Food Science (Proc 24)

PRE-TEST/POST-TEST TEKS BLUEPRINT

Pre-Test/Post-Test Development Overview

TEKS Addressed Selection Process

The Texas Essential Knowledge & Skills (TEKS) included in the course pre-test and post-test were selected for their direct relevance to the course content. This selection process was guided by the goal of assessing learners' understanding of specific topics and skills that are integral to the course. As a result, TEKS related to general employability skills or broader topics were often excluded. This focus ensures that the assessments accurately measure students' mastery of the subject matter, allowing educators to gain a clear insight into areas where students excel or may need additional support. By concentrating on content-specific TEKS, the tests provide a more precise evaluation of the students' knowledge and understanding of the core material.

Test Question Development Process

The questions created for the pre-test and post-test were designed using psychometric principles to ensure they are of high quality and fairness. This approach helps to accurately assess student understanding. These principles guide the development of questions to be reliable, valid, and free from bias, ensuring that they effectively measure the knowledge and skills the students are expected to acquire in the course.

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Knowledge & Skills Statement	Student Expectation	iCEV Lesson Title
(2) The student, for at least 40% of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to:	(C) use appropriate safety equipment and practices during laboratory, classroom, and field investigations as outlined in Texas Education Agency-approved safety standards;	Lab Safety Procedures: Food Science
(2) The student, for at least 40% of instructional time, asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to:	(E) collect quantitative data using the International System of Units (SI) and United States customary units and qualitative data as evidence;	Tools and Equipment in Food Science
(3) The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to:	(A) identify advantages and limitations of models such as their size, scale, properties, and materials;	Developing a Model: Food Science
(3) The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to:	(C) use mathematical calculations to assess quantitative relationships in data; and	Analyzing Data: Food Science
(3) The student analyzes and interprets data to derive meaning, identify features and patterns, and discover relationships or correlations to develop evidence-based arguments or evaluate designs. The student is expected to:	(D) evaluate experimental and engineering designs.	Experimental Design: Food Science
(4) The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:	(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and	Communicating Findings in Food Science
(5) The student knows the contributions of scientists and engineers and recognizes the importance of scientific research and innovation on society. The student is expected to	(B) relate the impact of past and current research on scientific thought and society, including research methodology, cost benefit analysis, and contributions of diverse scientists and engineers as related to the content; and	Impact of Science: Food Science
(6) The student analyzes household and commercial sustainability and regulatory practices in food production. The student is expected to:	(B) analyze the effect of food on the decomposition cycle, including composting, recycling, and disposal; and	Sustainability and Food Production
(7) The student analyzes the role of acids and bases in food science. The student is expected to:	(B) analyze the relationship of pH to the properties, safety, and freshness of food.	Scientific Principles: Chemical Properties
(8) The student evaluates the principles of microbiology and food safety practices. The student is expected to:	(A) investigate the properties of microorganisms that cause food spoilage;	Food Science: Safety and Sanitation
(8) The student evaluates the principles of microbiology and food safety practices. The student is expected to:	(B) compare food intoxication and food infection;	Food Science: Safety and Sanitation
(8) The student evaluates the principles of microbiology and food safety practices. The student is expected to:	(C) examine Methods to destroy or inactivate harmful pathogens in foods;	Food Science: Safety and Sanitation
(8) The student evaluates the principles of microbiology and food safety practices. The student is expected to:	(D) compare beneficial and harmful microorganisms, including lactic acid bacteria, acetic acid bacteria, various baking and brewing yeasts, E. coli, Staphylococcus, Clostridium botulinum, Clostridium perfringens, Salmonella, Listeria, and Shigella;	Food Science: Safety and Sanitation
(8) The student evaluates the principles of microbiology and food safety practices. The student is expected to:	(F) prepare for a state or national food manager sanitation certification or alternative credential within the field of food science technology.	Principles of HACCP: Introduction
(9) The student examines the chemical properties of food. The student is expected to:	(A) describe acids, bases, salts, carbohydrates, lipids, proteins and other elements, compounds, and mixtures related to food science;	Scientific Principles: Chemical Properties
(9) The student examines the chemical properties of food. The student is expected to:	(B) compare heterogeneous and homogeneous mixtures;	Scientific Principles: Chemical Properties

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(9) The student examines the chemical properties of food. The student is expected to:	(C) analyze chemical and physical changes in food; and	Scientific Principles: Chemical Properties
(10) The student analyzes solutions, colloids, solids, gels, foams, and emulsions in food science. The student is expected to:	(A) identify the solvent and solute in various solutions such as brines;	Scientific Principles: Solutions, Emulsion and Colloids
(10) The student analyzes solutions, colloids, solids, gels, foams, and emulsions in food science. The student is expected to:	(C) calculate the concentration of a solution using mass percent such as the concentration of sugar needed for crystallization;	Scientific Principles: Solutions, Emulsion and Colloids
(10) The student analyzes solutions, colloids, solids, gels, foams, and emulsions in food science. The student is expected to:	(E) differentiate between and give examples of temporary, semi-permanent, and permanent emulsions;	Scientific Principles: Solutions, Emulsion and Colloids
(10) The student analyzes solutions, colloids, solids, gels, foams, and emulsions in food science. The student is expected to:	(F) investigate the relationships between the three parts of a permanent emulsion; and	Scientific Principles: Solutions, Emulsion and Colloids
(10) The student analyzes solutions, colloids, solids, gels, foams, and emulsions in food science. The student is expected to:	(G) create temporary, semi-permanent, and permanent food emulsions.	Scientific Principles: Solutions, Emulsion and Colloids
(11) The student analyzes the functions of enzymes in food science. The student is expected to:	(B) explain the relationship between an enzyme and a substrate;	Scientific Principles: Enzymes
(11) The student analyzes the functions of enzymes in food science. The student is expected to:	(D) analyze enzyme reactions in food preparation, including cheese-making, the enzymatic tenderization of meat, and oxidation of sugars in fruit.	Scientific Principles: Enzymes
(12) The student evaluates the role of fermentation in food science. The student is expected to:	(B) describe the conditions under which bacterial fermentation of food occurs and use chemical equations to describe the products of fermentation; and	Food Fermentation
(12) The student evaluates the role of fermentation in food science. The student is expected to:	(C) prepare various fermented food products.	Food Fermentation
(13) The student assesses the reaction of leavening agents in baked products. The student is expected to:	(B) identify various leavening agents and describe their functions in food production;	Leavening Process
(13) The student assesses the reaction of leavening agents in baked products. The student is expected to:	(D) conduct laboratory experiments with various types and amounts of leavening agents to compare the doughs and batters produced; and	Leavening Process
(14) The student explores the roles of food additives. The student is expected to:	(A) evaluate the various types of food additives such as incidental, intentional, natural, and artificial;	Food Additives
(14) The student explores the roles of food additives. The student is expected to:	(C) research local, state, national, and international agencies involved in regulating food additives.	Food Additives
(15) The student analyzes the effects of heat energy transfer in food production. The student is expected to:	(B) compare heat transfer processes, including conduction, convection, and radiation;	Heat and Food Production
(15) The student analyzes the effects of heat energy transfer in food production. The student is expected to:	(C) investigate the role of phase changes in food production, including crystallization, coagulation, and reduction; and	Heat and Food Production
(15) The student analyzes the effects of heat energy transfer in food production. The student is expected to:	(D) demonstrate rates of reaction using various temperatures and describe the effects of temperature on the characteristics of food products.	Heat and Food Production
(16) The student evaluates the properties of carbohydrates in food and their effects on food production. The student is expected to:	(B) describe the functions of carbohydrates such as caramelization, crystallization, and thickening agents in food production;	Food Science: Carbohydrates
(16) The student evaluates the properties of carbohydrates in food and their effects on food production. The student is expected to:	(C) describe the processes of gelatinization and retrogradation in food production; and	Food Science: Carbohydrates
(17) The student evaluates the properties of fats in food and their effects on food production. The student is expected to:	(A) identify the physical properties and chemical structures of saturated and unsaturated fats;	Food Science: Fats
(17) The student evaluates the properties of fats in food and their effects on food production. The student is expected to:	(D) analyze the effects of temperature on fats in food preparation;	Food Science: Fats
(17) The student evaluates the properties of fats in food and their effects on food production. The student is expected to:	(E) conduct laboratory experiments using the scientific processes to explore the functions of fats in food production; and	Food Science: Fats
(18) The student evaluates the properties of proteins and their effects on food production. The student is expected to:	(A) identify the physical properties and chemical structures of proteins;	Food Science: Proteins

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(18) The student evaluates the properties of proteins and their effects on food production. The student is expected to:	(C) describe the functions and uses of proteins such as in emulsions, foams, and gluten formation;	Food Science: Proteins
(18) The student evaluates the properties of proteins and their effects on food production. The student is expected to:	(D) analyze the effects of moisture and temperature on protein in food production such as moist and dry heat Methods for preparation; and	Food Science: Proteins
(20) The student evaluates the properties of water and their effects on food production. The student is expected to:	(A) compare the effects of food production on water- and fat soluble vitamins and minerals	Food Science: Water
(21) The student explains nutritional aspects of food production. The student is expected to:	(B) identify common and special dietary modifications such as for food allergies, intolerances, or medical conditions;	Dietary Modification
(21) The student explains nutritional aspects of food production. The student is expected to:	(C) develop and modify recipes for dietary differences such as allergies and intolerances or for personal health preferences such as low-fat or sugar-free; and	Dietary Modification
(22) The student analyzes processes that manage bacteria to safe levels during food production. The student is expected to investigate processes that manage food bacteria such as dehydration, pasteurization, and food irradiation.	(A) investigate processes that manage food bacteria such as dehydration, pasteurization, and food irradiation	Food Science: Safety and Sanitation
(23) The student examines packaging and labeling guidelines. The student is expected to:	(A) research and evaluate federal food packaging regulations, including the information required on a food label;	Food Packaging Options and Guidelines
(23) The student examines packaging and labeling guidelines. The student is expected to:	(B) compare global food packaging regulations to those of the United States; and	Food Packaging Options and Guidelines
(23) The student examines packaging and labeling guidelines. The student is expected to:	(C) analyze the effectiveness of commercial food packaging for specific foods.	Food Packaging Options and Guidelines
(24) The student analyzes food preservation processes. The student is expected to:	(A) describe the benefits of food preservation;	The Science in Food Preservation
(24) The student analyzes food preservation processes. The student is expected to:	(B) compare various Methods of household and commercial dehydration, canning, and freezing; and	The Science in Food Preservation