ND FFA Association

# FOOD SCIENCE & TECHNOLOGY

## CDE Handbook

## Purpose

The food science and technology career development event is designed to promote learning activities in food science and technology related to the food industry and to assist students in developing practical knowledge of principles used in a team decision-making process.

Each year this career development event will focus on one food product category as a theme. Each activity in this event will use the theme food product category to achieve the project objectives. The state event will follow the theme selected by the National FFA.

Possible Products:

| | | |
|---|---|---|
| Ready-to-Eat Cereal | Breakfast Bars | Candy |
| Ready to Eat Snacks | Cheese | Ice Cream |
| Processed Fruit Snacks | Stir-Fried Vegetables | Processed Meat |
| Imitation Seafood | | |

## Objectives

The Food Science and Technology Career Development event provides the opportunity for the participant to:

a. Gain an awareness of career and professional opportunities in the field of food science and technology.
b. Experience group participation and leadership responsibilities in a competitive food science and technology program.
c. Develop technical competence and personal initiative in a food science and technology occupation.

## Rules

a. This event will be a four- or five-person team activity. Individuals may participate and will not complete the team activity.
b. All team members will participate in each of the activities.

c. No programmable calculators will be allowed to be used during any part of this CDE.
d. Participants will utilize Food Science Form # 479-4 for the entire event.
e. See Career Development Events section for further rules on eligibility, selection of teams, and general rules.

## Awards

a. Individual

1. Individual scores will be tabulated (and do not include the team activity) and broken into gold, silver, and bronze award areas.
2. Individual ties will not be broken
3. The high individual receives the "baby bison" trophy and a $250 stipend.

b. Team

1. Team scores will be tabulated by adding all four team member scores and the team activity. They will be broken into gold, silver, and bronze.
2. The high team shall be eligible to represent North Dakota in the National FFA Food Science career development event. The high team receives the traveling trophy and travel stipends from the ND FFA Foundation to participate in the National Event.

Team Tie Breakers: 1) Team Product Development Score

2) Team Written Test Score

3) Team Questions to Product Development Score

## Format

The Food Science and Technology CDE will consist of four activities:

a. Written Test

1. The written test questions will be designed to determine each team member's understanding of the basic principles of food science and technology. It will encompass the knowledge required of the team event and the two practicums, as well as test a participant's knowledge of the equipment used to manufacture the theme product and product nutritional analysis.
2. Team members will work individually to answer each of the fifty (50) questions. Fifty (50) minutes will be given to complete the examination.
3. Each question will be worth three (3) points.

b. Problem Solving/Math Practicum

1. Participants will answer a series of five mathematical calculations based on common food science themes. Questions may include nutrition calculations, ingredient quantity, cost benefit analysis, estimation of cost/margin of good sold, conversions, processing conditions, etc.
2. This section is worth 25 points.

3. Example:

The perfect glass of sweet tea is 20 percent sugar. Jim is making a one-gallon container of sweet tea. How many cups of sugar should he add?

a. 2.4 cups b. 3.2 cups c. 3.4 cups d. 4 cups

c. Food Safety and Quality Practicums

1. Customer Inquiry

a. Each participant will be given five scenarios representing general consumer inquiries. Participants must determine if the consumer inquiry reflects a quality or safety issue (2 points per scenario) and determine if it is a biological, chemical, or physical concern or hazard (3 points per section).

b. This is for a total of 25 points.

2. Product Specification Compliance

a. Students will be given sample sets (actual products and/or data sets) and will be responsible for determining compliance with the provided specification requirements.

b. This may include, but is not limited to, determining if the product(s) is within the net weight standards, product sizing requirements, pH, color, analysis, viscosity measurement, fill level tolerance, packaging specification compliance, etc.

c. Participants will be asked five questions regarding potential compliance violations presented within the sample set.

d. This is for a total of 25 points.

d. Sensory Evaluation

1. Aroma Identification

a. Each participant will be asked to identify four different aromas from vials provided. A list of potential aromas is included on the scorecard and listed below.

b. Each aroma is worth 5 points for a total of 20 points.

| | | | | | |
|---|---|---|---|---|---|
| Apple | Chocolate | Garlic | Lime | Orange | Sage |
| Banana | Cinnamon | Ginger | Maple | Oregano | Smoke (liquid) |
| Basil | Clove | Grape | Molasses | Peach | Strawberry |
| Butte | Coconut | Lemon | Nutmeg | Peppermint | Vanilla |
| Cherry | Coffee | Licorice (anise) | Onion | Raspberry | Watermelon |
| | | | | | Wintergreen |

2. Triangle Tests

    b. Four triangle tests will be conducted. In each test, there will be three samples, two that are the same and one that is different in some way. Participants are expected to identify the different sample through aroma, visual cues or textural differences.
    c. Each test is worth 5 points for a total of 20 points.

e. Team Product Development

1. Each team will receive a marketing scenario describing a need for a new or redesigned product that would appeal to a potential market segment. This scenario will contain a description of the existing marketing situation, and potential target market segment to be served by the new product. Each team will be provided with package materials, supplies for designing package, ingredients and ingredient labels.
2. The team will be responsible for understanding and using the following concepts:

    b. Formulation of a product to meet specific market requirements
    c. New package design to reflect the developed product
    d. Nutritional label development and adjustments
    e. Equipment used to formulate the product

f. Address any potential quality control and assurance issues

3. The team will have sixty (60) minutes to respond to the marketing scenario and reformulate or develop a new product, correctly calculate a nutritional label, develop the ingredient statement and educational panel and develop the front or principal display panel to reflect the new product and its market.

4. After this time period, each team member will be expected to participate in a ten (10) minute oral product development proposal.

5. In addition, there will be a five (5) minute question period in which each team member will be expected to answer questions from the judges

g. Food Safety/Sanitation Team activity (80 points possible per team)

1. Each team will be given a situation (e.g., photos, videos, written scenarios, live demonstrations or a combination). The team will work to together to evaluate the situation and complete a safety/sanitation report evaluation that will include observations, degree of concern and recommendations/corrective actions.

2. Scoring criteria can be found on the Team Activity Preparation Rubric.

## Resources

a. National FFA Food Science and Technology CDE guide/materials.
b. Team Sanitation FDA Resource

## Scoring

| Activities | Individual Points | Team Points |
|---|---|---|
| Team Product Development | | 400 |
| Food Safety/Sanitation Team Activity | | 80 |
| Written Test | 150 | 600 |
| Problem Solving/Math Practicum | 25 | 100 |
| Food Safety and quality | 50 | 200 |
| Sensory Evaluation | 40 | 160 |
| Maximum Points | 265 | 1540 |

# Agriculture, Food and Natural Resource Content Standards

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| **ABS.01.03. Performance Indicator: Devise and apply management skills to organize and run an AFNR business in an efficient, legal and ethical manner.** | | |
| ABS.01.03.02.a. Identify and explain appropriate local, state, federal, international and industry regulations that impact the management and operation of AFNR businesses. | Objective test | CCSS.ELA-LITERACY.SL.9-10.6<br>CCSS.ELA-LITERACY.SL.11-12.6<br>CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4 |
| ABS.01.03.02.c. Devise management or operational strategies to address and adhere to local, state, federal, international and industry regulations. | Team activity | CCSS.ELA-LITERACY.SL.9-10.6<br>CCSS.ELA-LITERACY.SL.11-12.6<br>CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4 |
| **ABS.02.02. Performance Indicator: Assemble, interpret and analyze financial information and reports to monitor AFNR business performance and support decision-making (e.g., income statements, balance sheets, cash-flow analysis, inventory reports, break-even analysis, return on investment, taxes, etc.).** | | |
| ABS.02.02.02.b. Use accounting information to prepare financial reports associated with inventory in AFNR businesses (e.g., cost of goods sold, margins on goods, etc.). | Math/Problem solving<br>Team activity | CCSS.ELA-LITERACY.W.9-10.9<br>CCSS.ELA-LITERACY.W.11-12.9<br>CCSS.ELA-LITERACY.RH.9-10.7<br>CCSS.ELA-LITERACY.RH.11-12.7<br>CCSS.MATH.CONTENT.HSS.ID.C.7<br>CCSS.MATH.CONTENT.HSS.IC.B.6<br>CCSS.MATH.CONTENT.HSN.Q.A.1<br>Savings: Benchmarks: Grade 12, Statements 3<br>Savings: Benchmarks: Grade 12, Statements 4<br>Savings: Benchmarks: Grade 12, Statements 6<br>Savings: Benchmarks: Grade 12, Statements 7<br>Financial Investing: Benchmarks: Grade 12, Statement 2 |
| **ABS.04.01. Performance Indicator: Analyze characteristics and planning requirements associated with developing business plans for different types of AFNR businesses.** | | |
| ABS.04.01.03.c. Prepare business plans for an AFNR business. | Team activity | CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4<br>CCSS.ELA-LITERACY.W.9-10.2<br>CCSS.ELA-LITERACY.W.11-12.2<br>CCSS.ELA-LITERACY.W.9-10.9<br>CCSS.ELA-LITERACY.W.11-12.9 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| **ABS.04.02. Performance Indicator: Develop production and operational plans for an AFNR business.** | | |
| ABS.04.02.02.a. Devise strategies to illustrate the production process of an AFNR business to produce a specific agricultural product. | Team activity | AFNR Career Cluster – Agribusiness Systems Pathway, Statement 3<br>CCSS.ELA-LITERACY.ELA-W.9-10.2<br>CCSS.ELA-LITERACY.W.11-12.2<br>CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4 |
| ABS.04.02.02.b. Identify and assess alternative production systems for a specific agricultural product. | Team activity | AFNR Career Cluster – Agribusiness Systems Pathway, Statement 3<br>CCSS.ELA-LITERACY.ELA-W.9-10.2<br>CCSS.ELA-LITERACY.W.11-12.2<br>CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4 |
| ABS.04.02.02.c. Create strategies to improve the production process of an agricultural product for an AFNR facility (e.g., SWOT — strengths, weaknesses, opportunities and threats, supply chain management, etc.). | Team activity | AFNR Career Cluster – Agribusiness Systems Pathway, Statement 3<br>CCSS.ELA-LITERACY.ELA-W.9-10.2<br>CCSS.ELA-LITERACY.W.11-12.2<br>CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4 |
| **ABS.05.02. Performance Indicator: Assess and apply sales principles and skills to accomplish AFNR business objectives.** | | |
| ABS.05.02.01.a. Identify and explain components of the sales process for AFNR businesses (e.g., understanding needs, develop solutions, close sale, etc.). | Team activity | CCSS.ELA-LITERACY.SL.9-10.6<br>CCSS.ELA-LITERACY.SL.11-12.6<br>CCSS.ELA-LITERACY.RH.9-10.7<br>CCSS.ELA-LITERACY.RH.11-12.7<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 1<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 3<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 4<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 5 |
| ABS.05.02.01.b. Apply the sales process to AFNR businesses and communicate ways of accomplishing the businesses' goals and objectives. | Team activity | CCSS.ELA-LITERACY.SL.9-10.6<br>CCSS.ELA-LITERACY.SL.11-12.6<br>CCSS.ELA-LITERACY.RH.9-10.7<br>CCSS.ELA-LITERACY.RH.11-12.7<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 1<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 3<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 4 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| | | Buying Goods & Services: Benchmarks: Grade 12, Statements 5 |
| **ABS.05.03. Performance Indicator: Assess marketing principles and develop marketing plans to accomplish AFNR business objectives.** | | |
| ABS.05.03.01.a. Identify and explain marketing principles used in AFNR businesses (4 P's — product, place, price, promotion; attention, interest, desire, action, etc.). | Objective test<br>Team activity | AFNR Career Cluster – Agribusiness Systems Pathway, Statement 4 |
| ABS.05.03.01.b. Assess alternative marketing strategies as related to marketing principles for AFNR businesses (e.g. value-adding, branding, niche marketing, etc.). | Team activity | CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4<br>CCSS.ELA-LITERACY.W.9-10.2<br>CCSS.ELA-LITERACY.W.11-12.2<br>CCSS.ELA-LITERACY.RH.9-10.7<br>CCSS.ELA-LITERACY.RH.11-12.7<br>CCSS.ELA-LITERACY.SL.9-10.6<br>CCSS.ELA-LITERACY.SL.11-12.6<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 1<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 3<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 4<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 7 |
| ABS.05.03.02.b. Compare and contrast the strategies of marketing for products and services used in AFNR businesses (e.g., direct marketing, commodities, etc.). | Team activity | CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4<br>CCSS.ELA-LITERACY.W.9-10.2<br>CCSS.ELA-LITERACY.W.11-12.2<br>CCSS.ELA-LITERACY.RH.9-10.7<br>CCSS.ELA-LITERACY.RH.11-12.7<br>CCSS.ELA-LITERACY.SL.9-10.6<br>CCSS.ELA-LITERACY.SL.11-12.6<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 1<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 3<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 4<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 7 |
| ABS.05.03.03.a. Research and define the purpose, components and developmental processes of marketing plans for AFNR businesses. | Team activity | CCSS.ELA-LITERACY.L.9-10.6<br>CCSS.ELA-LITERACY.L.11-12.6<br>CCSS.ELA-LITERACY.RST.9-10.4<br>CCSS.ELA-LITERACY.RST.11-12.4<br>CCSS.ELA-LITERACY.W.9-10.2 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| | | CCSS.ELA-LITERACY.W.11-12.2<br>CCSS.ELA-LITERACY.RH.9-10.7<br>CCSS.ELA-LITERACY.RH.11-12.7<br>CCSS.ELA-LITERACY.SL.9-10.6<br>CCSS.ELA-LITERACY.SL.11-12.6<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 1<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 3<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 4<br>Buying Goods & Services: Benchmarks: Grade 12, Statements 7 |
| **BS.01.01. Performance Indicator: Investigate and explain the relationship between past, current and emerging applications of biotechnology in agriculture (e.g., major innovators, historical developments, potential applications of biotechnology, etc.).** | | |
| BS.01.01.01.a. Research and summarize the evolution of biotechnology in agriculture. | Objective test | CCSS.ELA-Literacy.RI.9-10.1<br>CCSS.ELA-Literacy.RI.11-12.1<br>CCSS.ELA-Literacy.RI.9-10.6<br>CCSS.ELA-Literacy.RI.11-12.6<br>CCSS.ELA-Literacy.WI.9-10.2<br>CCSS.ELA-Literacy.WI.11-12.2 |
| **BS.01.02. Performance Indicator: Evaluate the scope and implications of regulatory agencies on applications of biotechnology in agriculture and protection of public interests (e.g., health, safety, environmental issues, etc.).** | | |
| BS.01.02.01.a. Compare and contrast differences between regulatory systems worldwide. | Objective test | CCSS.ELA-Literacy.RI.9-10.5<br>CCSS.ELA-Literacy.RI.11-12.5<br>CCSS.ELA-Literacy.RI.9-10.6<br>CCSS.ELA-Literacy.RI.11-12.6 |
| **BS.02.02. Performance Indicator: Implement standard operating procedures for the proper maintenance, use and sterilization of equipment in a laboratory.** | | |
| BS.02.02.01.a. Research and implement standard operating procedures for laboratory equipment. | Team activity | |
| BS.02.02.02.b. Manipulate basic laboratory equipment and measurement devices (e.g., water bath, electrophoresis equipment, micropipettes, laminar flow hood, etc.). | Team activity | |
| **BS.02.04. Performance Indicator: Safely manage and dispose of biological materials, chemicals and wastes according to standard operating procedures.** | | |
| BS.02.04.01.a. Research types of personal protective equipment and summarize how to properly utilize the equipment. | Objective Test<br>Team activity | CCSS.ELA-Literacy.RST.9-10.4<br>CCSS.ELA-Literacy.RST.11-12.4 |
| BS.02.04.01.b. Assess the need for personal protective equipment and select the appropriate equipment to wear when working with biological and chemical materials. | Food safety and quality practicums | CCSS.ELA-Literacy.RST.9-10.4<br>CCSS.ELA-Literacy.RST.11-12.4 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| **BS.02.05. Performance Indicator: Examine and perform scientific procedures using microbes, DNA, RNA and proteins in a laboratory.** | | |
| BS.02.05.05.a. Synthesize the relationship between proteins, enzymes and antibodies. | Objective test | CCSS.ELA-Literacy.RST.9-10.3<br>CCSS.ELA-Literacy.RST.11-12.3 |
| **BS.03.02. Performance Indicator: Apply biotechnology principles, techniques and processes to enhance the production of food through the use of microorganisms and enzymes.** | | |
| BS.03.02.02.a. Examine enzymes, the changes they cause, and the physical and chemical parameters that affect enzymatic reactions (e.g., food, cellulosic bioenergy, etc.). | Objective test | HS-LS3-1 |
| BS.03.02.03.a. Identify and categorize foods produced through biotechnology (e.g., fermentation, etc.). | Objective test | |
| **BS.03.03. Performance Indicator: Apply biotechnology principles, techniques and processes to protect the environment and maximize use of natural resources (e.g., biomass, bioprospecting, industrial biotechnology, etc.).** | | |
| BS.03.03.02.a. Define and summarize industrial biotechnology and categorize the benefits and risks associated with its use in manufacturing (e.g., fabrics, plastics, etc.). | Objective test | |
| **BS.03.05. Performance Indicator: Apply biotechnology principles, techniques and processes to produce biofuels (e.g., fermentation, transesterification, methanogenesis, etc.).** | | |
| BS.03.05.03.a. Research and explain the process of fermentation. | Objective test | AFNR Career Cluster, Statement 5<br>CCSS.ELA-Literacy.RI.9-10.1<br>CCSS.ELA-Literacy.RI.11-12.1<br>CCSS.ELA-Literacy.RST.9-10.3<br>CCSS.ELA-Literacy.RST.11-12.3 |
| **FPP.01.01. Performance Indicator: Analyze and manage operational and safety procedures in food products and processing facilities.** | | |
| FPP.01.01.01.a. Research purposes and objectives of safety programs in food products and processing facilities (e.g., Sanitation Standard Operating Procedures (SSOP); Good Manufacturing Practices (GMP); worker safety, etc.). | Objective text<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>AFNR Career Cluster, Statement 6<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 2<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 4<br>Manufacturing Career Cluster – Production Pathway 2<br>Manufacturing Career Cluster – Production Pathway 3 |
| FPP.01.01.01.b. Analyze and document attributes and procedures of current safety programs in food products and processing facilities. | Food safety and quality practicums | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>AFNR Career Cluster, Statement 6 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| | | Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 2<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 4<br>Manufacturing Career Cluster – Production Pathway 2<br>Manufacturing Career Cluster – Production Pathway 3 |
| FPP.01.01.01.c. Construct plans that ensure implementation of safety programs for food products and processing facilities. | Food safety and quality practicums<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>AFNR Career Cluster, Statement 6<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 2<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 4<br>Manufacturing Career Cluster – Production Pathway 2<br>Manufacturing Career Cluster – Production Pathway 3 |
| FPP.01.01.02.a. Research and categorize types of equipment used in food products and processing systems. | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>AFNR Career Cluster, Statement 6<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 2<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 4<br>Manufacturing Career Cluster – Production Pathway 2<br>Manufacturing Career Cluster – Production Pathway 3 |
| FPP.01.01.02.b. Assess equipment and facility maintenance used in food products and processing systems (e.g., specifications for machines, sanitation procedures, repair protocol, etc.). | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>AFNR Career Cluster, Statement 6<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 2<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 4<br>Manufacturing Career Cluster – Production Pathway 2 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| | | Manufacturing Career Cluster – Production Pathway 3 |
| FPP.01.01.02.c. Devise strategies to maintain equipment and facilities for food products and processing systems. | Team activity<br>Food safety and quality practicums | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>AFNR Career Cluster, Statement 6<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 2<br>Manufacturing Career Cluster – Maintenance, Installation and Repair Pathway Statement 4<br>Manufacturing Career Cluster – Production Pathway 2<br>Manufacturing Career Cluster – Production Pathway 3 |
| **FPP.01.02. Performance Indicator: Apply food safety and sanitation procedures in the handling and processing of food products to ensure food quality.** | | |
| FPP.01.02.01.a. Examine contamination hazards associated with food products and processing (e.g., physical, chemical and biological). | Food safety and quality practicums<br>Objective test<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| FPP.01.02.01.b. Outline procedures to eliminate possible contamination hazards associated with food products and processing. | Food safety and quality practicums<br>Objective test<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| FPP.01.02.01.c. Identify sources of contamination in food products and/or processing facilities and develop ways to eliminate contamination. | Food safety and quality practicums<br>Objective test<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| FPP.01.02.02.a. Research and summarize procedures of safe handling protocols (e.g., Hazard Analysis and Critical Control Points Plan (HACCP); Critical Control Point procedures (CCP); Good Agricultural Practices Plan (GAP), etc.). | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| FPP.01.02.02.b. Construct plans that ensure implementation of safe handling procedures on food products. | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| FPP.01.02.02.c. Examine, interpret and report outcomes from safe handling procedures and results from quality assurance tests. | Food safety and quality practicums | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| FPP.01.02.03.a. Research purposes and objectives of quality assurance tests on food products (e.g., produce safety regulation, safe food transport, food contaminants, etc.). | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| FPP.01.02.03.c. Interpret and evaluate results of quality assurance tests on food products and examine steps to implement corrective procedures. | Food safety and quality practicums | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| FPP.01.02.04.a. Describe the effects food-borne pathogens have on food products and humans. | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| FPP.01.02.04.c. Conduct and interpret microbiological tests for food-borne pathogens. | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |
| **FPP.01.03. Performance Indicator: Apply food safety procedures when storing food products to ensure food quality.** | | |
| FPP.01.03.01.a. Identify and summarize purposes of food storage procedures (e.g., first in/first out, temperature regulation, monitoring, etc.). | Objective test | |
| FPP.01.03.01.b. Analyze characteristics of food products and determine appropriate storage procedures. | Food safety and quality practicums | |
| FPP.01.03.01.c. Prepare plans that ensure implementation of proper food storage procedures. | Food safety and quality practicums<br>Team activity | |
| FPP.01.03.02.a. Assess procedures of electronic and paper-based documentation methods in food products and processing systems. | Food safety and quality practicums<br>Team activity | |
| FPP.01.03.02.b. Demonstrate and explain methods of documentation procedures within food products and processing systems. | Team activity | |
| FPP.01.03.02.c. Evaluate the effectiveness of a current documentation procedure used within a food products and processing facility and recommend improvements. | Team activity | |
| **FPP.02.01. Performance Indicator: Apply principles of nutrition and biology to develop food products that provide a safe, wholesome and nutritious food supply for local and global food systems.** | | |
| FPP.02.01.01.a. Research and summarize properties of common food constituents (e.g., proteins, carbohydrates, fats, vitamins, minerals). | Objective test | |
| FPP.02.01.01.b. Compare and contrast the relative value of food constituents relative to food product qualities (e.g., taste, appearance, etc.). | Objective test<br>Sensory evaluation practicums<br>Team activity | |
| FPP.02.01.01.c. Analyze the properties of food products to identify food constituents and evaluate nutritional value. | Objective test<br>Team activity | |
| FPP.02.01.02.b. Compare and contrast the nutritional needs of different human diets. | Objective test | |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| **FPP.02.02. Performance Indicator: Apply principles of microbiology and chemistry to develop food products to provide a safe, wholesome and nutritious food supply for local and global food systems.** | | |
| FPP.02.02.01.a. Examine the basic chemical makeup of different types of food. | Objective test | |
| FPP.02.02.01.b. Explain how the chemical and physical properties of foods influence nutritional value and eating quality. | Objective test<br>Sensory evaluation practicums | |
| FPP.02.02.01.c. Design and conduct experiments to determine the chemical and physical properties of food products. | Sensory evaluation practicums | |
| FPP.02.02.02.a. List common food additives and identify their properties (e.g., preservatives, antioxidants, buffers, stabilizers, colors, flavors, etc.). | Objective test | |
| FPP.02.02.02.b. Describe the purpose of common food additives and how they influence the chemistry of food. | Objective test | |
| FPP.02.02.03.a. Research the application of biochemistry in the development of new food products (e.g., value added food products, genetically engineered food products, etc.). | Objective test | |
| FPP.02.02.03.a. Analyze how food products and processing facilities use biochemistry concepts to develop new food products. | Objective test | |
| **FPP.02.03. Performance Indicator: Apply principles of human behavior to develop food products to provide a safe, wholesome and nutritious food supply for local and global food systems.** | | |
| FPP.02.03.01.a. Examine the importance of food labeling to the consumer. | Objective test<br>Team activity | |
| FPP.02.03.01.b. Examine, interpret and explain the meaning of required components on a food label. | Objective test<br>Team activity | |
| FPP.02.03.01.c. Determine a strategy to prepare and label foods according to the established standards of regulatory agencies. | Objective test<br>Team activity | |
| FPP.02.03.02.a. Research factors in planning and developing a new food product (e.g., regulation, creativity, economics, etc.). | Objective test<br>Team activity | |
| FPP.02.03.02.b. Determine consumer preference and market potential for a new food product. | Team activity | |
| FPP.02.03.02.c. Design new food products that meet a variety of goals (e.g., consumer preferences, market, nutritional needs, regulatory requirements, etc.). | Team activity | |
| **FPP.03.01. Performance Indicator: Implement selection, evaluation and inspection techniques to ensure safe and quality food products.** | | |
| FPP.03.01.01.a. Summarize characteristics of quality and yield grades of food products. | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| | | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.01.b. Analyze factors that affect quality and yield grades of food products. | Objective test<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.02.a. Summarize procedures to select raw food products based on yield grades and quality grades. | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.02.b. Assemble procedures to perform quality-control inspections of raw food products for processing. | Objective test<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.02.c. Develop care and handling procedures to maintain original food quality and yield. | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.03.a. Identify and describe protocols for inspection and harvesting techniques for animal food products (e.g., pre-mortem and post-mortem inspections, Food Safety Inspection Service guidelines (FSIS), etc.). | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.03.b. Examine and evaluate inspection and harvesting of animals using regulatory agency approved or industry-approved techniques. | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.04.a. Identify and describe foods derived from different classifications of food products (e.g., meat, egg, poultry, fish, dairy, fruits, vegetables, grains, legumes, oilseeds, etc.). | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.04.b. Examine and summarize desirable qualities of food products derived from different classifications of food products. | Objective test<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| | | Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.03.01.04.c. Evaluate and grade food products from different classifications of food products. | Sensory evaluation practicums<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 1<br>AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 2<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| **FPP.03.02. Performance Indicator: Design and apply techniques of food processing, preservation, packaging and presentation for distribution and consumption of food products.** | | |
| FPP.03.02.01.a. Identify and explain English and metric measurements used in the food products and processing industry. | Math/Problem solving Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.01.b. Compare weights and measurements of products and perform conversions between units of measure. | Math/Problem solving<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.01.c. Design plans to formulate and package food products using a variety of weights and measures. | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.02.a. Differentiate between methods and materials used for processing food for different markets (e.g., fresh food products, ready to eat food products, etc.). | Objective test<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.02.b. Outline appropriate methods and prepare foods for sale and distribution for different markets. | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.02.c. Evaluate food quality factors on foods prepared for different markets (e.g., shelf life, shrinkage, appearance, weight, etc.). | Food safety and quality practicums<br>Sensory evaluation practicums<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.03.a. Identify methods of food preservation and give examples of foods preserved by each method. | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.03.b. Analyze and document food preservation processes and methods on a variety of food products. | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.03.c. Devise strategies to preserve different foods using various methods and techniques. | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.04.a. Summarize types of materials and methods used in food packaging and presentation. | Objective test | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.04.b. Analyze the degree of desirable food qualities of foods stored in various packaging | Food safety and quality practicums<br>Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |
| FPP.03.02.04.c. Construct and implement methods of selecting packaging materials to store a variety of food products. | Team activity | AFNR Career Cluster – Food Products and Processing Systems Pathway, Statement 3 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| **FPP.03.03. Performance Indicator: Create food distribution plans and procedures to ensure safe delivery of food products.** | | |
| FPP.03.03.01.a. Assess the environmental impact of distributing food locally and globally. | Objective test | AFNR Career Cluster, Statement 7<br>AFNR Career Cluster – Food Products and Processing Pathway, Statement 3<br>Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2<br>Transportation, Distribution and Logistics Career Cluster, Statement 3<br>CCSS.ELA-Literacy.W.9-10.2<br>CCSS.ELA-Literacy.W.11-12.2<br>HS-ETS1-2 |
| FPP.03.03.02.a. Examine the various paths food products take to get from food processing centers to consumers. | Objective test | AFNR Career Cluster, Statement 7<br>AFNR Career Cluster – Food Products and Processing Pathway, Statement 3<br>Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2<br>Transportation, Distribution and Logistics Career Cluster, Statement 3<br>CCSS.ELA-Literacy.W.9-10.2<br>CCSS.ELA-Literacy.W.11-12.2<br>HS-ETS1-2 |
| FPP.03.03.02.b. Interpret safety procedures used in food distribution to ensure a safe product is being delivered to consumers. | Team activity | AFNR Career Cluster, Statement 7<br>AFNR Career Cluster – Food Products and Processing Pathway, Statement 3<br>Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2<br>Transportation, Distribution and Logistics Career Cluster, Statement 3<br>CCSS.ELA-Literacy.W.9-10.2<br>CCSS.ELA-Literacy.W.11-12.2<br>HS-ETS1-2 |
| FPP.03.03.02.c. Make recommendations to improve safety procedures used in food distribution scenarios to ensure a safe product is being delivered to consumers. | Food safety and quality practicums | AFNR Career Cluster, Statement 7<br>AFNR Career Cluster – Food Products and Processing Pathway, Statement 3 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| | | Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2<br>Transportation, Distribution and Logistics Career Cluster, Statement 3<br>CCSS.ELA-Literacy.W.9-10.2<br>CCSS.ELA-Literacy.W.11-12.2<br>HS-ETS1-2 |
| FPP.03.03.03.a. Research and summarize different types of market demands for food products (e.g., local food, organic, non-GMO, etc.). | Objective test | AFNR Career Cluster, Statement 7<br>AFNR Career Cluster – Food Products and Processing Pathway, Statement 3<br>Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2<br>Transportation, Distribution and Logistics Career Cluster, Statement 3<br>CCSS.ELA-Literacy.W.9-10.2<br>CCSS.ELA-Literacy.W.11-12.2<br>HS-ETS1-2 |
| FPP.03.03.03.b. Assess how market demand for food products influences the distribution of food products. | Team activity | AFNR Career Cluster, Statement 7<br>AFNR Career Cluster – Food Products and Processing Pathway, Statement 3<br>Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2<br>Transportation, Distribution and Logistics Career Cluster, Statement 3<br>CCSS.ELA-Literacy.W.9-10.2<br>CCSS.ELA-Literacy.W.11-12.2<br>HS-ETS1-2 |
| FPP.03.03.03.c. Propose distribution plans for food products that meet specific market demands. | Team activity | AFNR Career Cluster, Statement 7<br>AFNR Career Cluster – Food Products and Processing Pathway, Statement 3<br>Manufacturing Career Cluster – Logistics and Inventory Control, Pathway 2<br>Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 1 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| | | Manufacturing Career Cluster – Manufacturing Product Process Development Pathway, Statement 2<br>Transportation, Distribution and Logistics Career Cluster, Statement 3<br>CCSS.ELA-Literacy.W.9-10.2<br>CCSS.ELA-Literacy.W.11-12.2<br>HS-ETS1-2 |
| **FPP.04.01. Performance Indicator: Examine the scope of the food industry by evaluating local and global policies, trends and customs for food production.** | | |
| FPP.04.01.01.a. Research and summarize examples of policy and legislation that affect food products and processing systems in the United States and around the world (e.g., labeling, GMOs, biosecurity, etc.). | Objective test | HS-ETS1-3<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 1<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 2 |
| FPP.04.01.02.a. Examine the impact of consumer trends on food products and processing practices (e.g., health and nutrition, organic, information about food products, local food movements, etc.). | Objective test | HS-ETS1-3<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 1<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 2 |
| FPP.04.01.02.b. Construct and implement methods to obtain data on food consumer trends in a specific market. | Team activity | HS-ETS1-3<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 1<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 2 |
| FPP.04.01.02.c. Devise a strategy to create food products that meet a specific consumer trend in a specific market. | Team activity | HS-ETS1-3<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 1<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 2 |
| FPP.04.01.03.a. Compare and contrast cultural differences regarding food products and processing practices. | Objective test | HS-ETS1-3<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 1<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 2 |
| FPP.04.01.03.c. Propose culturally sensitive food processing and distribution practices. | Team activity | HS-ETS1-3<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 1<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 2 |
| **FPP.04.02. Performance Indicator: Evaluate the significance and implications of changes and trends in the food products and processing industry in the local and global food systems.** | | |
| FPP.04.02.01.a. Describe and explain the components of the food products and processing industry (e.g., processing, distribution, byproducts, etc.). | Objective test | Buying Goods and Services, Benchmarks: Grade 12, Statement 1 |
| FPP.04.02.01.b. Analyze and document significant changes and trends in the food products and processing industry. | Objective test | Buying Goods and Services, Benchmarks: Grade 12, Statement 1 |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| FPP.04.02.01.c. Predict and defend upcoming changes and trends in the food products and processing industry. | Team activity | Buying Goods and Services, Benchmarks: Grade 12, Statement 1 |
| FPP.04.02.02.a. Identify and explain environmental and safety concerns about the food supply. | Objective test | Buying Goods and Services, Benchmarks: Grade 12, Statement 1 |
| FPP.04.02.02.c. Examine and respond to consumer concerns about the environment and safety of the food supply using accurate information regarding food products and processing systems and practices. | Food safety and quality practicums | Buying Goods and Services, Benchmarks: Grade 12, Statement 1 |
| FPP.04.02.03.a. Research current and emerging technologies related to food products and processing (e.g., high pressure processing of foods, automation, biotechnology, etc.). | Objective test | Buying Goods and Services, Benchmarks: Grade 12, Statement 1 |
| **FPP.04.03. Performance Indicator: Identify and explain the purpose of industry organizations, groups and regulatory agencies that influence the local and global food systems.** | | |
| FPP.04.03.01.a. Examine and summarize the purposes of organizations that influence or regulate the food products and processing industry. | Objective test | Transportation, Distribution and Logistics Career Cluster – Transportation Systems/Infrastructure Planning, Management and Regulation Pathway, Statement 4<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| FPP.04.03.02.a. Examine the importance and usage of regulatory oversight of food safety and security in food products and processing (e.g., internationally, nationally, state and local). | Objective test | Transportation, Distribution and Logistics Career Cluster – Transportation Systems/Infrastructure Planning, Management and Regulation Pathway, Statement 4<br>Buying Goods and Services, Benchmarks: Grade 12, Statement 7 |
| **CS.01.01. Performance Indicator: Examine issues and trends that impact AFNR systems on local, state, national and global levels.** | | |
| CS.01.01.02.c. Evaluate emerging trends and the opportunities they may create within the AFNR systems. | Team activity | |
| **CS.01.03. Performance Indicator: Identify public policies and their impact on AFNR systems.** | | |
| CS.1.03.02.a. Identify influential historical and current public policies that impact AFNR systems. | Objective test | |
| **CS.02.01. Performance Indicator: Research geographic and economic data related to AFNR systems.** | | |
| CS.02.01.02.b. Analyze a set of economic data and analyze how it impacts an AFNR system. | Math/Problem solving | |
| CS.02.01.02.c. Devise a strategy to solve a problem in an AFNR system using a set of economic data. | Team activity | |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| **CS.02.02. Performance Indicator: Examine the components of the AFNR systems and their impact on the local, state, national and global society and economy.** | | |
| CS.02.02.01.a. Identify and summarize the components within AFNR systems (e.g., Animal Systems: health, nutrition, genetics, etc.; Natural Resources Systems: soil, water, etc.). | Objective test | |
| CS.02.02.02.a. Define and summarize societies on local, state, national and global levels and describe how they relate to AFNR systems. | Objective test | |
| CS.02.02.03.a. Examine and summarize the components of the agricultural economy (e.g., environmental, crops, livestock, etc.). | Objective test | |
| **CS.03.01. Performance Indicator: Identify required regulations to maintain and improve safety, health and environmental management systems.** | | |
| CS.03.01.01.a. Research regulatory, safety and health standards (e.g., SDS, bioterrorism, etc.) | Objective test | |
| CS.03.01.01.b. Assess health, safety and environmental procedures to comply with regulatory and safety standards. | Food safety and quality practicums<br>Objective test<br>Team activity | |
| CS.03.01.02.a. Summarize the importance of safety, health and environmental management in the workplace. | Objective test | |
| CS.03.01.02.c. Construct and implement methods to evaluate compliance with required safety, health and environmental management regulations. | Food safety and quality practicums<br>Objective test | |
| **CS.03.03. Performance Indicator: Apply health and safety practices to AFNR worksites.** | | |
| CS.03.03.01.c. Create a health and safety policy plan for AFNR business. | Team activity | |
| **CS.03.04. Performance Indicator: Use appropriate protective equipment and demonstrate safe and proper use of AFNR tools and equipment.** | | |
| CS.03.04.02.a. Identify standard tools, equipment and safety procedures related to AFNR tasks. | Objective test | |
| CS.03.04.03.b. Assess and demonstrate appropriate operation, storage and maintenance techniques for AFNR tools and equipment. | Food safety and quality practicums | |
| **CS.05.01. Performance Indicator: Evaluate the steps and requirements to pursue a career opportunity in each of the AFNR career pathways (e.g., goals, degrees, certifications, resumes, cover letter, portfolios, interviews, etc.).** | | |
| CS.05.01.01.a. Identify and summarize the steps to pursue a career in an AFNR pathway (e.g., self-assessment, set goals, etc.). | Objective test | |
| **CRP.02.01. Performance Indicator: Use strategic thinking to connect and apply academic learning, knowledge and skills to solve problems in the workplace and community.** | | |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| CRP.02.01.01.c. Apply academic knowledge and skills to solve problems in the workplace and reflect upon the results achieved. | Food safety and quality practicums<br>Math/Problem solving<br>Team activity | |
| **CRP.02.02. Performance Indicator: Use strategic thinking to connect and apply technical concepts to solve problems in the workplace and community.** | | |
| CRP.02.02.01.c. Apply technical concepts to solve problems in the workplace and reflect upon the results achieved. | Food safety and quality practicums<br>Math/Problem solving<br>Objective test<br>Team activity | |
| **CRP.04.02. Performance Indicator: Produce clear, reasoned and coherent written communication in formal and informal settings.** | | |
| CRP.04.02.02.b. Apply techniques for ensuring clarity, logic and coherence to edit written communications (e.g., emails, reports, presentations, technical documents, etc.). | Team activity | |
| CRP.04.02.02.c. Compose clear and coherent written documents (e.g., agendas, audio-visuals, drafts, forms, etc.) for formal and informal settings. | Team activity | |
| **CRP.04.03. Performance Indicator: Model active listening strategies when interacting with others in formal and informal settings.** | | |
| CRP.04.03.01.b. Apply active listening strategies (e.g., be attentive, observe non-verbal cues, ask clarifying questions, etc.). | Food safety and quality practicums | |
| **CRP.05.01. Performance Indicator: Assess, identify and synthesize the information and resources needed to make decisions that positively impact the workplace and community.** | | |
| CRP.05.01.03.c. Synthesize information and resources and apply to workplace and community situations to make positive decisions. | Food safety and quality practicums<br>Team activity | |
| **CRP.05.02. Performance Indicator: Make, defend and evaluate decisions at work and in the community using information about the potential environmental, social and economic impacts.** | | |
| CRP.05.02.01.c. Evaluate and defend decisions applied in the workplace and community situations. | Team activity | |
| **CRP.06.01. Performance Indicator: Synthesize information, knowledge and experience to generate original ideas and challenge assumptions in the workplace and community.** | | |
| CRP.06.01.01.c. Evaluate workplace and community situations and devise strategies to apply original ideas. | Team activity | |
| **CRP.06.03. Performance Indicator: Create and execute a plan of action to act upon new ideas and introduce innovations to workplace and community organizations.** | | |
| CRP.06.03.01.c. Design a plan of action to introduce a new idea or innovation into the workplace and community. | Team activity | |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| CRP.06.03.02.c. Evaluate and execute strategies for using stakeholder input and feedback to improve a plan of action for introducing a new idea or innovation into the workplace or community. | Team activity | |
| **CRP.07.01. Performance Indicator: Select and implement reliable research processes and methods to generate data for decision-making in the workplace and community.** | | |
| CRP.07.01.01.a. Identify and summarize reliable research processes and methods used to generate data for decision-making. | Team activity | |
| **CRP.08.01. Performance Indicator: Apply reason and logic to evaluate workplace and community situations from multiple perspectives.** | | |
| CRP.08.01.01.b. Apply steps for critical thinking to a variety of workplace and community situations. | Food safety and quality practicums<br>Math/Problem solving<br>Sensory evaluation practicums<br>Team activity | |
| **CRP.09.03. Performance Indicator: Demonstrate behaviors that contribute to a positive morale and culture in the workplace and community (e.g., positively influencing others, effectively communicating, etc.).** | | |
| CRP.09.03.02.c. Model respectful and purposeful behaviors that contribute to positive morale and culture in the workplace and community (e.g., effectively communicating, recognizing accomplishments of others, etc.). | Team activity | |
| **CRP.10.02. Performance Indicator: Examine career advancement requirements (e.g., education, certification, training, etc.) and create goals for continuous growth in a chosen career.** | | |
| CRP.10.02.01.a. Categorize career advancement requirements for potential careers (e.g., degrees, certification, training, etc.). | Objective test | |
| **CRP.11.01. Performance Indicator: Research, select and use new technologies, tools and applications to maximize productivity in the workplace and community.** | | |
| CRP.11.01.01.c. Construct effective communications to explain the features, benefits and risks of new technologies, tools and applications in the workplace and community. | Team activity | |
| CRP.11.01.02.b. Select, apply and use new technologies, tools and applications in workplace and community situations to maximize productivity. | Team activity | |
| **CRP.11.02. Performance Indicator: Evaluate personal and organizational risks of technology use and take actions to prevent or minimize risks in the workplace and community.** | | |
| CRP.11.02.02.a. Synthesize tools and processes to prevent or minimize risks of technology use in community and work settings (e.g., risk management tools, benefit risks, etc.). | Food safety and quality practicums<br>Team activity | |

| Measurements Assessed | Event Activities Addressing Measurements | Related Academic Standards |
|---|---|---|
| **CRP.12.01. Performance Indicator: Contribute to team-oriented projects and build consensus to accomplish results using cultural global competence in the workplace and community.** | | |
| CRP.12.01.02.b. Apply consensus building techniques to accomplish results in team-oriented situations. | Food safety and quality practicums<br>Team activity | |
| **CRP.12.02. Performance Indicator: Create and implement strategies to engage team members to work toward team and organizational goals in a variety of workplace and community situations (e.g., meetings, presentations, etc.).** | | |
| CRP.12.02.01.b. Assess team dynamics and match strategies to increase team member engagement. | Food safety and quality practicums<br>Team activity | |