

# Food and Nutrition I

6/2015

(Food and Nutrition Sciences 1-Course Name change effective school year 2016-17)

Levels: 9-12

Units of Credit: .50

CIP Code: 20.0108

Core Code: 34-01-00-00-150

Prerequisite: None

Skill Test #340

## COURSE DESCRIPTION

This course is designed to focus on the science of food and nutrition. Experiences will include food safety and sanitation, culinary technology, food preparation and dietary analysis to develop a healthy life style with pathways to career readiness. Laboratory based experiences strengthen comprehension of concepts and standards outlined in Sciences, Technology, Engineering and Math (STEM) education. FCCLA may be an integral part of this course. (Standards 1-6 will be covered on Skill Certification Test #340.)

## CORE STANDARDS, OBJECTIVES, AND INDICATORS

### PERFORMANCE OBJECTIVE 1

Complete FCCLA Step One. [http://www.uen.org/cte/facs\\_cabinet/facs\\_cabinet10.shtml](http://www.uen.org/cte/facs_cabinet/facs_cabinet10.shtml)

### STANDARD 1

**Students will consistently demonstrate kitchen safety procedures and sanitation techniques.**

**Objective 1:** Apply established safety rules and guidelines to maintain a safe working environment.

- a. Identify safety practices for using electric appliances.
  - With electrical appliances, use dry hands, stand on dry floor and keep away from water.
  - Plug cord into electrical appliance before plugging into power source.
- b. Explain how to extinguish a grease fire.
  - To extinguish a grease fire, use a lid on the pan, baking soda/salt or fire extinguisher.
  - Avoid water or flour.
- c. Identify proper storage of cleaning chemicals.
  - Cleaning supplies should be stored away from foods. Keep cleaning supplies in original containers.
- d. Explain prevention of: burns, cuts, fires, falls, electrical safety, and lifting techniques.
  - Dull knives are more dangerous and less efficient than sharp knives.
  - Keep clothing away from direct heat.
  - Avoid plastic on or near the range.
  - Turn handles away from the front of the range.
  - Clean up spills immediately to avoid falls.
  - Lift lids on hot foods away from you.
  - Use hot pads or oven mitts for handling hot baking pans.
  - Store heavy items on lower shelves.
  - Use a step stool for reaching high objects.

**Objective 2:** Identify proper first-aid procedures for cuts, burns and electrical shock. **\*STEM (Biology/Science)**

- a. Identify ways to prevent poisoning and chemical contamination. (Mixing chlorine with any product containing ammonia will create toxic and deadly fumes.)
  - Keep cleaning supplies away from food.
  - Mixing chlorine with any product containing ammonia will create toxic deadly fumes.

- b. Identify basic first-aid for cuts and burns.
  - First aid for severely bleeding cut: apply direct pressure over wound.
  - First aid for a first degree burn: place burned area under cold running water.
- c. Identify proper first-aid procedures for electrical shock.
  - To avoid electrical shock: avoid any water and electrical contact, use dry hands to disconnect appliances before cleaning and disconnect the main power source before approaching injured person.

**Objective 3:** Identify health and hygiene requirements for food handling. \*STEM (Science)

- a. Identify proper hand washing and when a double hand wash is required.
  - Wash hands with soap and warm water for a minimum of twenty seconds.
  - Wash hands before/after handling raw meat, poultry or eggs.
- b. Describe personal hygiene practices.
  - Wash hands after using restroom, sneezing, coughing, changing diapers, etc.
- c. Identify appropriate clothing and hair restraints.
  - Appropriate clothing includes clean clothing and apron. Cover or tie back hair with appropriate hair restraints before working with food.

**Objective 4:** Identify and apply sanitation rules and guidelines. \*STEM (Science)

- a. Identify proper dishwashing techniques.
  - Describe the three-sink method of cleaning and sanitizing pots and pans and how to correctly dry dishes.
  - Describe the correct procedure for cleaning and sanitizing using a dish machine.
  - Dish washing order (by hand): rinse and scrape first, glassware before silverware, plates and bowls, pots and pans last.
- b. Discuss cleaning and sanitizing of work surfaces.
  - Keep all work surfaces clean.
  - Disinfect work surfaces to prevent cross-contamination.
  - When tasting foods, always use a clean spoon and use only once.
  - To reduce pest/insects, avoid crumbs or spills, keep staples in airtight containers and dispose of garbage properly.
- c. Discuss cleaning chemicals and how to use them safely on food contact surfaces.
  - Always use cleaners and sanitizers according to manufactures directions. Clean the surface. Rinse the surface. Sanitize the surface, then allow the surface to air dry.
- d. Discuss appropriate use of utensils and gloves to avoid bare-hand contact with ready-to-eat foods.
  - Wear gloves if you have a cut or open sores on hands.
- e. Describe the correct procedures for storing dishes and utensils.
  - Utensils and equipment should be stored in ways that prevent contamination.
  - Store utensils and equipment that touches food at least six inches off the floor.
  - Store glasses and cups upside down on a clean, sanitized surface, and store utensils with handles up.
- f. Describe the correct procedures to handle trash and garbage.
  - Garbage can contaminate food and equipment if it isn't handled safely. Remove garbage from prep areas as quickly as possible.
  - Do not clean garbage containers near food prep or food storage areas. Clean the inside and outside of garbage cans often.
  - Close the lids on outdoor containers.

**Objective 5:** Identify methods that prevent food-borne illnesses and contamination. \*STEM  
(Biology/Science)

- a. Define the characteristics of a food-borne illness.
  - Food-borne illness results from eating contaminated foods containing poisonous toxins.

- Fever, headache and digestive troubles are symptoms of food-borne illness.
  - Food will often look and smell normal. They may not always have off-odors or off- flavors.
  - When in doubt, throw it out.
  - List sources of microbes. A microbe is anything too small to be visible to the naked eye. Three types of microbes found in food are bacteria, viruses and fungi (yeast and mold). Foods like milk/dairy, meat, fish, eggs, poultry, shellfish/crustaceans, baked potatoes, tofu, sprouts, cooked rice, beans and vegetables, sliced melons or tomatoes and lettuce are susceptible to bacterial growth.
- b. Identify types of food-borne illness, their symptoms and common sources of contamination:
- Botulism
    - Associated with improperly canned foods, specifically low-acid foods.
  - E-coli
    - Bacteria spread by air from soil, ground and fecal matter to food sources. Usually found in undercooked ground beef, unpasteurized milk, fruit juices, fresh fruits and vegetables. E-coli will be killed by cooking or heating to a high enough temperature.
  - Hepatitis A
    - Virus from fecal matter transferred by human contact, usually through improper hand washing.
  - Salmonella
    - Bacteria often found in raw poultry and eggs.
  - Staphylococci
    - Bacteria spread through human mucous contact to food sources.
  - Norovirus
    - Associated with raw produce, contaminated water, and foods that are not reheated after contact with an infected handler.
  - Clostridium Perfringens
    - Associated with meats, poultry, gravy, dried or precooked foods, time/temperature-abused foods.
  - Campylobacter SPP
    - Usually found in raw and undercooked poultry, unpasteurized milk, and contaminated water.
- c. Identify population groups that are most vulnerable to food-borne illness.
- Population groups most vulnerable to food borne illness include young children, older adults, pregnant women, and people with immune systems weakened by disease or medical treatment- "YOPI's" [Young, Old, Pregnant, and Immune-Compromised].
- d. Identify how to prevent food-borne illness contamination through burns, cuts or other wounds.
- Wash hands before putting on gloves and when changing to a new pair of gloves.
  - Only use single-use gloves when handling food. Gloves should fit your hand.
  - Change gloves when they get dirty or torn, before beginning a new task, or after handling raw meat, seafood, and poultry.
  - Wear bandages over wounds and use a water-proof finger-cover over bandages and under gloves.
- e. Define cross contamination and explain prevention techniques.
- A large majority of food-borne illnesses can be prevented by practicing proper hand washing.
  - Throw away any food with an off odor and do not taste or use.
  - Do not buy or use bulging cans.
  - Frequently clean and sanitize work surfaces.
  - Ways to avoid cross contamination:
    - Never place cooked food on a plate which has previously held raw meat, poultry or seafood.
    - Always wash hands, cutting boards, etc. with hot soapy water after they come in contact with raw meat, poultry or seafood.
- f. Identify proper temperatures:
- Temperature Danger Zone: 41-135 degrees
    - Describe the relationship between cooking time and temperature in killing microorganisms.

- Foods should not be in the Temperature Danger Zone for more than two hours.
- Foods held in the danger zone for longer than 4 hours should be thrown out. In the industry, restaurants get 4 hours since food is delivered in a refrigerated truck and moved directly to the refrigerator in the restaurant. Home use it is 2 hours.
- Discuss proper date and time marking for foods.
- List appropriate temperatures for refrigerators, freezers and steam tables.
- Heating, reheating and serving foods: 165 degrees
- Cold storage of foods: 40 degrees or below
  - Discuss steps used to cool food rapidly
  - Keep freezer temperature at 0 degrees Fahrenheit to keep foods frozen solid.
  - Keep hot foods hot and cold foods cold.
- Internal food temperatures: (Always use a thermometer to check actual temperature.)
  - Seafood, beef, veal, lamb, pork: at least 145 degrees
  - Ground meats (pork, beef, veal, lamb) : 155 degrees
  - All poultry (whole or ground): 165 degrees
- g. Explain how to correctly thaw foods.
  - In the refrigerator for 2-3 days. This is the safest method.
  - In a sink of cold, running water. Or a sink full of cold water, changing the water every 30 minutes. Use food immediately.
  - In the microwave, if using the food immediately.
    - Never defrost frozen foods at room temperature.
- h. Define Temperature Controls for Safety (TCS)
  - Foods that require time or temperature controls for safety (TCS).
- i. Identify potential hazardous foods and the dangers of leaving them at room temperature.
  - Any type of food can be contaminated, but some types allow more microbe/pathogen growth.
  - The best way to control pathogen growth in these items is to control time and temperature.
  - Foods like milk/dairy, meat, fish, eggs, poultry, shellfish/crustaceans, baked potatoes, tofu, sprouts, cooked rice, beans and vegetables, sliced melons or tomatoes and lettuce are susceptible to bacterial growth.

## **PERFORMANCE OBJECTIVE 2**

Consistently demonstrate preventative practices related to kitchen safety and sanitation procedures.

## **PERFORMANCE OBJECTIVE 3**

Students will complete food and kitchen safety training comparable to that required for the ServSafe Food Handlers Certificate with the option to acquire a Food Handlers Permit from your county Health Department through the Utah Restaurant Association.

## **STANDARD 2**

**Students will apply the skills of kitchen equipment and management.**

**Objective 1:** Identify types, use and care of selected kitchen equipment. \*STEM (Technology)

- a. Identify various types of kitchen equipment.
 

● bread knife	● chef's knife	● colander/strainer
● cutting board	● ladle	● meat thermometer
● oven thermometer	● pancake turner	● paring knife
● pastry blender	● rolling pin	● rubber scraper
● slotted spoon	● straight edge spatula	● tongs
● vegetable peeler	● wire whisk	● wooden spoon
- b. Select appropriate equipment for specific product preparation.
  - Appropriate equipment for specific preparation include:
    - using pastry blender for cutting fat into flour.
    - straight edge spatula for leveling off or spreading frosting.
    - wooden spoon for cooking on top of the stove.
    - wire whisk used for blending liquids.

- c. Demonstrate the proper use and care of equipment.
- d. Demonstrate basic knife skills, including safety and proper handling.
  - Use caution with sharp objects such as knives and blender blades.
- e. Employ standard safety procedures when using equipment.
- f. Identify the basic principles of cooking in a microwave.
  - Microwaves are attracted to fat, sugar and water molecules.
  - Microwaves cause molecules to vibrate. Vibration creates friction, which produces the heat that cooks the food.
  - Appropriate and safe cooking containers include: microwave safe plastic, glass and paper; not metal. Shallow, round containers cook more evenly than square containers.
  - Standing time is the time food continues to cook after the microwave has stopped. Quantity/volume of food in the microwave increases cooking and standing time.
  - Stir and rotate foods for even cooking.
  - Covering foods holds in the moisture and helps foods to cook more evenly and prevent splattering. Cover with plastic wrap, paper towel, wax paper or lid.
  - Microwave cooking does not brown foods or give a crisp crust.
  - To prevent burns, use pot holders and direct steam away from body.

**Objective 2:** Identify abbreviations, food measurement terminology and demonstrate proper measuring techniques. **\*STEM (Math)**

- a. Identify abbreviations.
 

<ul style="list-style-type: none"> <li>• Tablespoon = T. Tbs. or Tbsp.</li> <li>• Gallon = gal.</li> <li>• Pint = pt.</li> <li>• Pound = lb. or #</li> <li>• Hour = hr.</li> </ul>	<ul style="list-style-type: none"> <li>• Teaspoon = t. or tsp.</li> <li>• Quart = qt.</li> <li>• Cup = c.</li> <li>• Ounce = oz.</li> <li>• Minute = min.</li> </ul>
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- b. Identify measuring techniques and tools.
  - Use dry measuring cups for dry ingredients and level with a straight edge spatula.
  - Use liquid measuring cups for liquid ingredients. Measure at eye level on a flat, level surface.
  - Brown sugar is packed and leveled in dry measuring cups.
  - Shortening is pressed into dry measuring cups and leveled; or use water displacement method.
  - Use most effective tools for measuring. For example: use  $\frac{1}{4}$  cup rather than 4 Tbsp.
  - Use measuring spoons for ingredients less than  $\frac{1}{4}$  cup.
  - Do not measure directly over the mixing bowl.

**Objective 3:** Integrate mathematic concepts through equivalents, recipe adjustments and conversions. **\*STEM (Math)**

- a. Compute equivalents.
 

<ul style="list-style-type: none"> <li>• 3 t. = 1 T.</li> <li>• 4 qt. = 1 gal.</li> <li>• c. = 1 pt.</li> </ul>	<ul style="list-style-type: none"> <li>• 4 T. = <math>\frac{1}{4}</math> c.</li> <li>• 16 c. = 1 gal.</li> <li>• 1 stick butter = <math>\frac{1}{2}</math> c.</li> </ul>	<ul style="list-style-type: none"> <li>• 16 T. = 1 c.</li> <li>• 8 fl. oz. = 1 c.</li> <li>• 16 oz. = 1 lb.</li> </ul>
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- b. Double and cut recipe size in half.
  - When cutting a recipe in half, or doubling a recipe, the cooking temperature will remain the same.
  - The amount of ingredients, length of cooking time and size of pan will be affected.
  - Use appropriate math principles for increasing/decreasing fractions.
- c. Analyze, prepare and complete a recipe.

**Objective 4:** Explain basic food-preparation terminology.

- a. Define cooking terms: chop, cream, cut in, dice, dredge, flour, fold in, grate, knead, mince, peel, sauté, simmer, steam and whip.
  - Chop: to cut into small pieces
  - Cream: to work sugar and fat together until the mixture is soft and fluffy

- Cut-in: to cut fat into flour with a pastry blender or two knives
- Dice: to cut into very small cubes
- Dredge: to coat food heavily with flour, breadcrumbs or cornmeal
- Flour: to sprinkle or coat with a powdered substance, often with crumbs of seasonings
- Fold-in: to mix ingredients by gently turning one part over another
- Grate: to finely divide food in various sizes by rubbing it on surface with sharp projections
- Knead: to work dough to further mix the ingredients and develop the gluten
- Mince: to cut or chop food as finely as possible
- Peel: to remove or strip off the skin or rind of some fruits and vegetables
- Sauté: to brown or cook foods with a small amount of fat using low to medium heat
- Simmer: to cook just below the boiling point
- Steam: to cook by the vapor produced when water is heated to the boiling point
- Whip: to beat rapidly to introduce air bubbles into food

#### **PERFORMANCE OBJECTIVE 4**

Consistently demonstrate proper measuring and preparation techniques while preparing a recipe.

#### **STANDARD 3**

**Students will identify the sources and functions of carbohydrates and fiber and apply appropriate food preparation techniques.**

**Objective 1:** Identify carbohydrates, their sources and functions and the importance of whole grains in the body. **\*STEM (Math)**

- a. Define simple carbohydrates (sugars), complex carbohydrates (starches) and fiber.
  - Simple carbohydrates are also called sugars.
  - Complex carbohydrates are also called starches.
  - Fiber is a form of a complex carbohydrate.
- b. Identify and calculate the caloric content of carbohydrates (4 calories per gram) and the functions and food sources for simple and complex carbohydrates.
  - The primary function of carbohydrates is to provide energy.
  - Carbohydrates provide 4 calories per gram.
  - Good sources of complex carbohydrates include: whole grains, cereal products, dried beans, rice and pasta.
  - Carbohydrates include: sucrose (table sugar), fructose (fruit sugar), lactose (milk sugar), maltose (malt sugar) and glucose (blood sugar).
  - The parts of the wheat kernel and the nutrients provided are:
    - Endosperm: starch, protein
    - Germ: unsaturated fatty acids, "B" Vitamins, Vitamin E, iron, zinc, other trace minerals
    - Bran: fiber, vitamins, minerals
- c. Describe how complex carbohydrates break down into simple sugars in the digestion process.

**Objective 2:** Identify fiber, its sources and functions. **\*STEM (Biology)**

- a. Identify the functions and food sources of fiber.
  - Fiber, also known as roughage or cellulose, attracts water to our intestines and moves food through the intestines faster.
  - Fiber helps to keep bowel movements soft in form and reduces problems related to constipation.
- b. Identify cellulose/non-digestible fiber.
- c. Discuss the importance of liquids in the role of bowel function.
  - Drink plenty of liquids, otherwise fiber can slow down or even block normal bowel function.
- d. Discuss why the National Cancer Institute recommends 20-35 grams of daily fiber.

- Fiber may reduce the risks of diverticulosis, colon and rectal cancer.

Resources:

<http://www.cancer.gov/cancertopics/pdq/supportivecare/gastrointestinalcomplications/HealthProfessional/page2>  
[http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/HealthyDietGoals/Whole-Grains-and-Fiber\\_UCM\\_303249\\_Article.jsp#mainContent](http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/HealthyDietGoals/Whole-Grains-and-Fiber_UCM_303249_Article.jsp#mainContent)  
<http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/understanding-carbohydrates/types-of-carbohydrates.html>  
[http://www.cnpp.usda.gov/sites/default/files/dietary\\_guidelines\\_for\\_americans/PolicyDoc.pdf](http://www.cnpp.usda.gov/sites/default/files/dietary_guidelines_for_americans/PolicyDoc.pdf)

- Identify foods high in natural fiber and how to increase the bulk in low-fiber foods.
  - Foods high in fiber: fruits and vegetables (especially the skins or peels), whole grains, legumes, bran cereals, dry beans, nuts, split peas and lentils.

**Objective 3:** Apply food selection and preparation guidelines related to quick breads, rice, grains and pasta. **\*STEM (Math/Science)**

- Identify examples of quick breads: muffins, pancakes, waffles, biscuits, cornbread and nut/fruit bread.
  - Quick breads do not use yeast for leavening.
- Identify basic mixing techniques for quick breads.
  - Under-mixing cause quick breads to be crumbly, dry and have very few tunnels.
  - Over-mixing causes quick breads to be tough and to have tunnels.
- Identify the role of each ingredient contained in quick breads: flour, liquid, leavening agents, fat, salt and sugar.
  - Ingredients and their role in quick breads:
    - Flour: provides structure and is the main ingredient.
    - Liquid: provides moisture.
    - Leavening agents: makes the quick bread rise. Examples of leavening agents include: baking powder, baking soda, eggs and steam.
    - Fat: provides tenderness, richness and some flavor.
    - Salt: provides flavor.
    - Sugar: provide flavor and browning.
- Identify types of rice (brown, instant, long grain and short grain), cooking methods for rice and the ratio of uncooked to cooked rice.
  - Types of rice include: brown, instant, long grain and short grain.
    - Brown rice is the whole grain form of rice.
    - Instant rice is precooked and then dehydrated.
    - Long grain rice stays dry and fluffy.
    - Short grain rice sticks together and is also known as “sticky rice”.
  - Rice Cooking Method:
    - Bring water to a boil.
    - Add rice, cover the pan and reduce heat to a simmer.
    - Do not remove the lid while rice is cooking.
    - One cup of uncooked rice makes three cups of cooked rice. (Ratio is 1:3).
- Identify cooking methods for pasta and the ratio of uncooked to cooked pasta.
  - Pasta dishes are usually low cost entrees.
  - Store dry pasta in a tightly covered container at room temperature. Fresh or cooked pasta should be stored in a closed container in the refrigerator.
  - Pasta Cooking Method:
    - Bring water to a boil.
    - Slowly add pasta so the boiling does not stop.
    - Cook uncovered until pasta is al dente (firm to the tooth), stirring occasionally.
    - One cup of uncooked pasta makes two cups of cooked pasta. (Ratio is 1:2).

### **PERFORMANCE OBJECTIVE 5**

Actively participate in the preparation of a complex carbohydrate food from scratch. Compare the nutritional content and cost of a comparable convenience food vs. the complex carbohydrate food from scratch.

### **STANDARD 4**

**Students will identify the sources and functions of proteins and lipids (fats and oils) and apply appropriate food preparation techniques.**

**Objective 1:** Identify proteins (complete, incomplete and complementary), their sources and functions in the body. **\*STEM (Math/Science)**

- a. Identify and calculate the caloric content of protein (4 calories per gram) and its function in the body.
  - The primary function of protein is to build and repair body tissues.
  - Protein provides 4 calories per gram.
  - Keep meat and poultry portions small and lean.
  - Include at least 8 oz. of cooked seafood per week.
- b. Define amino acids, complete, incomplete and complementary proteins.
  - Amino acids are the building blocks of protein.
  - There are 22 amino acids. 9 are considered essential. The body cannot manufacture essential amino acids so they must be obtained from food.
  - Complete proteins contain all 9 of the essential amino acids in the right ratio for our body to use.
  - Incomplete proteins contain some, but not all, of the amino acids.
- c. Identify food examples of complete, incomplete and complementary proteins.
  - Animal foods source such as meat, chicken, fish and milk products contain complete protein.
  - Soy foods such as tofu, tempeh, soy nuts and edamame also contain complete protein.
  - Quinoa is considered a complete protein, but is not as high in protein as animal sources or soy, so is not included as a protein food in MyPlate.
  - Incomplete proteins are from other plant sources: grains, dried beans, nuts and seeds.
  - Incomplete proteins can be combined to create a complementary protein. For example: beans with rice; peanut butter with whole wheat bread.
  - Complementary proteins are a grain combined with any nut, seed or legume.

**Objective 2:** Apply food selection and preparation guidelines related to egg products. **\*STEM (Science)**

- a. Identify functions of eggs: binder, thickener, coating, leavening agent and emulsifier.
  - Functions of eggs:
  - Binder (Meat loaf)
  - Thickener (Pudding)
  - Coating (Breading on Chicken)
  - Leavening agent (Angel Food Cake)
  - Emulsifier (Mayonnaise)
- b. Identify egg cooking temperatures and techniques/methods.
  - Methods of cooking eggs: hard cooked, soft cooked, scrambled, fried, and poached.
  - Eggs are toughened by heat or by long exposure to heat.
- c. Identify appropriate storage of eggs.
  - Store eggs in the original container in the refrigerator. When properly stored in the refrigerator, eggs may be stored for several weeks.

**Objective 3:** Apply food selections and preparation guidelines related to milk and milk products. **\*STEM (Science/Biology)**

- a. Identify serving sizes and amounts for milk and dairy products.
  - 3 cups from the milk group is recommended for teens and adults.
  - Eat calcium rich foods in the Dairy Group. Switch to fat free or low fat milk.
- b. Discuss methods of cooking with milk. Define pasteurization, homogenization and fortified milk.
  - Milk products scorch easily and need to be cooked at a low temperature with constant stirring.
  - Heating milk in the microwave prevents scorching.
  - Pasteurized milk has been heat treated to remove harmful bacteria.
  - Homogenized milk has had the fat particles broken down and evenly distributed so the fat will not separate from the milk.
  - Milk is fortified with vitamins A and D.
- c. Discuss raw (unpasteurized) milk and milk replacements and how they compare nutritionally.



- Most of the nutritional benefits of drinking raw milk are available from pasteurized milk without the risk of disease that comes with drinking raw milk.
  - Raw milk made into other products like soft cheese, ice cream, and yogurt, can still cause dangerous illnesses. When consuming these products, make sure they are made from pasteurized milk. Raw, unpasteurized milk can carry dangerous bacteria such as Salmonella, E. coli, Campylobacter, and Listeria, which are responsible for causing numerous foodborne illnesses.
  - Milk replacements such as almond milk, soy milk, or rice milk are comparable with milk in regards to nutritional value and are a viable substitute for people with special dietary needs.
- d. Identify methods of lowering fat in recipes by using lower fat content milk or milk products.
- Reduce fat in recipes by using a lower fat content milk. For example: substitute yogurt for mayonnaise or sour cream, substitute fat-free (skim) or low-fat (1%) milk for whole milk.

**Objective 4:** Identify lipids (fats and oils), their sources, functions and related health concerns. **\*STEM (Math/Science/Biology)**

- a. Identify the functions of fats:
- Carrier for vitamins A, D, E, and K.
  - Reserve supply of energy.
  - Adds flavor in food.
  - Protects internal organs from shock and injury.
  - Insulates the body from shock and temperature changes.
  - Promotes healthy skin.
  - Satisfies hunger and helps you feel full longer.
- b. Explain the role of cholesterol, including HDL and LDL factors. (High levels of LDL cholesterol is one factor related to heart disease and obesity.)
- Cholesterol is essential for many body processes. Cholesterol produces hormones and bile acids. It is found in animal tissues, but is never present in plants.
  - The body has High Density Lipoprotein-(HDL) cholesterol and Low Density Lipoprotein-(LDL).
  - HDL cholesterol is considered “good” cholesterol because it transports excess cholesterol found in the blood stream back to the liver. LDL’s take cholesterol from the liver to wherever it is needed in the body. LDL cholesterol is considered “bad” cholesterol because if too much LDL cholesterol is circulating in the blood stream, it can build up in the arteries and increase the chance of heart disease or stroke.
  - High levels of LDL cholesterol is one factor related to heart disease and obesity.
- c. Identify the differences between saturated, monounsaturated, polyunsaturated and trans-fatty acids. Discuss the effect of each type of lipid on HDL and LDL levels.
- Most solid fats are high in saturated fats and are solid at room temperature.
  - Saturated Fats:
    - Raise the LDL and HDL levels of cholesterol in the blood.
    - Examples of saturated fats include: meat, poultry skin, whole milk, tropical oils, butter, shortening and lard.
  - Polyunsaturated Fats:
    - Lower both the LDL and HDL cholesterol levels in the blood.
    - Examples of polyunsaturated fats include: corn oil, soybean oil and safflower oil.
  - Monounsaturated Fats:
    - Lower LDL and raise HDL levels of cholesterol in the blood.
    - Examples of monounsaturated fats include: olive oil, olives, avocados, peanuts and canola oil.
- d. Identify and calculate the caloric content of lipids (9 calories per gram) and methods of lowering lipid content of prepared foods.
- Fats provide 9 calories per gram. It is the most concentrated source of energy.
  - Choose lean meats and lower fat dairy products.
  - Replace solid fats with oils.
  - Oils are not a food group, but they help deliver essential nutrients.

### **PERFORMANCE OBJECTIVE 6**

Actively participate in the preparation of a complete and/or complimentary protein food from scratch. Compare the nutritional content and cost of a comparable convenience food vs. the complete and/or complimentary food from scratch.

### **PERFORMANCE OBJECTIVE 7**

Actively participate in the preparation of a low-fat food. Compare the nutritional content and cost of a comparable high-fat food vs. the low-fat food.

### **STANDARD 5**

**Students will identify the sources and functions of select vitamins, minerals and water and apply appropriate food preparation techniques to foods high in these nutrients.**

**Objective 1:** Identify select vitamins, their food sources, functions and deficiencies in the body. **\*STEM (Math/Science/Biology)**

- a. Identify select water-soluble vitamins (Vitamin C, Folate):
  - Identify sources, functions and deficiency of Vitamin C.
    - Vitamin C: Helps to form collagen which holds the cells together and aids in healing. Prevents scurvy.
  - Identify sources, functions and deficiency of folate including the role of folate in preventing neural tube birth disorders like spina bifida.
    - Folate (folacin/folic acid) is one of the B Vitamins. Folate helps prevent neural tube birth disorders, such as spina bifida. Neural tube damage occurs during the first weeks of pregnancy before a woman may realize she is pregnant. Meeting the folate requirement before becoming pregnant is essential for prevention.
- b. Identify fat-soluble vitamins (Vitamins A, D, E & K):
  - Identify sources, functions and deficiencies of vitamins A, D, E, & K.
    - Vitamin A: Enhances hair, skin and helps prevent night blindness. Sources: Red, orange and dark green vegetables.
    - Vitamin D: Manufactured by the body with exposure to sunlight. Works with the body to build and maintain healthy bones and teeth; usually added to milk products. It is also called the “Sunshine Vitamin”.
    - Vitamin E: Protects membranes of white and red blood cells.
    - Vitamin K: Helps blood to clot.
  - Describe how to identify amounts of Vitamin D in foods using food labels.

**Objective 2:** Identify select minerals, their food sources, functions and deficiencies in the body. **\*STEM (Math/Science/Biology)**

- a. Identify sources, functions and deficiency of the macro mineral calcium, including the role of calcium in preventing osteoporosis.
  - Most minerals help build strong bones and teeth. Others are used to make substances that the body needs.
  - Minerals are usually needed in tiny amounts, but are critical to health.
  - Macro minerals are needed in great quantities in the body.
  - Calcium deficiency causes osteoporosis which causes bones to gradually lose their minerals. This causes bones to become weak and frail. Good sources of calcium are found in dairy products.
- b. Identify sources, functions and deficiency of the trace mineral iron, including the role of iron in preventing anemia. Describe how to identify amounts of iron in foods using food labels.
  - Trace/micro minerals are needed in smaller quantities, but are just as essential as macro minerals. Iron deficiency causes anemia, or low red blood cell formation. Animal products provide excellent sources of iron.
- c. Identify sources, functions and deficiencies of the electrolytes sodium and potassium, including their role in fluid balance. Describe how to identify amounts of sodium and potassium in foods using food labels.

- Electrolytes help maintain the fluid balance in the body, help maintain the heartbeat and help muscle and nerve action.
- Electrolytes easily become imbalanced in cases of dehydration, illness and diarrhea.
- Electrolytes like potassium can be found in bananas and potatoes.
- For sodium there is so much in the food supply that it's more of a concern to have too much. Label reading is a good way to identify which foods have high amounts.
- If an athlete is trying to replace sodium, then some saltier foods are ok and also foods like bread and milk contain some sodium.

**Objective 3:** Identify the functions of water in the body. **\*STEM (Math/Science/Biology)**

- Identify the functions of water:
  - Carries water soluble vitamins.
  - Carries waste through the body.
  - Regulates body temperature through perspiration.
  - Prevents dehydration. Dehydration occurs from lack of water.
- Discuss why water is the most important of all the essential nutrients.
  - Water is the most important of all the essential nutrients.
  - The body cannot survive long without water.
  - Drink water instead of sugary drinks.
- Identify symptoms of dehydration and how to prevent it based on current daily recommendations.
  - Thirst is an indicator of dehydration.
  - Urine should be a pale yellow color. Darker urine is another indication of dehydration.
  - Water prevents dehydration. Drink water and other fluids frequently, don't wait to be thirsty.
  - 64 fl. oz. of water are recommended daily.
- Discuss principles of hydration before, during and after sports and fitness activities
  - For short duration exercise (<60 minutes) water is a good choice to drink before, during and after exercise.
  - For moderate to high intensity activities lasting longer than 60 minutes sports drinks will help replace carbohydrate loss and electrolyte balance.
  - Drink according to thirst during the day and include fluids with meals.
  - Drink 8-20 oz of water an hour before exercise.
  - Continue drinking during exercise, up to 16-24 oz of fluid per hour (4-6 oz every 15 minutes).

Resources: <http://www.scandpg.org/sports-nutrition/sports-nutrition-fact-sheets/>

**Objective 4:** Apply food selection and preparation guidelines related to fruits and vegetables. **\*STEM (Biology/Science)**

- Identify the nutrients provided by fruits and vegetables. (Vitamins, Minerals, Fiber, Water.)
  - Vegetables provide the following nutrients: Vitamin A, Vitamin C, potassium, folic acid, Vitamin D, calcium, magnesium, fiber and water
  - Vegetables contain no cholesterol and are low in calories, fat and sodium.
  - Vary your vegetables.
- Identify how to preserve nutrients in the storage process of fruits and vegetables.
  - Air, heat and water destroy nutrients in vegetables.
  - Wash vegetables to remove pesticides and dirt that might remain on the skin.
- Identify preparation methods to preserve the most nutrients for vegetables and/or fruits:
 

• Eating them raw	• Cook in larger rather than smaller pieces when possible.
• Microwave	• Use small amount of water and cook only until fork tender.
• Steam	• Save the cooking liquid to use in soups or gravies for added nutrients.
• Bake/Roast	
• Stir Fry	
• Simmer	
• Sauté	

- d. Identify how to select fresh, frozen, or canned fruits and vegetables.
  - Select fresh fruits and vegetables that are firm, free from decay, crisp, smooth, dense (heavy for size), free from bruises and have good color.
  - Seasonal fruits and vegetables are lower in cost, plentiful and have better quality.
  - Buy only what you will be able to store and use. They will last about 1 week in the refrigerator.
  - Fruits ripen and spoil faster at room temperature.
  - Choose whole or cut-up fruits more often than fruit juice.
- e. Discuss farm-to-table process.
  - Food doesn't start at the supermarket or restaurant.
  - The five farm to table steps include:
    - Farm (use of good agricultural practices)
    - Processing (monitor at critical control points)
    - Transportation (use clean vehicles and maintain the cold chain)
    - Retail (follow the food code guidelines)
    - Table (always follow the four C's of safety- clean, cook, control cross contamination, chill).  
<http://www.fda.gov/downloads/Food/FoodScienceResearch/ToolsMaterials/UCM430363.pdf>
- f. Discuss how to prevent oxidation of fresh fruits.
  - When most fresh fruit is cut, the surface will turn brown. This is called oxidation and is caused by an enzyme in the fruit.
  - Prevent oxidation of fresh fruits by dipping or covering fruit with liquid containing ascorbic acid. Another way to prevent oxidation is to wait to cut the fruit until ready to eat.

### **PERFORMANCE OBJECTIVE 8**

Actively participate in the preparation of a canned/frozen and/or fresh produce food. Compare the nutritional content and cost of a comparable canned/frozen vs. fresh produce food.

### **STANDARD 6**

**Students will explore the current Dietary Guidelines and ChooseMyPlate.gov.**

**Objective 1:** Identify the six Dietary Guidelines and the key recommendations for each. The guidelines are listed below: **\*STEM (Math/Science/Biology)**

- a. Eat nutrient dense foods.
  - Provides vitamins, minerals and other beneficial substances with relatively few calories.
- b. Balance calories to manage weight.
  - Monitor food and beverage intake, physical activity, and body weight.
  - Reduce portion sizes.
  - When eating out, make better choices.
  - Limit screen time.
- c. Reduce sodium, fats and added sugars, refined grains and alcohol.
- d. Increase vegetables, fruits, whole grains, milk, seafood (8 oz. of seafood per week) and use oils in place of solid fats.
  - Choose seafood products in place of some meat/poultry. (At least 8 oz. per week for teens/adults.)
- e. Build healthy eating patterns that meet nutritional needs over time at an appropriate calorie level.
- f. Include physical exercise as part of healthy eating patterns. (Children and teens should be physically active for at least 60 minutes every day.)
  - Average American diet has more fat, sodium, sugar and calories than recommended.
  - Average American diets are lower in fiber and whole grains than recommended.
  - Salt and sodium are usually added to processed foods and beverages and diet drinks.
  - High consumption of salt and sodium are contributing factors to high blood pressure.  
*(Dietary Guidelines are revised every 5 years; Pending revision in 2015.)*

**Objective 2:** Demonstrate knowledge of MyPlate. (See *ChooseMyPlate.gov*.)

- a. Identify the characteristics of MyPlate:
  - Grains Group (Make half of your grains whole grains.)
    - Choose 100% whole grain cereals, breads, crackers, rice and pasta.
    - Check the ingredients list on food packages to find whole grain foods.
    - Make at least half of your grains whole grains.
  - Protein Group (Keep meat and poultry portions small and lean.)
    - Choose a variety of foods including seafood, beans and peas, nuts, lean meats, poultry and eggs.
    - Keep meat and poultry portions small and lean.
    - Try grilling, broiling, poaching or roasting. These methods do not add extra fat.
  - Vegetable Group (Eat more red, orange and dark green vegetables.)
    - Choose fresh, frozen, canned, or dried fruits and vegetables.
    - Eat more red, orange, and dark green vegetables, such as tomatoes, sweet potatoes, and broccoli in main and side dishes.
  - Fruit Group (Make half your plate fruits and vegetables.)
    - Use fruit as snacks, salads or desserts.
    - Choose whole or cut-up fruits more often than fruit juice.
    - Make half your plate fruits and vegetables.
  - Dairy Group (Switch to low-fat or fat-free dairy products. Get your calcium rich foods.)
    - Low-fat or fat-free dairy products have the same amount of calcium and other essential nutrients as whole milk, but less fat and calories.
    - Switch to low-fat or fat-free dairy products. Get your calcium rich foods.

**Objective 3:** Demonstrate knowledge of healthy eating patterns including MyPlate and Dietary Guidelines. (See *ChooseMyPlate.gov*) \*STEM (Math/Science/Biology)

- a. Explain how all food groups are important to good health.
  - Each food group provides some, but not all of the nutrients you need.
  - No one single food or food group can provide all nutrients.
  - Eating a variety ensures you get all nutrients
- b. Identify the characteristics of healthy eating patterns:
  - Reading and understanding food labels
  - Portion control
  - Functions and caloric value of the 6 nutrients
- c. Explain how people have different caloric needs depending on age, gender and activity level.
- d. Evaluate and analyze a personal dietary intake for one or more days according to the dietary guidelines and MyPlate.

### **PERFORMANCE OBJECTIVE 9**

Evaluate and analyze a personal dietary intake for one or more days according to the dietary guidelines and MyPlate.