

Food Science and Technology

Instructional Framework

An instructional framework provides educators with a list of benchmark statements aligned to Common Core and national content area standards for a given course or program. The Missouri Food Science and Technology Instructional Framework lists a sequence of content, organized into distinct units of instruction. Sample activities and potential Common Core related enhancements are provided.

	Common Core Standards	National Standards (AFNR)	Activities (already in the Curriculum)	Enhancements (if done, would add an additional standard)
A. Principles of Food Preservation				
1. Describe factors related to food preservation	N-Q.1 RST.11-12.3		Experiments in <ul style="list-style-type: none"> • Effects of packing Material in maintaining Meat Quality • Effects of Light Quality on Food Flavor • Visiting a grocery store to measure coolers for temp. 	WHST.11-12.2 if you have the student summarize their information and findings into a report/paper. N-Q.1 Curing a Ham
2. Describe factors that contribute to food deterioration	N-Q.1 RST.11-12.3		Experiments in <ul style="list-style-type: none"> • Osmosis and Diffusion Across a Semi-Permeable Membrane • Bacteria are found Everywhere 	WHST.11-12.2 if you have the student summarize their information and findings into a report/paper.

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UNIT: Demonstrate an understanding of food preservation by researching food preservation techniques and presenting their findings to the class in an oral report.				
B. Food Processing				
1. Explain procedures used to process food safely	RST.11-12.3 RST.11-12.4 N-Q.1		Experiments in <ul style="list-style-type: none"> Dehydration and Rehydration Define Food Processing Key Terms	G-GMD.3 If the students in the fruit rehydration activity, measure the fruit for l x w x h and figure volume
2. Describe the complexity of development of food products	N-Q.1 RST.11-12.3		Experiments in <ul style="list-style-type: none"> Soy Milk 	
3. Identify products produced from different grades of raw milk	RST.11-12.3 RST.11-12.9 N-Q.1		Experiments in <ul style="list-style-type: none"> Determining Thresholds for Off Flavors of Milk 	
4. Summarize how dairy products are processed and packaged	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> Pasteurization in a Double Boiler Making Yogurt 	WHST.11-12.2 if you have the student summarize their information and findings into a report/paper. RST.11-12.4, RST.11-12.9, N-Q.1, N-Q.2, A.SSE.2, Participate in the Dairy Foods CDE/TSA
5. Compare egg processing techniques to egg products			Experiments in <ul style="list-style-type: none"> Candling Eggs 	RST.11-12.3 and N-Q.1 Cook using eggs where students must follow a recipe RST.11-12.4, RST.11-12.9, N-Q.1, N-Q.2 Participate in the Poultry CDE/TSA

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6. List the products and by-products from meat animals	RST.11-12.9 N-Q.1		Experiments in <ul style="list-style-type: none"> • Cutting Up a Chicken • Making Bratwurst 	RST.11-12.4, RST.11-12.9, N-Q.1, N-Q.2, A.SSE.2, Participate in the Meats CDE/TSA
7. Describe the processing of meat animals	RST.11-12.4		Defining Food Processing Terminology	
8. Explain the relationship between quality grades, inspections, and brand names in the meat industry				
9. Identify the products of grain crops	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> • Soybean Processing Identifying Corn Sweeteners 	
10. Explain the processing of grain crops	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> • Processing Wheat into Flour 	
11. Identify fruit, vegetable, and nut products and factors that determine quality	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> • Making Nut Butter • Making Grape Juice 	
12. Explain how fruits, vegetables, and nuts are processed	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> • Enzymatic Browning 	
UNIT: Demonstrate an understanding of the food processing industry by creating and describing a food product, in outline form, that will appeal to today's consumers and designing the packaging materials to effectively market the product.				

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C. The Biochemistry of Foods				
1. Identify the factors that affect food safety and quality	RST.11-12.3 RST.11-12.7 RST.11-12.9 WHST.11-12.8 WHST.11-12.9 N-Q.1		Experiments in <ul style="list-style-type: none"> Nitrites in Meat Food Safety and Issues Research Project	WHST.11-12.2 if you have the student summarize their information and findings into a report/paper. SL.11-12.4 if you have the students present their reports on food safety and issues orally
2. Describe problems resulting from food deterioration	RST.11-12.4		Defining Food Deterioration Terminology	
3. Describe the nutritional properties of foods	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> Identifying basic food nutrients Meal Planning 	WHST.11-12.2 if you have the student summarize their information and findings into a report/paper.
4. Describe how processing techniques influence the nutritional value of food	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> How Processing Affects Vitamin C 	RST.11-12.9, SL.11-12.4, W.11-12.4 Create a new food item, develop the packaging, market the product, and find similar products to compare. Students should showcase their new products to the class. SL.11-12.5 – if the student develops a commercial for their new product.
5. Describe the role of biotechnology in the food industry	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> A Bioengineer Food Product 	

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UNIT: Demonstrate an understanding of biochemistry of foods by creating a poster about a commodity, product, or application that has been created or made better by the influence of biochemistry and giving an oral report to the class based on their poster.				N-Q.1, W.11-12.4, SL.11-12.4, RST.11-12.9, S-IC.1 Have students create a project where they conduct a taste-test for products comparing a selected number of criteria. Create a poster with graphs, results, predictions, and procedure. Students should showcase findings.
D. Food Selection and Consumer Health				
1. Describe the factors that affect consumer choices of food	RST.11-12.3 RST.11-12.4 RST.11-12.9 N-Q.1		Experiments in <ul style="list-style-type: none"> Comparing Snack Food Items 	
2. Interpret a food label	RST.11-12.4 N-Q.1		Experiments in <ul style="list-style-type: none"> Interpreting Food Labels 	
3. Compare the nutritional value of beverages	RST.11-12.3 N-Q.1		Experiments in <ul style="list-style-type: none"> Test for Vitamin C 	
4. Describe the relationship between diet and health				
UNIT: Demonstrate an understanding of the nutritional facts on food labels and the nutritional requirements of a healthy diet by creating a chart where they will keep track of the foods they consume and writing a summary of their results				

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E. Leadership and Personal Development for Advanced Students				
1. Develop a resume and complete a job application	L.11-12.1 L.11-12.2 W.11-12.10		<ul style="list-style-type: none"> • Develop a Resume • Complete Sample Job Application 	
2. Develop a plan for finding a job	W.11-12.4		<ul style="list-style-type: none"> • Take a Career Interest Survey • Write a cover letter 	
3. Describe how to apply and interview for a job	SL.11-12.6		<ul style="list-style-type: none"> • Conduct Sample Job Interviews 	
4. Describe the characteristics needed to develop desirable personal and social skills	SL.11-12.1		<ul style="list-style-type: none"> • Verbal and Nonverbal Communication • Role Playing 	
5. Describe the importance and process of developing better human relationships	SL.11-12.1		<ul style="list-style-type: none"> • Role Playing • Group Discussion 	Community Service Project
UNIT: Explore a career area by investigating entry-level job opportunities at a local agricultural business and writing a résumé and letter of application for a position.				
F. Using the <i>Missouri Agricultural Record Book for Secondary Students</i>				
1. Complete forms needed to open the Missouri Agricultural Record Book for Secondary Students			Form 100/101 (SAE Enterprises/Agreement)	
2. Complete a budget for the SAE program	N-Q.1		Complete Form 103 (Budget)	

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3. Complete inventory and financial statement forms for the Missouri Agricultural Record Book for Secondary Students	N-Q.1		Complete Forms 6, 7, 8, 9, 10, 11, 12 (Financials)	
4. Complete receipt and expenditure forms in the Missouri Agricultural Record Book for Secondary Students	N-Q.1		Forms 1, 2, 3, 4, 5 (Income, Expenses, Cash Flow)	
5. Complete additional forms in the Missouri Agricultural Record Book for Secondary Students	N-Q.1		Supplemental (102, 104, 105, 106, 107) Leadership Pages (108, 109, 110, 111) Directed Lab Community Service Hours Log	
UNIT: Demonstrate the ability to use selected forms in the <i>Missouri Agricultural Record Book for Secondary Students</i> by using a list of sample entries to complete the applicable forms in the book.				

Codes for Common Core Mathematics are:

- N = Number and Quantity
- A = Algebra
- F = Functions
- G = Geometry
- S = Statistics and Probability

Codes for Common Core English Language Arts and Literacy are:

- RL = Reading for Literature
- RI = Reading for Informational Text
- RST = Reading for Literacy in Science and Technical Subjects
- RH = Reading for Literacy in History/Social Studies
- W = Writing
- WHST = Writing for Literacy in History/Social Studies, Science, and Technical Subjects
- SL = Speaking and Listening
- L = Language