrepreneurs: Analyze the environment in which a business operates and the economic factors and opportunities associated with self-employment.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.7.7. Create a list of personal strengths, weaknesses, skills, and abilities needed to be successful as an entrepreneur.	Question: What are strengths, weaknesses required of entrepreneurs?	Activity: Create a list of your strengths and weaknesses?	Project: Create a poster highlighting your strengths and weaknesses and how they can benefit or hinder you in your career field of interest?	

LEVEL 3 Outcome 1.8.

Operations Management: Plan, organize, and monitor an organization or department to maximize contribution to organizational goals and objectives.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 3	1.8.2. Select and organize resources to develop a product or a service.	Question: Define the term "product" or "service."	Question: What would you use to classify products or services?	Activity: Create your own new sustainable product and evaluate its feasibility.	Project: Create a marketing plan for your own new sustainable product.
DOK 2	1.8.9. Develop a budget that reflects the strategies and goals of the organization.	Question: Describe your FFA chapter's budget for the year and chart participation and funds spent on activities.	Activity: Calculate the percentage of funds spent on each activity.	Activity: Draw a conclusion as to which activity was most effective use of funds and which was the least effective. How would you use this information as an officer planning next year's POA?	

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LEVEL 2 Outcome 1.9.

Financial Management: Use financial tools, strategies and systems to develop, monitor and control the use of financial resources to ensure personal and business financial well-being.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 3	1.9.1. Create, analyze, and interpret financial documents (e.g., budgets, income statements).	Question: Make a collage showing financial documents.	Activity: Organize the previous year FFA budget and interpret categories of use.	Activity: Analyze the FFA budget and report waste.	Project: Gather your SAE/ classroom project materials, produce a financial document making recommendations for expenditures on a percentage basis.
DOK 2	1.9.3. Review and summarize savings, investment strategies and purchasing options (e.g., cash, lease, finance, stocks, bonds).	Question: Recognize investment strategies.	Question: How would you compare common investment strategies?	Activity: Adopt investment strategies to manage financial risk of a landowner.	
DOK 1	1.9.8. Identify income sources and expenditures.	Question: Identify income sources and expenditures.	Question: Explain how income affects expenditures.		

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Unit: FFA

Students will demonstrate how FFA can make a positive influence in leadership skills. Students will lead group discussions, conduct business meetings using Robert’s Rules of Order, as well as demonstrate the professionalism needed to foster positive working relationships. They will be introduced to the structure, history and opportunities within the organization and how these serve as foundational career skills.

LEVEL 2 Outcome 1.1.

Employability Skills: Develop career awareness and employability skills (e.g., face-to-face, online) needed for gaining and maintaining employment in diverse business settings.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 2	1.1.4. Describe the role and function of professional organizations, industry associations, and organized labor and use networking techniques to develop and maintain professional relationships.	Question: Define what a professional organization is, as well as its role and function.	Activity: Compare and contrast two different professional organizations of your interest. Present the information to the class using a visual device of your choice.	Project: Survey members of professional organizations. Inquire about their involvement, and industry association benefits. Be sure to include networking techniques and relationship building aspects.	Project: Design a professional organization of your own that you find a need for in a career field of your interest. What would its purpose be? Who would be members? Etc. Create a brochure to share with the class.

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LEVEL 2 Outcome 1.2.

Leadership and Communications: Process, maintain, evaluate and disseminate information in a business. Develop leadership and team building to promote collaboration.

Prog	Competency	DOK 1	DOK 2	DOK 3	DOK 4
DOK 1	1.2.1. Extract relevant, valid information from materials and cite sources of information.	Question: What is considered a quality resource?	Activity: Compare and contrast resources and determine their quality.		Project: Contact local community members, build a cover letter, resume, and references. Conduct a formal and informal interview process.
DOK 2	1.2.2. Deliver formal and informal presentations.	Question: List the parts of a quality presentation.	Activity: Deliver a formal or informal presentation.	Activity: Provide constructive feedback to peers while watching their formal or informal presentations.	
DOK 2	1.2.5. Communicate information (e.g., directions, ideas, vision, workplace expectations) for an intended audience and purpose.	Question: How would your communication style change based on your intended audience profile?	Activity: Communicate a topic to a partner in order to inform them of the topic.	Activity: Provide constructive feedback to peers while watching them communicate for a specific purpose.	
DOK 1	1.2.6. Use proper grammar and expression in all aspects of communication.	Question: List five grammatical rules to follow when communicating.	Activity: Write a paragraph using proper grammar.	Activity: Provide grammatical constructive feedback to a peer on their paragraph.	
DOK 2	1.2.7. Use problem-solving and consensus-building techniques to draw conclusions and determine next steps.	Question: What are problem-solving and consensus-building techniques?	Activity: Given a scenario, work with a group to solve a problem.	Activity: Observe another group working on solving the problem in the previous question. Provide feedback as to how they could improve their techniques.	

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DOK 3	1.2.13. Identify stakeholders and solicit their opinions.	Question: What is a stakeholder? Make a list of stakeholders in your FFA chapter.	Activity: ◆ Make a chart <u>FFA</u> (Organization) showing stakeholders. ◆ What would their opinion be regarding ____.	Project: Construct a database of FFA stakeholders and survey them over relevant issues.	Project: Create a survey for stakeholders. Interpret the results and make persuasive recommendations to the Advisor.
DOK 2	1.2.14. Use motivational strategies to accomplish goals.	Question: Develop a list of motivational strategies.	Question: Explain which motivational strategy would best apply to you.	Activity: Formulate a plan according to the best motivational strategy to study for the next CDE you would like to participate in.	