Massachusetts Career Technical Education

Culinary Arts Framework

2014

This framework will be updated and included on the [Career-Connected Learning Hub.](http://www.macareerconnectedlearning.org) Visit the CCL Hub to register for an Employer or Educator Summit to provide feedback on the update , see the revision calendar, and access resources for this and other frameworks.

[Strand 2: Technical Knowledge and Skills](#_bookmark0)

###### Culinary Arts Safety Knowledge and Skills

* + 1. Demonstrate proper food safety and sanitation.
			1. Identify the Hazard Analysis Critical Control Point (HACCP) during all food handling processes as a method for minimizing the risk of food borne illness.
			2. Identify microorganisms related to food spoilage and illnesses; and describe their requirements and methods for growth.
			3. Describe symptoms common to food borne illnesses and how illness can be prevented.
			4. Conduct a sanitation self-inspection and recommend modifications for compliance with current industry and OSHA standards.
			5. Outline compliance requirements of sanitation and health inspections.
			6. Show exemplary appearance and hygiene.
			7. Describe cross contamination and use of acceptable procedures when preparing and storing potentially hazardous foods.
			8. List the reasons for and recognize signs of food spoilage and contamination.
			9. Outline the requirements for receiving and storage of raw and prepared foods.
			10. Identify risks associated with high risk populations.
			11. Recognize what foods are most likely to become unsafe.
			12. List the major foodborne illnesses and describe their characteristics.
			13. Demonstrate how to prevent time temperature abuse throughout the flow of food.
			14. Demonstrate the usage of thermometers in receiving, storing, preparing, cooking reheating foods, how to calibrate a thermometer and logging temperatures according to current industry and OSHA standards.
			15. Demonstrate how to prevent contamination of food, hot holding foods, cold holding foods, self service areas and serving customers.
			16. Identify common food allergens in food service and describe ways to produce allergen safe food for customers with food allergies.

* + 1. Performance Examples:
			- Define HACCP and list microorganisms related to food spoilage and illnesses.
			- Perform a sanitation self-inspection highlighting compliance requirements.
			- Define cross contamination and list acceptable procedures when receiving and storing foods.
			- List risks associated with high risk population. What tools are most likely to become unsafe; major food-borne illnesses and their characteristics and how to prevent time temperature abuse throughout the flow of food.
			- Demonstrate how to use thermometers and prevent time temperature abuse and contamination in food, hot holding foods and cold holding foods, self-service area and serving customers. according to current industry and OSHA standards
		2. Identify chemicals and uses in food service.
			1. Describe types of cleaners and sanitizers and their use.
			2. Develop cleaning and sanitizing schedule and procedures for equipment and facilities.
			3. Identify the location of S.D.S. binder. Identify all chemicals used in the facility, and using S.D.S sheets, list their potential hazards and emergency procedures in case of mishandling.

2.A.02 Performance Example:

* List types of cleaners and sanitizers and their use and develop a cleaning and sanitizing schedule and procedures for equipment and facilities.

###### Fundamentals of Food Service

* + 1. Apply the fundamentals of food service.
			1. Demonstrate hand tool and equipment operation, emphasizing technique.
			2. Define terminology used in food service.
			3. Discuss the application of labor saving products.
			4. Explain and demonstrate liquid and dry measures.
			5. Explain mise en place.
			6. Read, analyze and follow a standard recipe.
			7. Identify ingredients used for cooking and baking.
			8. Demonstrate knife skills according to current industry and OSHA standards.

* + 1. Performance Examples:
			- Perform hand tool and equipment operation emphasizing on techniques and safety skills.
			- Review a standard recipe, identify the ingredients and accurately use liquid and dry measure.
			- Prepare a work station and summarize the concept of mise en place.
		2. Apply the fundamentals of menu planning, ordering, receiving and storage.
			1. Plan a menu.
			2. Order food products.
			3. Cost out given recipe.

2.B.02 Performance Examples:

* Prepare a menu; calculate food costs and labor costs.
* Identify all food products needed to prepare a given menu and demonstrate procedure of ordering, receiving and storage of all food products.
* Calculate the total cost of the menu

###### Fundamentals of Dining Room Operations

* + 1. Demonstrate dining room operations.
			1. Set up tables for service.
			2. Set up various dining room stations for service (e.g., beverages, condiments, bread, salads, etc.).
			3. Arrange and maintain buffet table.
			4. Conduct a pre-meal meeting.
			5. Prepare and maintain restaurant and work stations for dining room service.
			6. Identify the sequence/steps of service, including banquet and catering.
			7. Identify and perform all methods of service.
			8. Set up and break down a hot and cold buffet.
			9. Prepare tray service.
			10. Perform the duties of a cashier.
			11. Perform the duties of an expediter.
			12. Perform duties of a dining room supervisor.
			13. Perform host or hostess duties.
			14. Explain methods used to accommodate customers.
			15. Manage dining room floor plans.
			16. Demonstrate a function set up using a banquet event order.
			17. Compare the differences between a` la carte and banquet food service.

* + 1. Performance Examples:
			- Arrange and maintain buffet table service including banquet and catering services.
			- Manage and maintain restaurant and work stations for dining room service.
			- Perform duties of dining room manager and cashier.
			- Summarize the difference between a la carte and banquet service.

###### Fundamentals of Utility Services

* + 1. Demonstrate utility services.
			1. Perform dishwashing services.
			2. Clean and sanitize pots and pans.
			3. Clean and sanitize kitchen work areas.
			4. Clean and sanitize stationary equipment.

* + 1. Performance Examples:
			- Perform dishwashing services to include procedure for cleaning and sanitizing pots, pans, kitchen work areas and stationary equipment.

###### Fundamentals of Basic Nutrition

* + 1. Explain basic nutrition.
			1. List the food groups in the current USDA Food Guide My Plate and the recommended daily servings from each.
			2. Define calories (Kcals), Macro/Micro Nutrients and common food sources.
			3. Describe a balanced diet and the methods for weight loss while maintaining a balanced diet.
			4. Define RDA guidelines.
			5. Summarize information provided on food labels.
			6. Identify common food allergies and determine substitutions.
			7. Identify recommended portions of food groups in a balanced diet.
			8. Identify and prepare foods to meet special dietary needs.

* + 1. Performance Examples:
			- List the food groups and recommended serving sizes based on the USDA Food Guide My Plate.
			- Describe nutrients and their functions.
			- Define RDA guidelines and summarize information on food labels.
			- List common food allergies, recommend substitutions and identify foods to meet special diets.

###### Fundamentals of Cooking Methods

* + 1. Describe and demonstrate cooking methods.
			1. Identify cooking methods.
			2. Demonstrate baking/roasting.
			3. Demonstrate braising.
			4. Demonstrate broiling.
			5. Demonstrate deep-frying.
			6. Demonstrate grilling.
			7. Demonstrate griddling.
			8. Demonstrate pan-frying.
			9. Demonstrate poaching.
			10. Demonstrate sautéing.
			11. Demonstrate steaming.
			12. Demonstrate stewing.

* + 1. Performance Examples:
			- List and define cooking methods; moist heat and dry heat.
			- Perform all moist heat cooking methods.
			- Perform all dry heat cooking methods.
		2. Prepare grains, legumes, and starches.
			1. Identify, prepare and cook grains.
			2. Identify, prepare and cook legumes.
			3. Identify, prepare and cook rice.
			4. Identify, prepare and cook pasta.
			5. Identify, prepare and cook potatoes.

2.F.02 Performance Examples:

* Identify and prepare grains.
* Identify and prepare legumes.
* Identify and prepare starches.
	+ 1. Prepare stocks and sauces.
			1. Identify and prepare brown, white, fish, and vegetable stock.
			2. Identify and prepare 5 mother sauces.
			3. Identify and prepare intermediate and small sauces.
			4. Identify and prepare non-roux-based sauces.
			5. Identify and use thickening agents.

2.F.03 Performance Examples:

* Prepare four major sauces.
* Prepare mother sauces and small sauces.
* Identify and prepare thickening agents and non-roux-based sauces.
	+ 1. Prepare soups.
			1. Identify and prepare thick soups.
			2. Identify and prepare clear soups.
			3. Identify and prepare specialty soups.

2.F.04 Performance Examples:

* Identify and prepare thick and clear soups.
* Identify and prepare specialty soups.
	+ 1. Prepare various types of meat.
			1. Identify various cuts and types of meat.
			2. Cut and prepare meats for various cooking methods.

2.F.05 Performance Examples:

* List and identify various cuts and types of meat.
* Cut and prepare meats for various cooking methods.
	+ 1. Prepare various types of seafood.
			1. Identify various cuts and types of seafood.

2.F.06 Performance Examples:

* List and identify various cuts and types of seafood.
* Cut and prepare seafood for various cooking methods.
	+ 1. Prepare various types of poultry.
			1. Identify various cuts and types of poultry.
			2. Cut and prepare poultry for cooking methods.

2.F.07 Performance Examples:

* List and identify various cuts and types of poultry.
* Cut and prepare poultry for various cooking methods.
	+ 1. Prepare sandwiches.
			1. Identify types of sandwiches.
			2. Prepare basic and specialty sandwiches.

2.F.08 Performance Examples:

* List the types of sandwiches, prepare basic and specialty sandwiches.
	+ 1. Prepare breakfast meats, eggs, cereals and batter products.
			1. Identify and prepare breakfast meats.
			2. Identify and prepare eggs.
			3. Identify and prepare cereals.
			4. Identify and prepare batter products.

2.F.09 Performance Examples:

* Prepare breakfast to include meats, eggs and cereals.
* Prepare breakfast batter products.
	+ 1. Apply the fundamentals of Garde Manger, hors d’oeuvres, and appetizers.
			1. Identify tools and equipment used in garde manger.
			2. Prepare fruit and vegetable dishes and garnishes.
			3. Present food using various buffet techniques.
			4. Prepare hot and cold appetizers and hors d’oeuvres.
			5. Prepare various marinades, salads, and dressings.

2.F.10 Performance Examples:

* List tools and equipment used for garde manger.
* Prepare fruits and vegetable dishes and garnishes.
* List and prepare various marinades, salads and dressings.
	+ 1. Apply the fundamentals of baking.
			1. Identify ingredients used for baking.
			2. Describe properties and list function of ingredients.
			3. Define baking terms.
			4. Select equipment and utensils for specific baking applications.
			5. Identify mixing methods used in baking.
			6. Identify healthy alternatives and substitutions used in baking.

2.F.11 Performance Examples:

* Identify ingredients and tools used in baking.
* Identify mixing methods and healthy alternatives used in baking.
	+ 1. Prepare baked goods.
			1. Identify various baked goods, including yeast-raised products, quick-breads, muffins, pies, pie dough products, cakes, cookies, and paté-a-choux.
			2. Multiply and reduce a recipe for baked goods.
			3. Prepare, bake, and finish lean dough products.
			4. Prepare, bake, and finish rich dough products.
			5. Prepare, bake, and finish rolled-in products.
			6. Prepare, bake, and finish quick breads, biscuits, and muffins.
			7. Prepare, bake, and finish pie dough and pie dough products.
			8. Prepare, bake, and finish fat type cakes.
			9. Prepare, bake, and finish egg foam cakes.
			10. Prepare, bake, and finish cookies using different make-up methods.
			11. Prepare, bake, and finish pâte-à-choux based desserts.

2.F.12 Performance Examples:

* Identify various baked goods, multiply and cost out recipes for baked goods.
* Prepare, bake and finish products.
	+ 1. Prepare frostings and finish baked goods.
			1. Identify and prepare various types of frostings and icings.
			2. Prepare baked goods to be finished.
			3. Frost cakes and pastries.
			4. Make borders and floral designs for decorated cakes.
			5. Inscribe a cake.

2.F.13 Performance Examples:

* Identify, list and prepare various types of frostings and icings.
* Frost cakes and pastries, make borders, floral designs, decorated and inscribe cakes.
	+ 1. Prepare desserts.
			1. Identify non-baked desserts commonly created in a bakery.
			2. Prepare and cook custards and fillings.
			3. Prepare specialty desserts.
			4. Prepare plated desserts.

2.F.14 Performance Examples:

* Prepare non-baked desserts created in a bakery.
* Prepare and cook custard, fillings, specialty desserts and plated desserts.

# [Strand 3: Embedded Academics](#_bookmark0)

### [Embedded English Language Arts and Literacy](#_bookmark0)

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| CTELearning Standard Number | Strand Coding Designation Grades ELAsLearning Standard Number | Text of English Language Arts Learning Standard |
| 2.A.01 | RI.11-12.1RI.11-12.4RI.11-12.7RI.11-12.10W.11-12.1W.11-12.2W.11-12.4W.11-12.6W.11-12.7W.11-12.8W.11-12.9W11-12.10 | Develop and strengthen writing as needed by planning, revising,editing, rewriting, or trying a new approach, focusing on addressingwhat is most significant for specific purpose and audience.Performance Example:Outline compliance requirements for sanitation and health inspections, Formulate open-ended questions on possible outcomes with research and documentation on potential remedies. |
| 2.A.012.A.01 | SL.11-12.2 SL.11-12.4SL.11-12.5SL.11-12.6L.11-12.1L.11-12.3L.11-12.4L.11-12.6RI.11-12.4RI.11-12.7 | Produce clear and coherent writing in which the development organization and style are appropriate to task, purpose andaudience.Performance Example:* Deliver formal presentation for particular audiences using clear and appropriate organizations, gestures, tone and vocabulary on the topics of cross contamination. Include the use of acceptable procedures when

preparing and storing potentially hazardous foods.Produce clear and coherent writing in which the developmentorganization and style are appropriate to task, purpose andaudience.Performance Example:Use general dictionaries, specialized dictionaries, thesauruses, histories of language, books of quotations and other related references as needed on the topic of cross contamination. |
| 2.A.02 | W.11.12.4 W.11.12.10 | Produce clear and coherent writing in which the development organization and style are appropriate to task, purpose andaudience.Write routinely over extended time frames and shorter time framesfor a range of discipline specific tasks, purposes and audiences.Performance Example:Students will demonstrate key components of good written communication skills in writing and developing a cleaning and sanitation schedule and procedures for equipment and facilities. |
| 2.C.01 | W.9.12.5 | Develop and strengthen writing as needed by planning, revising, editing, rewriting or typing a new approach, focusing on addressing what is most significant for specific purposes and audiences.Performance Example:* Using graphic organizers, students will create an organizational chart on the departments of food and beverage property.

Students will create a flip chart defining job descriptions in the food industry demonstrating clear, concise and coherent writing. |
| 2.E.01 | W.6.12.4 | Produce clear and coherent writing in which the development organization and style are appropriate to task, purpose and audience.Performance Example:Using content specific topics, students will create graphic organizers such as top-down webs and venn diagrams demonstrating knowledge and understanding of the topic, using domain specific vocabulary. |
| 2.F.052.F.062.F.072.F.102.F.13 | W.6.12.4W.9.12.5 | Produce clear and coherent writing in which the developmentorganization and style are appropriate to task, purpose andaudience.Develop and strengthen writing as needed by planning, revising,editing, rewriting or typing a new approach, focusing on addressingwhat is most significant for specific purposes and audiences.Performance Example:Using content specific topics, students will create graphic organizers such as top-down webs and venn diagrams demonstrating knowledge and understanding of the topic, using domain specific vocabulary. |

### [Embedded Mathematics](#_bookmark0)

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| CTELearning Standard Number | Math Content Conceptual Category and Domain Code Learning Standard Number | Text of Mathematics Learning Standard |
| 2.B.01 | N-Q.1N-Q.2N-Q.3A-SSE.3` | Number and Quantity Number and Quantity Number and QuantityAlgebra – Seeing Structure in ExpressionsPerformance Example:* Use units as a way to understand problems and to guide the solution of multi-step problems, such as changing quantities in a standard recipe.

Choose and produce an equivalent form of expression and explain properties of the quantity when using liquid and dry measures. |
| 2.B.02 | A-CED.1 | Algebra – Creating EquationsPerformance Example:Create equations and inequalities in one variable and use them to solve problems when planning a menu and determining pricing. |
| 2.C.012.C.02 | Measurement 10 10.M.1 | Calculate perimeter, circumference and area of geometric figures such as parallelograms, circles and triangles.Performance Example:* Students will accurately design the layout for a large wedding in a banquet hall. It must include the area of

the area of the room, the dance floor, the D.J. / band equipment, two buffet lines, beverage service area, small round table for cake; then based on the size of the room, estimate how many 10 ft. tables would fit. |
| 2.F.12 | Patterns, Relations and Algebra 10 | Solve everyday problems that can be modeled using systems of linear equations or inequalities. Apply algebraic and graphicalmethods to solution. Use technology when appropriate. Include mixture, rate and work problems.Performance Example:* Students will be able to increase or decrease standardized recipes in preparing baked goods.

Students will be able to quantify the cost of each baked good. |

### [Embedded Science and Technology/Engineering](#_bookmark0)

#### [Life Science (Biology)](#_bookmark0)

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| CTELearning StandardNumber | Subject Area,Topic Heading and Learning StandardNumber | Text of Biology Learning Standard |
| 2.A.01.012.A.01.022.A.01.032.A.01.15 | Biology 2.3 | Use the cellular evidence (e.g. cell structure, cell number, cell reproduction) and modes of nutrition to describe the six kingdoms(Archaebacteria, Eubacteria, Protista, Fungi, Plantae, AnimaliaPerformance Example:* Students will explain how the most common types of food borne illness originate. They will give examples of different types of food borne illnesses, provide the organism type, its cellular structure and modes of reproduction. Students will then explain how to prevent contamination and methods of infestations of various pests and pathogenic microbes.
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| 2.A.01.012.E.01.06 | Anatomy and Physiology 4.7 | Recognize that communication among cells is required for coordination of body functions. The nerves communicate with electrochemical signals, hormones circulate through the blood and some cells produce signals to communicate only with nearby cells.Performance Example:Students will accurately define term “allergy” versus “food intolerance” and explain how the human body responds to foods in each situation. |

#### [Physical Science (Chemistry)](#_bookmark0)

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| CTELearning StandardNumber | Subject Area,Topic Heading and Learning StandardNumber | Text of Chemistry Learning Standard |
| 1.A.021.A.02.03 | Properties of Matter 1.1 | Identify and explain physical properties (i.e. density, melting point, conductivity, malleability) and chemical properties (i.e. the ability toform new substances). Distinguish between chemical and physicalchanges.Performance Example:Students will correctly read and interpret information on an SDS to best protect themselves, their colleagues and customers. |
| 2.A.01.152.A.02.012.A.02.07 | Solutions, Rates of Reactionand Equilibrium 7.1 | Describe the process by which solutes dissolve in solvents.Performance Example:Students will accurately create 10% bleach solution for disinfecting purposes and be able to identify the solute, solvent and final solution. |
| 2.A.01.012.A.01.022.F.11 | Acids and bases and oxidation– Reduction Reactions 8.21, 4 Grades 11 – 12 | Relate hydrogen ion concentrations to the ph scale and to acidic,basic and neutral solutions. Compare and contrast various commonacids and bases (e.g. vinegar, baking soda, soap, citrus juice).Performance Example:Students will explain why bacterial growth is inhibited in acidic environments.ChemistryPerformance Example:Distinguish between chemical and physical changes in the methods used in baking. |

#### [Physical Science (Physics)](#_bookmark0)

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| CTELearning Standard Number | Subject Area, Topic Heading and Learning Standard Number | Text of Physics Learning Standard |
| 2.F.012.F.02 | Heat and Heat Transfer 3.1 | 3.1 Explain how heat energy is transferred by convection, conduction and radiation.Performance Example:* Students will explain the benefit of convection ovens over traditional ovens and describe various scenarios in which a food service director would need the use of convection ovens versus traditional oven settings. Students will additionally discuss the benefits of microwave ovens and radiation exposure to minimize food

borne illness. |
| 2.A.01.14 | Heat Transfer 3.2 | Explain how heat energy will move from a higher to a lower temperature until equilibrium is reached.Performance Example* Students will accurately demonstrate how to take temperature of prepared foods to ensure minimal food poisoning risk. Students will explain the rationale behind the criteria for each measurement (why thermometers are inserted into the thickest part of the meat, poultry and fish.
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[Industry Recognized Credentials](#_bookmark0) (Licenses and Certifications/Specialty Programs)

American Culinary Federation

1. ACF Student Certification: [www.acfchefs.org](http://www.acfchefs.org/)
2. Certification for Foodsource Educators and Industry Professionals: [www.cafemeetingplace.com](http://www.cafemeetingplace.com/)
3. Career Safe Certification: [www.careersonline.com](http://www.careersonline.com/)
4. ProStart National Certificate of Achievement: [www.nraef.org/ProStart-National-Certificate-of-](http://www.nraef.org/ProStart-National-Certificate-of-) Achievement - (COA)
5. Servsafe Food Handlers Certificate: [www.servsafe.com/home](http://www.servsafe.com/home)
6. Baking Schools and Certificates: [www.degreedictionary.org/articles\_baking\_schools\_and\_certifications](http://www.degreedictionary.org/articles_baking_schools_and_certifications)
7. Massachusetts Restaurant Association Food Handlers Certificate: [www.massrestaurantassoc.org](http://www.massrestaurantassoc.org/)
8. Allergy Awareness Certificate: [www.restaurant.org](http://www.restaurant.org/)