south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

CTE Standards Unpacking
Introduction to AFNR (Agriscience)

Course: Introduction to AFNR (Agriscience)
Course Description: This course allows students to study a variety of agricultural topics throughout the six Agriculture, Food, and Natural Resources pathways. It serves as an introduction to much of the coursework included within the AFNR cluster. Application of clinical and leadership skills are provided by participating in FFA activities, conferences, and skills competitions such as the Career Development Events and proficiency awards. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Algebra, biology, English and human relations skills will be reinforced in the course. Each student will be expected to maintain a Supervised Agricultural Experience (SAE).
Career Cluster: Agriculture, Food and Natural Resources
Prerequisites: None
Program of Study Application: Introduction to Agriculture, Food & Natural Resources is a cluster course in the Agriculture, Food and Natural Resources cluster. Introduction to Agriculture, Food & Natural Resources would be preceded by a Foundation Course, and would prepare a student to take a first-level course in any of the Agriculture, Food and Natural Resources pathways.

<table>
<tr><td colspan="3">INDICATOR #ITA 1: Examine the role of FFA in agricultural education programs.</td></tr>
<tr><td colspan="3">SUB-INDICATOR 1.1 (Webb Level: 1 Recall): Summarize the history and organization of FFA.</td></tr>
<tr><td colspan="3">SUB-INDICATOR 1.2 (Webb Level: 1 Recall): Explore opportunities in FFA.</td></tr>
<tr><td colspan="3">SUB-INDICATOR 1.2 (Webb Level: 2 Skill/Concept): Demonstrate proper use of parliamentary procedure.</td></tr>
<tr><td>Knowledge (Factual):
-Know how, when and why FFA was organized

-Mission and strategies, colors, motto, parts of the emblem and the organizational structure of FFA

-FFA proficiency award areas

-Parliamentary</td><td>Understand (Conceptual):
-Develop an understanding of a program of activities for the local chapter and organization

-Understand the differences between the five FFA Degrees

-Foster formal communication skills</td><td>Do (Application):
-Revise a program of activities for the local chapter

-Explore a local, state or national Career Development Event

-Debate on a topic related to agriculture

-Chair a mock business meeting</td></tr>
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procedure skills through motions, amendments, votes, etc.		

Benchmarks:
Students will be assessed on their ability to:

- Create a timeline depicting the history of the FFA organization.
- Recite and explain the meaning of the FFA Creed.
- Compete at a local, state or national Career Development Event.
- Complete proficiency application(s).
- Prepare an agenda for an FFA meeting.
- Compose the minutes of an FFA meeting.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
English: 1) 9-12.W.6 - Using technology to research	-Research five proficiency areas and SAE project ideas using information from FFA.org
2) 9-12.SL.1 - Collaborative discussion	-Interactively debate a main motion in a parliamentary procedure demonstration.
3) 9-12.SL.2 - Presenting information	-Recite and explain the meaning of the FFA Creed.

INDICATOR #ITA 2: **Describe the types of Supervised Agricultural Experiences.**

SUB-INDICATOR 2.1 (Webb Level: 1 Recall): Evaluate the benefits and types of SAE programs.

SUB-INDICATOR 2.2 (Webb Level: 3 Strategic Thinking): Develop a profile within Ag Career Network or Ag Experience Tracker.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Define and describe various SAE programs	-The benefits of SAE opportunities for students and for the host of the experience	-Implement a SAE -Complete the career finder application within

		Ag Explorer to identify potential career paths

Benchmarks:
Students will be assessed on their ability to:

- Explain the characteristics of a proficient SAE program and entailed responsibilities.
- Complete an Ag Experience Tracker profile.
- Begin record keeping with SD record books or AET.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
English: 9-12.W.2 - Informative writing	-Present SAE record book
Math: HSS.IC.B.6 - Evaluate reports based on data.	-Analyze profit and loss to make management decisions.

INDICATOR #ITA 3: **Discuss the concept of natural resources.**

SUB-INDICATOR 3.1 (Webb Level: 2 Skill/Concept): Classify different types of natural resources in order to enable protection, conservation, enhancement, and management in a particular geographical region.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Define local natural resources -Summarize those individuals instrumental to the field of natural resources and their accomplishments -Identify natural resources as renewable or non-renewable	-Understand how natural resources affect our ecosystem	-Analyze exploitation, conservation and preservation as they relate to natural resources management -Critique the role(s) of the federal government in natural resource legislation

Benchmarks:
Students will be assessed on their ability to:

- Compete in the Natural Resources Career Development Event.
- Compete in Land and/or Range Judging.
- Complete an Environmental Services/Natural Resource Systems at the National FFA Agriscience Fair.
- Create a presentation focused on a natural resource topic.

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
Math: 1) MG.A.2 - Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).	-Calculate the carrying capacity of a habitat.
English: 1) 9-12.W.1 - Writing arguments to support claims	-Critique the role(s) of the federal government in natural resource legislation.
2) 9-12.SL.2 - Integrating multiple sources.	-Researching individuals who are instrumental to the field of natural resources.

INDICATOR #ITA 4: **Describe the animal science industry.**		
SUB-INDICATOR 4.1 (Webb Level: 1 Recall): Examine the animal science industry.		
SUB-INDICATOR 4.2 (Webb Level: 2 Skill/Concept): Analyze historic and current trends impacting the animal science industry.		
Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Classify the common breeds of animals in each species -Define livestock terminology -Identify past, present, and future trends in the animal science industry	-Understand how animal product prices are affected by federal price supports and marketing orders	-Select animals for production or use of each species -Presents ways animals benefit people -Debate ethics, welfare, and rights involved in animal production -Debate the use of animals used for genetic

		engineering and biotechnology -Practice safe handling with livestock

Benchmarks:
Students will be assessed on their ability to:

- Illustrate types of animal production setups and facility needs of various animals.
- Compete in General Livestock, Dairy Cattle, or Horse Judging Career Development Events.

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
English: 1) 9-12 SL.4 - Presenting information	-Create a presentation on animal uses or different livestock breeds among species.
2) 9-12 SL.1 - Participate in collaborative discussion	-Debate on an animal production related topic.

INDICATOR #ITA 5: **Describe plant structure and function.**		
SUB-INDICATOR 5.1 (Webb Level: 1 Recall): Examine the plant science industry.		
SUB-INDICATOR 5.2 (Webb Level: 2 Skill/Concept): Analyze historic and current trends impacting the plant science industry.		
Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Identify plant structures -Describe physiological functions of plants -Describe germination process and condition -Explore past, present, and future trends in the plant science industry	-Understand the environmental factors that influence and optimize plant growth -Understand plant classification systems -Understand how consumers needs and demands impact the	-Manipulate and evaluate environmental conditions -Dissect monocots or dicots plants, using a dichotomous key to identify -Complete methods of asexual/sexual plant propagation

-Identify plants for genetic engineering and biotechnology	industry	-Prepare soil/media for planting

Benchmarks:
Students will be assessed on their ability to:

- Select plants to be used in a genetic engineering and biotechnology experiment.
- Compete in Land and/or Range Contest.
- Compete in Range Plant ID.
- Plant Systems Agriscience Project on the National Level.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
Science: 1) HS-LS1-5 – Photosynthesis	-Conduct an experiment that manipulates optimal plant growing conditions.

INDICATOR #ITA 6: **Summarize basic economic principles.**

SUB-INDICATOR 6.1 (Webb Level: 2 Skill/Concept): Apply management planning principles in the AFNR business.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Identify basic economic principles, such as the business cycle, supply, and demand	-Interpret the importance of keeping accurate records for an agriculture related business -The impact of supply and demand on prices and the planning necessary to appropriately respond to market fluctuations	-Calculate books for an agriculture related business -Calculate net and gross income for tax purposes

Benchmarks:
Students will be assessed on their ability to:

- Complete basic SAE records.

- Track income and expenses from a fundraiser.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
Social Studies: 1) K-12 E.1 - Students will apply the fundamental economic ideas and concepts associated with the study of economics.	-Determine the supply and demand of the service you offer or provide.
Math: 1) HSF.BF.A.1.A - Determine... steps for calculation from a context.	-Calculate your net worth within your record book that is based from your Supervised Agriculture Experience Project.
2) HSS.ID.A.2 - Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	-Analyzing data from Agriscience projects.

INDICATOR #ITA 7: **Discuss basic food science technology.**

SUB-INDICATOR 7.1 (Webb Level: 1 Recall): Illustrate how raw commodities become table-ready food products.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Define safe food handling practices	-Understand how a variety of foods are processed from farm to table	-Implement safe food handling practices -Practice food processing and preservation techniques and procedures -Design marketing and advertising of agricultural products

Benchmarks:
Students will be assessed on their ability to:

- Create and analyze a food product for quality.
- Compete in the Food Science Technology, Milk Quality and Products, and Meat Technology Career and Development Event
- Map a commodity from farm to table.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**
English: 9-12 SL.2 – Integrating multiple sources of information to create diverse presentations.	-Present a marketing plan advertising an agricultural product.

INDICATOR #ITA 8: **Use basic principles of agricultural systems technology.**

SUB-INDICATOR 8.1 (Webb Level: 2 Skill/Concept): Execute basic principles involved in agricultural systems technology.

Knowledge (Factual):	**Understand (Conceptual):**	**Do (Application):**
-Define what constitutes an agricultural technology system -Identify tools	-Demonstrate safe use of tools and equipment -Use measuring tools with accuracy	-Use tools for given purposes -Design a bill of materials for a selected project

Benchmarks:
Students will be assessed on their ability to:

- Construct a project.
- Compete in the Agriculture Mechanics Career Development Event.
- Complete a project within the Power, Structural, and Technical National Agriscience.

Academic Connections

ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard):	**Sample Performance Task Aligned to the Academic Standard(s):**

Math: HSN.Q.A.3 - Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	-Complete a metal or wood project using accurate geometric methods of measurement.

INDICATOR #ITA 9: **Develop employability skills related to the AFNR cluster.**		
SUB-INDICATOR 9.1 (Webb Level: 2 Skill/Concept): Develop soft skills to enhance employability.		
Knowledge (Factual): -Identify Agriculture, Food, and Natural Resource careers	**Understand (Conceptual):** -Understand AFNR Career pathways -Understand AFNR career educational requirements	**Do (Application):** -Plan and execute a task (develop food science industry business plan, food product, etc.) -Compose a cover letter, resume, and follow-up letter
Benchmarks: *Students will be assessed on their ability to:* • Participate in a Career Development Event.		

Academic Connections	
ELA Literacy and/or Math Standard (if applicable, Science and/or Social Studies Standard): English: 9-12 W.2 – Write to inform	**Sample Performance Task Aligned to the Academic Standard(s):** -Write a cover letter, resume, and follow-up letter.

Additional Resources

- FFA Student Handbook
- FFA Official Manual
- FFA.org
  - Under Educator Resources, FFA section
  - Under Chapter Resource tab
  - Under Awards tab (Proficiency Awards)
  - Under Educator Resources, Supervised Agricultural Experience section
- Youtube Videos : FFA National Proficiency Award Winners

- Youtube Videos: SAE Experience It!
- My Journey Curriculum through National FFA Organization: https://www.ffa.org/my-journey
- Robert's Rule of Order
- Parliamentary Procedure Made Easy textbook
- Cengage-Leadership: Personal Development and Career Success textbook
- Communities of Practice: FFA (https://communities.naae.org/community/ffa)
- Agexplorer.com
- SAE Ideas button on each pathway webpage
- The AET: http://www.theaet.com/
- SAE Ideas Card Set (FFA Store)
- My Journey Curriculum through National FFA Organization: https://www.ffa.org/my-journey
- National FFA Proficiency Handbook: https://www.ffa.org/sitecollectiondocuments/prof_handbook.pdf
- Communities of Practice: Experiential Learning (SAE): https://communities.naae.org/community/experiential-learning
- Renewable Fuels Lesson Plans and Student Module Course (Educator Resources through National FFA Organization)
- Delmar Management Our Natural Resources textbook
- MyCAERT Curriculum
- Theodore Roosevelt: Conserving America's Future Youtube Video
- Communities of Practice: Natural Resources: https://communities.naae.org/community/instruction/naturalresources
- Curriculum for Agricultural Science Education: Natural Resources and Ecology
- Natural Resource lessons (Middle School Food and Agricultural Literacy Curriculum: Educators Resources in ffa.org)
- Communities of Practice: Natural Resources: https://communities.naae.org/community/instruction/naturalresources
- Communities of Practice: Animal Science: https://communities.naae.org/community/instruction/animalscience
- Animal Science lessons (Middle School Food and Agricultural Literacy Curriculum: Educators Resources in ffa.org)
- Curriculum for Agricultural Science Education: Principles of Agricultural Science-Animal
- Curriculum for Agricultural Science Education: Animal and Plant Biotechnology
- Introduction to Biotechnology: An Agricultural Revolution by Ray V. Herren (Thomson-Delmar Learning)
- Plant Science lessons (Middle School Food and Agricultural Literacy Curriculum: Educators Resources in ffa.org)
- Agricultural Science and Technology lessons (Middle School Food and Agricultural Literacy Curriculum: Educators Resources in ffa.org)
- Cengage Introduction to Agronomy, Food, Crops, and Environment textbook

- Plant & Soil Science: Fundamentals and Applications by Rick Parker (Delmar Cengage Learning)
- Principles of Agriculture, Food, and Natural Resources by Rayfield, Smith, Park, and Croom (Goodheart-Wilcox Publisher)
- Curriculum for Agricultural Science Education: Principles of Agricultural Science-Plant
- Curriculum for Agricultural Science Education: Animal and Plant Biotechnology
- Unleashing a Decade of Innovation in Plant Science: A Vision for 2015-2025 (www.plantsummit.files.wordpress.com)
- South Dakota Soybean Interactive Curriculum: http://www.vivayicsolutions.com/063-SDSoy&PC/16-01SoyInteractive/Gold/story_html5.html
- Communities of Practice: Horticulture/Greenhouse Management (https://communities.naae.org/community/instruction/horticulture)
- Communities of Practice: Floral Design (https://communities.naae.org/community/instruction/floraldesign)
- Communities of Practice: Ag. Economics: https://communities.naae.org/community/instruction/econ
- Agricultural Risk Management Instructional Materials (Educator Resources through National FFA Organization)
- AgriEntrepreneurship (Educator Resources through National FFA Organization)
- Financial Planning and Management (Educator Resources through National FFA Organization)
- Agricultural Issues lessons (Middle School Food and Agricultural Literacy Curriculum: Educators Resources in ffa.org)
- Farm and Ranch Business Management Book (Shop ffa.org)
- Farm and Ranch Business Management Student Guide (Shop ffa.org)
- Cengage Agribusiness Fundamentals and Applications textbook
- Communities of Practice: Ag. Economics (https://communities.naae.org/community/instruction/econ)
- ServSafe Food Handler Certification Training
- Delmar *Introduction to Food Science* textbook
- Communities of Practice-Food Science: https://communities.naae.org/community/instruction/agriscience/foodscience
- Dairy Foods Curriculum by Sheri L. Kahnke and Dr. Robert Baer
- Food Safety and Nutrition Education Curriculum: http://www.teachfoodscience.org/curriculum.asp
- Food Science for Kids of All Ages!: Resources for Teachers: http://foodscience.psu.edu/youth/educators
- Curriculum of Agricultural Science Education Food Science and Safety
- Institute Food Technologists: http://www.ift.org/knowledge-center/learn-about-food-science/k12-outreach.aspx
- Food Safety Scientist: http://igrow.org/healthy-families/food-safety/food-safety-scientist/

- Introduction to Food Science Curriculum (Educator Resources through National FFA Organization)
- Food Science lessons (Middle School Food and Agricultural Literacy Curriculum: Educators Resources in ffa.org)
- Food Products and Processing Systems National FFA Agriscience Fair Project
- Welding Connects Your World (Educator Resources through National FFA Organization)
- Curriculum for Agricultural Science Education: Agricultural Power and Technology
- Communities of Practice-Ag Mechanics: https://communities.naae.org/community/instruction/mechanics
- Introduction to Agricultural Science lessons (Middle School Food and Agricultural Literacy Curriculum: Educators Resources in ffa.org)
- Careers in Agricultural Science (Middle School Food and Agricultural Literacy Curriculum: Educators Resources in ffa.org)
- LifeKnowledge lessons (Educators Resources in ffa.org)
- Today's Challenges; Today's Leaders: Focusing on Diversity, Hunger, Advocacy and Sustainability (Educators Resources in ffa.org)
- Professional Growth Handbook (Educators Resources in ffa.org)
- Communities of Practice-Ag. Communications/Leadership: https://communities.naae.org/community/instruction/agcomm
- Cengage-Leadership: Personal Development and Career Success textbook