# Food Science
# 18305

**Rationale Statement**:

The state of South Dakota is diverse in the agriculture products it produces and the value added food products available to the consumer. Food Science is a course designed to provide students with an overview of food science and its importance to producers and consumers. Classroom and laboratory content may be enhanced by utilizing appropriate equipment and technology. Mathematics, science, English and human relations skills will be reinforced in the course. Work-based learning strategies appropriate for this course are school-based enterprises, field trips and internships. Opportunities for application of clinical and leadership skills are provided by participation in FFA through activities, conferences and skills competitions such as Food Science, Meats Evaluation and Dairy Foods. Each student will be expected to complete a Supervised Agricultural Experience program or internship.

**Suggested grade level: $9^{th}$ – $12^{th}$**

**Topics covered:**

- Changes and trends in the food industry
- Food industry organizations and regulatory agencies
- Safe and sanitary handling procedures
- Food nutrition
- Food constituents
- Food additives
- Labeling
- Market testing

| Indicator #1: Examine the makeup of the food industry. | |
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| **Bloom's Taxonomy Level** | **Standard and Examples** |
| Analyzing | **FS 1.1 Differentiate the evolution of the food industry.**<br><br>Examples:<br>• Distinguish the components (processing, distribution, byproducts) of the food industry.<br>• Appraise changes in the food industry.<br>• Contrast trends in the food industry. |
| Understanding | **FS 1.2 Identify industry organizations and their impact on the food industry.**<br><br>Examples:<br>• Discuss industry organizations and their purposes.<br>• Describe the purposes of organizations that regulate the food industry.<br>• Explain the changes in the food industry brought about by industry organizations or regulatory agencies. |
| **Indicator #2: Apply safety and sanitation procedures for food products.** | |
| **Bloom's Taxonomy Level** | **Standard and Examples** |
| Understanding | **FS 2.1 Describe proper safety and sanitation practices when working with food products.**<br><br>Examples:<br>• Explain techniques for handling food products safely.<br>• Describe the importance of performing quality-assurance tests on food products.<br>• Discuss the effects food-borne pathogens have on food and humans.<br>• Explain the importance of record keeping in the food industry. |

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| Applying | **FS 2.2 Apply safety and sanitation practices used in the food industry.**<br><br>Examples:<br>• Distinguish safe food product handling procedures.<br>• Employ quality-assurance tests on food products.<br>• Interpret the importance of microbiological tests in food product preparation, including common spoilage and pathogenic microorganisms.<br>• Illustrate documentation procedures in the food industry. |
| **Indicator #3: Apply the principles of science to producing safe, wholesome and nutritious food products.** | |
| **Bloom's Taxonomy Level** | **Standard and Examples** |
| Understanding | **FS 3.1 Explain the application of chemistry and physics to food science.**<br><br>Examples:<br>• Identify how the chemical and physical properties of foods influence nutritional value and eating quality.<br>• Discuss common food constituents (proteins, carbohydrates, fats, vitamins, minerals).<br>• Identify common food additives (preservatives, antioxidants, buffers, stabilizers, colors, flavors). |
| Analyzing | **FS 3.2 Differentiate the makeup of food products.**<br><br>Examples:<br>• Distinguish the chemical and physical properties of food products.<br>• Compare and contrast the nutritive value of food and food groups.<br>• Compare and contrast food constituents and their relative value to product taste, appearance, etc.<br>• Analyze food products to identify food constituents.<br>• Examine the purpose of common food additives. |

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| Creating | **FS 3.3 Construct a food product that meets the standards of regulatory agencies.**<br><br>Examples:<br>• Report on the importance of food labeling to consumers.<br>• Design a food label with the correct components.<br>• Construct a new food product.<br>• Formulate sensory-testing and marketing functions to characterize consumer preference and market potential. |