

# Food Science

## At-A-Glance - Lamar CISD

<b>Ongoing Skills Imbedded All Year</b>	<b>Professional Standards/Employability Skills/Technical Skills</b>		
	<b>Professional Skills &amp; Scientific</b> FS 1(A) The student will apply interpersonal communication skills in business and industry settings. FS 1(B) The student will explain and recognize the value of collaboration within the workplace. FS 1(C) The student will examine the importance of time management to succeed in the workforce. FS 1(D) The student will identify work ethics/professionalism in a job setting. FS 1(E) The student will develop problem-solving and critical-thinking skills. FS 4(A) The student will in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student. FS 4(B) The student will communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials. FS 4(C) The student will draw inferences based on data related to promotional materials for products and services. FS 4(D) The student will evaluate the impact of scientific research on society and the environment. FS 4(E) The student will evaluate models according to their limitations in representing biological objects or events. FS 4(F) The student will research and describe the history of biology and contributions of scientists.		
<b>Grading Period</b>	<b>Unit Name</b>	<b>Estimated Time Frame</b>	<b>TEKS</b>
<b>Grading Period 1 28 Days</b>	<b>Professional Skills &amp; Scientific</b>	<b>7 Days</b>	1.A, 1.B, 1.C, 1.D, 1.E, 4.A, 4.B, 4.C, 4.D, 4.E, 4.F
	<b>Professional Skills &amp; Scientific</b> FS 1(A) The student will apply interpersonal communication skills in business and industry settings. FS 1(B) The student will explain and recognize the value of collaboration within the workplace. FS 1(C) The student will examine the importance of time management to succeed in the workforce. FS 1(D) The student will identify work ethics/professionalism in a job setting. FS 1(E) The student will develop problem-solving and critical-thinking skills. FS 4(A) The student will in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student. FS 4(B) The student will communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials. FS 4(C) The student will draw inferences based on data related to promotional materials for products and services. FS 4(D) The student will evaluate the impact of scientific research on society and the environment. FS 4(E) The student will evaluate models according to their limitations in representing biological objects or events. FS 4(F) The student will research and describe the history of biology and contributions of scientists.		
	<b>Orientation</b>	<b>5 Days</b>	2.A
	FS 2(A) The student will demonstrate safe practices during laboratory and field investigations.		
	<b>History of Food Science</b>	<b>7 Days</b>	4.F
	FS 4(F) The student will research and describe the history of biology and contributions of scientists.		
	<b>Scientific Inquiry &amp; Lab Equipment &amp; Procedures</b>	<b>2 Days</b>	2.B, 3.A, 3.B, 4.A, 4.B, 4.C, 4.D, 4.E
	FS 2(B) The student will demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials. FS 3(A) The student will know the definition of science and understand that it has limitations, as specified in subsection (b)(4) of this section. FS 3(B) The student will know that hypotheses are tentative and testable statements that must be capable of being supported or not supported by observational evidence. Hypotheses of durable explanatory power that have been tested over a wide variety of conditions are incorporated into theories. FS 4(A) The student will in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student. FS 4(B) The student will communicate and apply scientific information extracted from various sources such as current events, news reports, published journal articles, and marketing materials. FS 4(C) The student will draw inferences based on data related to promotional materials for products and services. FS 4(D) The student will evaluate the impact of scientific research on society and the environment. FS 4(E) The student will evaluate models according to their limitations in representing biological objects or events.		
	<b>Dimensions of Food Science (Careers)</b>	<b>7 Days</b>	27.O
	FS 27(O) The student will prepare for a state or national food manager's sanitation certification or alternative credential within the field of food science technology.		

<b>Grading Period 2</b> <b>25 Days</b>	<b>Scientific Method</b>	<b>5 Days</b>	3.C, 3.D, 7.A, 7.B
	<p>FS 3(C) The student will know scientific theories are based on natural and physical phenomena and are capable of being tested by multiple independent researchers. Unlike hypotheses, scientific theories are well-established and highly-reliable explanations, but they may be subject to change as new areas of science and new technologies are developed.</p> <p>FS 3(D) The student will distinguish between scientific hypotheses and scientific theories.</p> <p>FS 7(A) The student will discuss elements, compounds, mixtures, and formulas related to food science.</p> <p>FS 7(B) The student will compare heterogeneous and homogeneous mixtures.</p>		
	<b>Scientific Measurement</b>	<b>5 Days</b>	3.E, 3.H, 7.C, 7.D
	<p>FS 3(E) The student will plan and implement descriptive, comparative, and experimental investigations, including asking questions, formulating testable hypotheses, and selecting equipment and technology.</p> <p>FS 3(H) The student will communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports.</p> <p>FS 7(C) The student will use chemical symbols, formulas, and equations in food science.</p> <p>FS 7(D) The student will analyze chemical and physical changes in food.</p>		
	<b>Data Collection &amp; Recording</b>	<b>2 Days</b>	3.F, 3.G
	<p>FS 3(F) The student will collect and organize qualitative and quantitative data and make measurements with accuracy and precision using tools such as calculators, spreadsheet software, data-collecting probes, computers, standard laboratory glassware, microscopes, various prepared slides, stereoscopes, metric rulers, electronic balances, gel electrophoresis apparatuses, micropipettors, hand lenses, Celsius thermometers, hot plates, lab notebooks or journals, timing devices, cameras, Petri dishes, lab incubators, dissection equipment, meter sticks, and models, diagrams, or samples of biological specimens or structures.</p> <p>FS 3(G) The student will analyze, evaluate, make inferences, and predict trends from data.</p>		
	<b>Energy Production in Food</b>	<b>6 Days</b>	13.A, 13.B, 13.C, 13.D
	<p>FS 13(A) The student will discuss molecular motion and temperature.</p> <p>FS 13(B) The student will examine heat transfer processes such as conduction, convection, and radiation.</p> <p>FS 13(C) The student will investigate the role of latent heat in phase changes in food production such as crystallization and condensation.</p> <p>FS 13(D) The student will analyze rates of reaction using various temperatures</p>		
<b>Food Categories &amp; Composition</b>	<b>7 Days</b>	5.A, 5.B	
<p>FS 5(A) The student will evaluate physical and chemical properties of acids and bases.</p> <p>FS 5(B) The student will analyze the relationship of pH to the properties, safety, and freshness of food.</p>			
<b>Grading Period 3</b> <b>25 Days</b>	<b>Properties of Carbohydrates</b>	<b>7 Days</b>	14.A, 14.B, 14.C, 14.D, 14.E, 14.F
	<p>FS 14(A) The student will discuss photosynthesis.</p> <p>FS 14(B) The student will identify the chemical structures of carbohydrates.</p> <p>FS 14(C) The student will describe the functions of carbohydrates in food production such as a caramelizing agent, crystallizing agent, and thickening agent.</p> <p>FS 14(D) The student will compare the structures of simple and complex carbohydrates and how these structures affect food production.</p> <p>FS 14(E) The student will describe various process such as gelatinization, retrogradation, and syneresis in food production.</p> <p>FS 14(F) The student will create food products using simple and/or complex carbohydrates</p>		
	<b>Water</b>	<b>7 Days</b>	18.A, 18.B, 18.C, 18.D
	<p>FS 18(A) The student will identify the properties of water.</p> <p>FS 18(B) The student will compare the effects of hard and soft water on food production.</p> <p>FS 18(C) The student will analyze the phases of water and their effects on food production.</p> <p>FS 18(D) The student will explain the functions of water in food preparation such as a heat medium and a solvent and create a food product.</p>		
	<b>Protein</b>	<b>7 Days</b>	16.A, 16.B, 16.C, 16.D, 16.E
<p>FS 16(A) The student will explain the processes of protein denaturation and coagulation.</p> <p>FS 16(B) The student will examine the functions of proteins in food productions such as emulsifiers, foams, and gluten formation.</p> <p>FS 16(C) The student will analyze the effect of temperature on protein in food production and storage.</p> <p>FS 16(D) The student will explore moist and dry heat methods for preparing protein rich foods.</p> <p>FS 16(E) The student will create food products using protein.</p>			
<b>Final Review and Test</b>	<b>4 Days</b>		

<b>Grading Period 4 33 Days</b>	<b>Properties of Fat</b>	<b>12 Days</b>	15.A, 15.B, 15.C, 15.D, 15.E, 15.F, 15.G
	FS 15(A) The student will identify the chemical structure of saturated and unsaturated fats. FS 15(B) The student will compare the properties of saturated and unsaturated fats. FS 15(C) The student will examine the functions of fats in food production. FS 15(D) The student will explore methods for controlling fat oxidation. FS 15(E) The student will analyze the effects of temperature on fats in food preparation. FS 15(F) The student will conduct laboratory experiments using the scientific processes to explore the functions of fats in food production. FS 15(G) The student will create food products using saturated and unsaturated fats.		
	<b>Vitamins &amp; Minerals</b>	<b>10 Days</b>	17.A, 17.B, 17.C
	FS 17(A) The student will discuss the functions of vitamins and minerals in the food production. FS 17(B) The student will compare the effects of food production on water- and fat-soluble vitamins. FS 17(C) The student will assess the interrelationships among vitamins and minerals in food production.		
	<b>Digestion &amp; Metabolism</b>	<b>11 Days</b>	9.A, 9.B, 9.C, 9.D
	FS 9(A) The student will describe how enzymes act as catalysts in chemical reactions of food. FS 9(B) The student will explain the relationship between an enzyme and a substrate. FS 9(C) The student will analyze the functions of enzymes in digestion, including the factors that influence enzyme activity. FS 9(D) The student will analyze enzyme reactions in food preparation.		
	<b>Fermentation</b>	<b>7 Days</b>	10.A, 10.B, 10.C
	FS 10(A) The student will analyze reasons food is fermented. FS 10(B) The student will access the role of bacteria in food fermentation. FS 10(C) The student will prepare various fermented food products.		
<b>Grading Period 5 34 Days</b>	<b>Leavening Agents</b>	<b>7 Days</b>	11.A, 11.B, 11.C, 11.D, 11.E
	FS 11(A) The student will identify various leavening agents and describe their role. FS 11(B) The student will analyze the role of acids as leavening agents. FS 11(C) The student will compare doughs and batters. FS 11(D) The student will conduct laboratory experiments with various leavening agents using the scientific processes. FS 11(E) The student will create baked products using various leavening agents.		
	<b>Sanitation &amp; Food Safety</b>	<b>7 Days</b>	2.A, 6.A, 6.B, 6.C, 6.D, 6.E, 6.F
	FS 2(A) The student will demonstrate safe practices during laboratory and field investigations. FS 6(A) The student will investigate the properties of microorganisms that cause food spoilage. FS 6(B) The student will compare food intoxication and food infection. FS 6(C) The student will examine methods to destroy or inactivate harmful pathogens in foods. FS 6(D) The student will compare beneficial and harmful microorganisms. FS 6(E) The student will analyze sanitary food-handling practices. FS 6(F) The student will prepare for a state or national food manager's sanitation certification or alternative credential within the field of food science technology.		
	<b>Emulsion</b>	<b>7 Days</b>	8.A, 8.B, 8.C, 8.D, 8.E, 8.F
	FS 8(A) The student will identify the solvent and solute in a given solution. FS 8(B) The student will compare unsaturated, saturated, and supersaturated solutions, including boiling and freezing points. FS 8(C) The student will calculate the concentration of a solution using mass percent. FS 8(D) The student will describe the properties of colloidal dispersions. FS 8(E) The student will investigate the relationships among the three parts of an emulsion. FS 8(F) The student will create various food emulsions.		
<b>Destroying Bacteria</b>	<b>6 Days</b>	19.A, 19.B	
FS 19(A) The student will examine the food irradiation process. FS 19(B) The student will investigate the pasteurization process.			
<b>Grading Period 6 29 Days</b>	<b>Packaging</b>	<b>10 Days</b>	20.A, 20.B, 20.C, 20.D
FS 20(A) The student will research food packaging guidelines. FS 20(B) The student will analyze components of appropriate commercial food containers. FS 20(C) The student will describe controlled-atmosphere packaging. FS 20(D) The student will describe information required on a food label.			

	<b>Food Preservation Process</b>	<b>5 Days</b>	21.A, 21.B, 21.C, 21.D
FS 21(A) The student will describe reasons for food preservation. FS 21(B) The student will compare methods of dehydration and create a food product using dehydration. FS 21(C) The student will analyze various methods of personal and commercial food canning. FS 21(D) The student will examine the various methods of personal and commercial food freezing.			
	<b>Food Additives, Flavor, Color &amp; Texture</b>	<b>6 Days</b>	12.A, 12.B, 12.C
FS 12(A) The student will evaluate the various types of food additives such as incidental, intentional, natural, and artificial. FS 12(B) The student will investigate the various roles of food additives such as food preservation, nutritive value, and sensory characteristics. FS 12(C) The student will research agencies involved in regulating food additives.			
	<b>Final Review &amp; Test* (*Senior activity days/graduation early = 9 days)</b>	<b>8 Days</b>	