iCEV Food Science

Knowledge and Skill Statement	Student Expectation	Breakout	iCEV Citation			
			Narrative/Activity	Type of Citation (New Content/New Citation)	Lesson Title	New Location
(1) The student demonstrates professional standards/employability skills as required by the food service business and industry. The student is expected to:	(D) identify work ethics and professionalism in a job setting;	(i) identify work ethics in a job setting	Narrative	New Content	Professionalism in the Sciences: Food Science	Slides 19-20
(1) The student demonstrates professional standards/employability skills as required by the food service business and industry. The student is expected to:	(D) identify work ethics and professionalism in a job setting;	(i) identify work ethics in a job setting	Activity	New Content	Professionalism in the Sciences: Food Science	Activity-Collaboration Task
(1) The student demonstrates professional standards/employability skills as required by the food service business and industry. The student is expected to:	(E) describe problem-solving and critical-thinking skills used in the workplace; and	(ii) describe critical-thinking skills used in the workplace	Narrative	New Content	Professionalism in the Sciences: Food Science	Slide 21
(4) The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:	(A) develop explanations and propose solutions supported by data and models consistent with scientific ideas, principles, and theories;	(vii) propose solutions supported by data consistent with scientific ideas	Activity	New Content	Communicating Findings in Food Science	Activity-Designing Solutions
(4) The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:	(A) develop explanations and propose solutions supported by data and models consistent with scientific ideas, principles, and theories;	(viii) propose solutions supported by data consistent with scientific principles	Activity	New Content	Communicating Findings in Food Science	Activity-Designing Solutions
(4) The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:	(A) develop explanations and propose solutions supported by data and models consistent with scientific ideas, principles, and theories;	(ix) propose solutions supported by data consistent with scientific theories	Activity	New Content	Communicating Findings in Food Science	Activity-Designing Solutions
(4) The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:	(A) develop explanations and propose solutions supported by data and models consistent with scientific ideas, principles, and theories;	(x) propose solutions supported by models consistent with scientific ideas	Activity	New Content	Communicating Findings in Food Science	Activity-Designing Solutions
(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	(vi) relate the impact of past research on society, including cost-benefit analysis as related to the content	Activity	New Content	Food Packaging Options and Guidelines	Project-Packaging Savvy
(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	(i) analyze the effect of food on the decomposition cycle, including composting	Activity	New Content	Sustainability and Food Production	Project-Sustainability in Food Production Blog Post
(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	(ii) analyze the effect of food on the decomposition cycle, including recycling	Activity	New Content	Sustainability and Food Production	Project-Sustainability in Food Production Blog Post
(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	(iii) analyze the effect of food on the decomposition cycle, including disposal	Activity	New Content	Sustainability and Food Production	Project-Sustainability in Food Production Blog Post
(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;	(iii) describe salts related to food science	Activity	New Content	The Science in Food Preservation	Project-Food Preservation Infographic
(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;	(vii) describe compounds related to food science	Activity	New Content	Scientific Principles: Enzymes	Activity-Mystery Chemicals
(11) The student analyzes the functions of enzymes in food science. The student is expected to:	(C) analyze the functions of enzymes in digestion, including the factors that influence enzyme activity, and relate enzymatic activity in digestion to dietary restrictions; and	(i) analyze the functions of enzymes in digestion, including the factors that influence enzyme activity	Activity	New Content	Scientific Principles: Enzymes	Activity-Digestive Enzyme Flashcards
(11) The student analyzes the functions of enzymes in food science. The student is expected to:	(C) analyze the functions of enzymes in digestion, including the factors that influence enzyme activity, and relate enzymatic activity in digestion to dietary restrictions; and	(ii) relate enzymatic activity in digestion to dietary restrictions	Activity	New Content	Dietary Modifications	Project-Medical Conditions Booklet
(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	(ii) investigate the role of phase changes in food production, including coagulation	Activity	New Content	Heat and Food Production	Activity-Sourdough Analysis
(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	(iii) investigate the role of phase changes in food production, including reduction	Activity	New Content	Heat and Food Production	Activity-In the Kitchen: Sauces
(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.	(i) demonstrate rates of reaction using various temperatures	Activity	New Content	Scientific Principles: Chemical Properties	Activity-Reaction Rate Race
(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;	(i) describe the functions of carbohydrates in food production	Activity	New Content	Food Science: Carbohydrates	Project-Food Lab: Pudding

iCEV Food Science

Knowledge and Skill Statement	Student Expectation	Breakout	iCEV Citation			
			Narrative/Activity	Type of Citation (New Content/New Citation)	Lesson Title	New Location
(16) The student evaluates the properties of carbohydrates in food and their effects on food production. The student is expected to:	(D) create food products using simple and complex carbohydrates.	(ii) create food products using complex carbohydrates	Activity	New Content	Heat and Food Production	Activity-In the Kitchen: Sauces
(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	(i) develop recipes for dietary differences or for personal health preferences	Activity	New Content	Dietary Modifications	Activity-Recipe Review
(21) The student explains nutritional aspects of food production. The student is expected to:	(D) plan and create a dining experience using the most recent USDA dietary guidelines.	(ii) create a dining experience using the most recent USDA dietary guidelines	Activity	New Content	Understanding Dietary Guidelines	Activity-Find a Recipe
(23) The student examines packaging and labeling guidelines. The student is expected to:	(C) analyze the effectiveness of commercial food packaging for specific foods.	(i) analyze the effectiveness of commercial food packaging for specific foods	Activity	New Content	Food Packaging Options and Guidelines	Activity-Food Packaging Guidelines

Work Ethic

- Is a set of beliefs focused on completing work and the ability to work hard
- Characteristics in a job setting may include the following:
  - −discipline
    - ability to exceed expectations to learn new skills
  - −dedication
    - ability to focus on tasks that need to be completed
  - −integrity
    - Ability to be honest and polite

Work Ethic

- Examples within a job setting include:
  - −being on time
  - −willingness to take on new tasks
  - −maintaining organization
  - −taking responsibility for mistakes

Collaboration Task

Activity Overview:
You will utilize collaboration skills to create a presentation to share your team's solutions to one of the issues below.

Directions:

1. Your instructor will divide the class into groups of three to four.

2. Develop a team SMART goal and establish at least three team norms.

3. Identify the issue your team will focus on. Examples include:
    - Food insecurity
        - how can we feed nine billion people in 2050
    - Depleting fresh water sources
        - how should we manage dwindling fresh water supplies
    - Food safety
        - is the meat we eat contaminated with growth hormones
    - Ethics
        - is it unethical/immoral to consume animal products

4. Develop a presentation detailing your solution.

5. After developing your solution, rate the group on the following components of successful collaboration:
    - Relational trust
    - Collective responsibility
    - Clear purpose
    - Time
    - Communication
    - Work ethic

6. Submit your presentation and ratings to your instructor.

Critical Thinking

- Is an individual's ability to analyze a problem objectively and make a logical decision based on the evidence presented
- In a job setting may occur in the following examples:
  - researching a solution to a problem
  - analyzing data based on lab results
  - developing an understanding of a colleague's viewpoint

iCEV

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Designing Solutions

Activity Overview:

You will consider a problem or issue in the field of food science in order to design a solution for the issue.

Directions:

1. Use the internet and other resources to locate a problem or issue in the field of food science. Be sure to check in with your instructor to have your chosen issue approved and record the problem in the space provided.

2. Research and list, in the space provided, three possible solutions to the problem. Pay attention to solutions based on data, scientific ideas, principles or theories.

3. Choose one solution from the list and detail how the solution can be implemented. This could include sketches of models, detailed processes or precise procedures. Detail how the solution is supported by data, scientific ideas, principles or theories.

4. Write a description of your solution and propose how it will help solve the issue identified in step one.

5. Form small groups according to your instructor's directions, and share the identified problem and possible solution.

6. Turn in your completed activity as directed.

Proposed Problem:

Write out the problem you are choosing to address.

Possible Solutions:

1.

2.

3.

Proposed Solution Details:

Proposed Solution Explanation:

Packaging Savvy

Project Overview:
You will act as a package designer for a food item and develop the covering for the package using graphic design or presentation software.

Directions:

1. Select a food you would like to design a package for.

2. Take note of any characteristics you would like the packaging to have, such as the packaging material and the level of containers needed. Keep in mind food packaging guidelines, sustainability and the cost of materials.

3. Research food products and the packaging used to understand the cost of commercial packaging, how packaging has evolved over time, and the effects of food packaging on society, such as recycling and disposal.

4. Conduct a cost-benefit analysis for the packaging material to select the best option based on your budgetary needs, design preferences and the disposability.

5. With a graphic design or presentation software, develop the covering and outside of the package for your food item.

6. Be sure to meet the exact needs for the packaging type of the food product you chose.

7. Write a brief summary explaining your findings and why you chose your food product packaging. Describe the findings of your cost-benefit analysis and the impact of the food packaging you chose.

8. Once complete, submit your project according to your instructor's directions.

Packaging Savvy

Rubric

Description	Possible Points	Your Score
Research & Organization: • Information was presented in a logical organized manner	35	
Concept & Understanding: • Understanding of the concept is clearly evident • Effective strategies were used to achieve the end product • Logical thinking was utilized to arrive at the conclusion	35	
Creativity/Craftmanship: • End product is unique and reflects the student's or group's individuality • End product is clearly high quality	15	
Production/Effort: • Class time provided for the project was used efficiently • Time and effort are evident in the execution of the end product	15	
Total Points	100	

Additional Comments:

Sustainability in Food Production Blog Post

Project Overview:
You will create a blog post about the effect of food on the decomposition cycle including compositing, recycling and disposal.

Directions:

1. Using the internet, library or any available resource, begin researching the topic and gathering sources. Here are some questions to consider:
    - Describe the decomposition cycle
    - How does food impact the decomposition cycle
    - What does proper composting of food look like
    - What are examples of items that should not be composted and explain why
    - How does recycling impact the decomposition cycle
    - Explain the process of proper disposal of food
    - Describe food examples which should be composted, recycled and which maybe be disposed

2. Begin outlining your post. Locate relevant links, images and other media which will be included. Keep in mind who the audience is and include various types of multimedia elements, such as gifs, links and videos.

3. Write your blog post.

4. Create your blog post and proofread/edit your writing. Make sure to cite/credit your sources where necessary.

5. Publish your blog post onto an individual site or on a class blog website.

6. Once completed, turn in your project according to your instructor's directions.

Food Preservation Infographic

Project Overview:
You will create an infographic about each of the food preservation methods discussed in the lesson.

Directions:

1. Create an infographic dedicated to food preservation and include the following methods:
    - Dehydration
    - Canning
    - Freezing
    - Pasteurization

2. Use a design program of your choice, or use supplies, such as paper or poster board, to create your infographic.
    - You may choose to create one large infographic or individual infographics for each preservation method

3. The infographic should include descriptions of the following for each perseveration method:
    - Process of the preservation method
    - Describe how salts may be used in food preservation
    - Which method of food preservation uses salt and why
    - Pictures of the foods before and after preservation
    - Personal versus commercial preservation methods
    - Pros and cons of the preservation method
    - Foods best suited for the preservation method and why

4. Once complete, submit your project according to your instructor's directions.

Food Preservation Infographic

Rubric

Description	Possible Points	Your Score
Research & Organization: • Proper research was conducted to complete the assignment • Sources were cited appropriately based on instructions provided • Information was presented in a logical organized manner	35	
Concept & Understanding: • Understanding of the concept is clearly evident • Effective strategies were used to achieve the end product • Logical thinking was utilized to arrive at the conclusion	35	
Creativity/Craftmanship: • End product is unique and reflects the student's or group's individuality • End product is clearly high quality	15	
Production/Effort: • Class time provided for the project was used efficiently • Time and effort are evident in the execution of the end product	15	
Total Points	100	

Additional Comments:

Mystery Chemicals

Activity Overview:
In a group, you will study the substances provided by your instructor in order to classify them.

Directions:

1. Your instructor will divide the class into groups of two or three.

2. Each group will be provided with six substances to classify.

3. Using the choices below, classify each substance as one of the three types:
   - Homogenous mixture
   - Heterogeneous mixture
   - Pure substance

4. Turn in based as directed.

Substance 1:
Homogenous Mixture Heterogeneous Mixture Pure Substance

Substance 2:
Homogenous Mixture Heterogeneous Mixture Pure Substance

Substance 3:
Homogenous Mixture Heterogeneous Mixture Pure Substance

Substance 4:
Homogenous Mixture Heterogeneous Mixture Pure Substance

Substance 5:
Homogenous Mixture Heterogeneous Mixture Pure Substance

Substance 6:
Homogenous Mixture Heterogeneous Mixture Pure Substance

Describe the differences between elements, compounds and mixtures.

Digestive Enzyme Flashcards

Activity Overview:
You will develop a set of flashcards describing digestive enzymes.

Directions:

1. Using index cards, develop a set of flashcards to describe each of the digestive enzymes. Your flashcards should include:
    - Name of the enzyme
    - Source of the enzyme
    - Type of food the enzyme helps digest
    - Product the enzyme produces
    - Functions of the enzyme in digestion
    - Factors that influence enzyme activity

2. After everyone in the class is finished, break into pairs and quiz each other with the flashcards.

3. Take note of any enzymes you need to study further.

4. Submit your flashcards according to directions.

Medical Conditions Booklet

Project Overview:
You will create a booklet for a food-related medical condition.

Directions:

1. Your instructor will divide the class into groups of three.

2. Your group will research one of the following food allergies, intolerances or other medical conditions:
    - Peanut allergy
    - Shellfish allergy
    - Dairy intolerance
    - Gluten intolerance
    - Celiac disease
    - Irritable Bowel Syndrome

3. Create a booklet for your condition with the following items:
    - Describe the food allergy, intolerance or other medical condition
    - Describe the relation of enzymatic activity in digestion and the condition
    - How common is this condition
    - How fatal can this condition be
    - What dietary restrictions or alterations can be made instead of using the product causing the complication
    - What are symptoms which could occur if the product is consumed
    - What treatment methods should be followed if the product is consumed
    - If associated with the FASTER Act, describe the protocols which must be taken

4. Share your booklet with your classmates.

5. Once complete, submit your booklet according to your instructor's directions.

Medical Conditions Booklet

Rubric

Description	Possible Points	Your Score
Research & Organization: • Proper research was conducted to complete the assignment • Sources were cited appropriately based on instructions provided • Information was presented in a logical organized manner	35	
Concept & Understanding: • Understanding of the concept is clearly evident • Effective strategies were used to achieve the end product • Logical thinking was utilized to arrive at the conclusion	35	
Creativity/Craftmanship: • End product is unique and reflects the student's or group's individuality • End product is clearly high quality	15	
Production/Effort: • Class time provided for the project was used efficiently • Time and effort are evident in the execution of the end product	15	
Total Points	100	

Additional Comments:

Sourdough Analysis

Activity Overview:
You will observe the pictures you acquired while baking your sourdough and compare the unbaked dough to the bread.

Directions:

1. Gather the photos you took prior to baking and throughout the baking process. The photos were taken during the **Food Lab: Sourdough Project** in the Leavening Process lesson.

2. Insert these photos into the spaces provided.

3. Answer the questions.

4. Turn in based on your instructor's directions.

Insert your pictures in the corresponding box below.

Before	Final product
First 10 Minutes	Halfway baked
30 minutes baked	10 minutes left

Sourdough Analysis

1. Which heat transfer method was used during this process? Explain your answer.

2. Which phase changes have occurred once the dough has baked? Explain your answer.

3. Are these phase changes physical or chemical changes? Explain your answer.

4. Describe the dough's appearance and texture prior to baking.

5. Describe how coagulation occurs in sourdough. Describe how phase changes impact this process.

Sourdough Analysis

6. Describe the dough's appearance and texture once baked.

7. What created the holes you see inside the baked loaf?

8. What phase change is allowing the holes to hold their shape?

9. If you were to make sourdough again, what would you do differently?

10. If you were to make sourdough again, what would you keep the same?

11. Overall, how do you feel you performed throughout this food lab process?

In the Kitchen: Sauces

Activity Overview:
Mise en place each of the recipes included and prepare the sauce.

Directions:

1. Gather the needed ingredients for each recipe.

2. Create each recipe.

3. Answer the reflection questions.

4. Turn in the reflection questions to your instructor.

In the Kitchen: Sauces

Sauce *Béchamel* (makes approximately 1 quart)

Ingredients:

- 3 ounces white *roux* (cooled)
- 5 cups whole milk
- 1/4 onion peeled
- 1 bay leaf
- 2 cloves
- kosher salt to taste
- white pepper to taste
- 1/16 teaspoon of ground nutmeg

Preparation:

1. In a heavy-bottomed saucepan, bring the milk to a simmer over a medium heat, stirring occasionally and taking care not to let it boil.
2. Using a wire whisk, slowly add the cooled *roux* to the hot milk, whisking vigorously to make sure it is free of lumps.
3. Now stick the pointy end of the clove through the bay leaf into the onion and drop them into the sauce.
4. Simmer for about 20 minutes or until the total volume has reduced by about 20 percent, stirring frequently to make sure the sauce does not scorch at the bottom of the pan.
5. The resulting sauce should be smooth and velvety. If it is too thick, whisk in a bit more milk until it is just thick enough to coat the back of a spoon.
6. Remove the sauce from the heat. You can retrieve the clove-stuck onion and discard it now.
7. Season the sauce very lightly with salt and white pepper.
8. The sauce is ready to serve now or it may be cooled rapidly and refrigerated for later use.

In the Kitchen: Sauces

Sauce *Velouté* (makes approximately 1 quart)

Ingredients:

- 2 fluid ounces olive oil
- 1 quart of white stock (chicken, fish or white beef)
- 3 ounces blonde *roux*
- 4 ounces white *mirepoix* (equal parts onion, celery, leek)
- 1 *sachet d'épice* (3 or 4 parsley stems, 1 sprig thyme, 1 bay leaf, 1 teaspoon cracked peppercorn)
- salt to taste
- white pepper to taste

Preparation:

1. Heat the oil in a saucepan over medium heat.
2. Add the *mirepoix* and cook, stirring from time to time, until the onions are limp and have begun to release their juices into the pan; about 2 or 3 minutes. They may take on a light golden color but should not be allowed to brown.
3. Add the *roux* to the *mirepoix* and cook until the *roux* is very hot; about 1 minute.
4. Add the stock to the pan gradually, stirring or whisking to work out any lumps.
5. Bring to a full boil, then lower the heat to establish a simmer.
6. Add the *sachet d'épice* and continue to simmer, skimming as necessary, until a good flavor and consistency develop and the starchy feel and taste of the flour has cooked away; about 30 to 40 minutes.
7. Strain the sauce through a fine-mesh sieve.
8. Strain a second time through a double thickness of rinsed cheesecloth, if desired, for the finest texture.
9. Return the sauce to a simmer.
10. Taste the sauce and season with salt and pepper.
11. Finish the sauce as desired.
12. The sauce is ready to serve now or it may be cooled rapidly and refrigerated for later use.

In the Kitchen: Sauces

Sauce Espagnole (makes approximately 1 quart)

Ingredients:

- 2 fluid ounces olive oil
- 1/2 ounce tomato paste
- 1 quart of brown stock
- 3 ounce brown *roux* (cooled)
- 4 ounce traditional *mirepoix* (equal parts onion, celery, carrot)
- 1 *sachet d'épice* (3 or 4 parsley stems, 1 sprig thyme, 1 bay leaf, 1 teaspoon cracked peppercorn)
- salt to taste
- ground black pepper to taste

Preparation:

1. Heat the oil in a saucepan over medium heat and add the *mirepoix* ingredients and *sauté* until the onions are translucent and continue to brown; about 2 or 3 minutes.
2. Add the tomato paste and cook until it turns a burnt orange color and has a sweet aroma; 1 to 3 minutes.
3. Add the *roux* to the saucepan and let it incorporate for a minute and then add the brown stock and whisk on high heat.
4. Get the mixture to a simmer and add the *sachet d'épice* .
5. Season the sauce with the salt and pepper.
6. Continue whisking.
7. Simmer for about 45 minutes.
8. Strain the sauce.
9. The sauce is ready to serve now or it may be cooled rapidly and refrigerated for later use.

In the Kitchen: Sauces

Tomato Sauce (makes approximately 1 quart)

Ingredients:

- 2 fluid ounces olive oil
- 16 ounces *concassé* chopped tomato
- 4 ounces onions
- 2 ounces minced garlic
- 1 ounce fresh chopped basil
- salt to taste
- ground black pepper to taste

Preparation:

1. Heat oil in a saucepan over medium heat and add the onion and garlic are; about 2 or 3 minutes.
2. Add the tomatoes and stir on high heat and let the tomatoes begin to sweat. Keep stirring the mixture.
3. Add the salt and pepper and continue stirring. Bring the mixture to a simmer for about 5 minutes.
4. Add the fresh basil when the mixture is beginning to be liquid. Allow the mixture to simmer and reduce down for about 10 minutes (time can vary based on how thick you want the sauce).
5. Slowly pour the mixture into a food mill and grind down the ingredients to make a *purée* like sauce. Be sure and get all of the ingredients used into the food mill.
6. The sauce is ready to serve now or it may be cooled rapidly and refrigerated for later use.

In the Kitchen: Sauces

Hollandaise Sauce (makes approximately 4 servings)
This recipe differs from the recipe used in the presentation.

Ingredients:

- 4 egg yolks
- 3 1/2 tablespoons lemon juice
- ground white pepper to taste
- 1/8 teaspoon Worcestershire sauce
- 1 tablespoon water
- 1 cup butter, melted
- 1/4 teaspoon salt

Preparation:

1. Fill the bottom of a double boiler with water; about half full. Make sure water does not touch the top pan.
2. Bring water to a gentle simmer.
3. In the top of the double boiler, whisk together egg yolks, lemon juice, white pepper, Worcestershire sauce and 1 tablespoon water.
4. Add the melted butter to egg yolk mixture 1 or 2 tablespoons at a time while whisking yolks constantly.
5. If hollandaise begins to get too thick, add a teaspoon or two of hot water.
6. Continue whisking until all butter is incorporated.
7. Whisk in salt, then remove from heat.
8. Place a lid on pan to keep sauce warm until ready to serve.

Source:
http://allrecipes.com/recip/creamy-hollandaise-sauce/

In the Kitchen: Sauces

Reflection Questions

1. Describe the basic components of a sauce including liquid, thickening agents and additional flavors..

2. Describe the differences of thickening agents used in making sauces.

3. Explain the role of phase changes when making sauces. Define reduction.

Reaction Rate Race

Activity Overview:
You will identify chemicals within familiar foods and predict what type of chemical reaction you believe occurs in the production of those foods.

Directions:

1. You will be divided into four groups.

2. Your group will be provided with four antacid tablets and four glasses of water. The glasses of water will each contain a specific amount and be a certain temperature.

3. Compare the reaction rates of the antacid tables in water with:
   - Changes to the surface area of the antacid
   - Change of water temperature
   - Amount of water
   - Any other variables which could affect reaction rates

4. Write a short summary about the comparisons your group made with each antacid and glass of water.

5. Turn in your summary to your instructor.

Food Lab: Pudding

Project Overview:
You will experiment with the effects carbohydrates have on food production by creating pudding.

Directions:
1. Answer the pre-lab questions.

2. Gather the needed ingredients and materials.

3. Follow the procedures to create pudding.

4. Answer the post-lab questions.

5. Turn in based on your instructor's directions.

Pre-Lab Questions
1. What type of carbohydrates are amylose and amylopectin?

2. Describe the functions of carbohydrates in food production.

3. In what way can starch alter food production?

4. Explain the process of gelatinization and retrogradation in your own words.

Recipe
8 servings
Prep/cooking time: 10 minutes
Cooling time: 20 minutes
Source : https://www.spendwithpennies.com/chocolate-pudding/

Ingredients	Materials
• 1 1/3 cups sugar • 2/3 cup cocoa powder • 1/3 cup cornstarch • 4 1/2 cups cold milk • 3 tablespoons butter • 1 teaspoon vanilla • Pinch of salt	• Medium saucepan • Measuring utensils • Wooden spoon • Whisk • Storage container with lid, or plastic food wrap

1. In a saucepan, combine sugar, cocoa powder, salt and cornstarch. Mix until combined.

2. Add in cold milk, whisk until combined.

3. Transfer pot to stove and heat over medium heat. Stir constantly until mixture reaches a boil.

4. Allow mixture to boil for 1 minute while stirring constantly.

5. Remove from heat and stir in butter and vanilla.

6. Transfer to a storage container and place a lid or plastic wrap on top.

7. Allow mixture to cool to room temperature then place it in the refrigerator.

8. Let chill overnight or until it has set.

Post-Lab Questions

1. What ingredient served as the carbohydrate in this recipe?

2. What role did each carbohydrate have in creating the final product?

3. What process occurred for the mixture to thicken into a pudding like texture?

Rubric

Description	Possible Points	Your Score
Organization: • Pre-lab questions were thoroughly answered • Information was presented in a logical organized manner	25	
Concept & Understanding: • Understanding of the concept is clearly evident • Effective strategies were used to achieve the end product • Procedures followed correctly • Post-lab questions were thoroughly answered	25	
Creativity/Craftmanship: • End product is unique and reflects the student's or group's individuality • End product is clearly high quality	25	
Production/Effort: • Class time provided for the project was used efficiently • Lab station cleaned properly • Time and effort are evident in the execution of the end product	25	
Total Points	100	

Recipe Review

Activity Overview:
You will alter recipes to comply with medical condition needs.

Directions:

1. View the recipes on the following pages.

2. Using the presentation and other resources, determine alternatives for the problem foods in each recipe. The foods vary, and there could be more than one substitution needing to be made.

3. Read the scenario and answer the question following each recipe.

4. Develop a recipe based on the scenario.

5. Once complete, submit your activity according to your instructor's directions.

Recipe Review

Recipe 1: Banana Bread
Ingredients:

- 1 1/4 cups all-purpose flour
- 1 teaspoon baking soda
- 1/2 teaspoon salt
- 2 large eggs
- 1/2 teaspoon vanilla extract
- 1/2 cup unsalted butter
- 1 cup sugar
- 3 very ripe bananas, peeled, and mashed with a fork (approximately 1 cup)
- 1/2 cup toasted walnut pieces

Scenario
Hannah is attempting to make banana bread for the first time. She would like a recipe to be gluten-free and contain no nuts, due to her mother's health concerns. What recommendations would you give Hannah for altering her recipe?

Adapted From:
https://www.foodnetwork.com/recipes/food-network-kitchen/banana-walnut-bread-recipe-2011439

Recipe Review

Recipe 2: Chocolate Chip Cookies
Ingredients:

- 2 1/4 cups all-purpose flour
- 1 teaspoon baking soda
- 1/2 teaspoon salt
- 1 cup butter, softened
- 3/4 cup granulated sugar
- 3/4 cup packed brown sugar
- 1 egg
- 1 teaspoon vanilla
- 2 cups semisweet chocolate chips
- 1 cup coarsely chopped nuts, if desired

Scenario
Bailey is making chocolate chip cookies for her class party. There are students in her class with nut allergies, as well as dairy intolerances. What recommendations would you give Bailey for altering her recipe?

Adapted From:
https://www.bettycrocker.com/recipes/ultimate-chocolate-chip-cookies/77c14e03-d8b0-4844-846d-f19304f61c57

Recipe Review

Recipe 3: Homemade Spaghetti
Ingredients:

- 1 pound ground beef
- 1 medium onion, chopped
- 4 cloves garlic, minced
- 1 small green bell pepper, diced
- 1 (28 ounce) can diced tomatoes
- 1 (16 ounce) can tomato sauce
- 1 (6 ounce) can tomato paste
- 2 teaspoons dried oregano
- 2 teaspoons dried basil
- 1 teaspoon salt
- 1/2 teaspoon ground black pepper
- 1 package of spaghetti

Scenario
Mateo would like to make spaghetti to surprise his mom after a long week. His mother has celiac disease; therefore, he needs to stay clear of products with gluten. What recommendations would you give Mateo for altering his recipe?

Adapted From:
https://www.allrecipes.com/recipe/158140/spaghetti-sauce-with-ground-beef/

Recipe Review

Recipe 4: Crispy Chicken Wrap
Ingredients:

- 1 1/4 pound bag of frozen crispy chicken strips
- 4 flour tortillas
- 2 cups of shredded lettuce
- 1 cup carrot, shredded
- 1/2 red bell pepper, thinly
- 2 cups shredded cheddar cheese
- 3/4 cup barbeque sauce

Scenario
Noah is making chicken wraps for his lunch. He has been working to maintain a healthy diet by eating low-fat and gluten-free options. He found a recipe online and would like to alter it to meet his nutritional needs. What recommendations would you give Noah for altering his recipe?

Adapted from:
https://www.foodnetwork.com/recipes/asian-crispy-chicken-wrap-3414408

Recipe Review

Develop a Recipe

You are having friends over for dinner and will be making pizza. Xander has a dairy intolerance, Mya does not like black olives and Silas prefers to maintain a low-fat diet. Develop a recipe for pizza that meets the dietary restrictions and preferences. Include all ingredients and measurements.

Find a Recipe

Activity Overview:
You will locate two similar recipes to compare to understand dietary guidelines.

Directions:

1. Your instructor will divide the class into groups of two.

2. Using all available resources, research and select two recipes to compare. One recipe should fit into the dietary guidelines and the other should not fit into the dietary guidelines.

3. Conduct additional research to gather the following information for both recipes:
   - The recipe
   - Total calories
   - Total amount of grain
   - Total amount of dairy
   - Total amount of fruits
   - Total amount of vegetables
   - Total amount of protein
   - Total amount of sugar
   - Total amount of saturated fat

4. Create a poster comparing the information you found for each of the recipes. Be sure to include:
   - Titles
   - Labels
   - Headings
   - Descriptions

5. Develop a citation sheet listing all sources used.

6. Share your poster with the class and be prepared to answer questions.

7. Create a dining experience with the recipe you found that follows the recent dietary guidelines.

Food Packaging Guidelines

Activity Overview:
You will create a slideshow presentation explaining packaging guidelines.

Directions:

1. Research the packaging type and guidelines for at least three foods of your choosing.

2. Compile a list of at least ten packaging guidelines which must be followed by the producer. Be sure to answer the following:
    - Which organization regulates the product
    - How do the U.S. packaging guidelines differ from global regulations for this item
    - How does the package protect against contamination of microorganisms
    - Are there size, shape and weight requirements which have to be met
    - How regulations have impacted the effectiveness of commercial food packaging

3. Create a slideshow presentation to demonstrate your findings. Your presentation should include at least ten slides explaining each guideline and why it is important for the safety and preservation of the food.

4. Once complete, submit your activity according to your instructor's directions.