

Food Science

Grades 11-12: Learning Outcomes and Targets

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Course Overview:

The course reviews scientific concepts governing food as well as providing a general overview of the development of food, factors affecting food consumption, trends and culture. The goals of the semester course are to help students understand how ingredients interact and function with certain foods. The students spend time in the foods lab experimenting with ingredients as well as on their own with individual homework and projects.

Learner Outcome #1 - Students will state the background to food production and careers associated with food science.

Time Duration: (3 weeks)

Targets to be covered

Students will be able to:

1. Define Food Science - The study of the nature of food, causes of deterioration the principles underlying food processing and the improvement of foods for the consuming public.
2. Know careers associated with Food Science
3. How food is processed - early discoveries of food
4. Lab - homemade vs store bought (with reflection)

Assessment:

- Notes
- Article/Questions
- Lab/Reflection
- Guest Speaker (army - MRE - science based)
- Quiz

Learner Outcome #2 - Students will interpret how human senses impact food consumption as well as influences on food choices.

Time Duration: (2 weeks)

Targets to be covered

Students will be able to:

1. Influences on food likes and dislikes
2. Sensory characteristics of food products
3. Taste test panels - reflection
4. Lab - imitation vs real

Assessment:

- Notes
- Questions/homework
- Lab/Reflection
- Quiz

Learner Outcome #3 - Students will assess how substitute ingredients impact their food choices and overall health.

Time Duration: (3 weeks)

Targets to be covered

Students will be able to:

1. Define food analogs and list the four main functions
2. Distinguish between nutritive and nonnutritive sweeteners
3. Compare the pros and cons of food analogs
4. Labs (sugar substitute, fat substitute) & Evaluation

Assessment:

- Notes
- Questions/Homework
- Sugar assignment (computer lab) & Presentation
- Quiz

Learner Outcome #4 - Students will list the essential vitamins and minerals as well as apply those concepts in the amount needed for the human body to function properly.

Time Duration: (3 weeks)

Targets to be covered

Students will be able to:

1. Differentiate between fat-soluble vitamins and water-soluble vitamins
2. List functions and sources of major minerals
3. Explain the impact of food processing and preservation methods have on the nutritive value of food.
4. Lab - fat-soluble vitamins/reflection
5. Lab - mineral - potassium/reflection

Assessment:

- Notes
- Vitamin Packet/Questions
- Vitamin boards - project
- Quiz

Learner Outcome #5 - Students will define the functions of proteins in food and analyze how it affects the outcome of food products.

Time Duration: (3 weeks)

Targets to be covered

Students will be able to:

1. Identify the functions of proteins in food production
2. Contrast nutritional use of amino acids - essential vs nonessential
3. Contrast complete vs. incomplete proteins
4. Lab - protein foam/reflection (angel food cake)
5. Lab - cooking protein/reflection (egg lab)

Assessment:

- Notes
- Questions/Homework
- Protein presentations (student work)
- Quiz

Learner Outcome #6 - Students will recognize the functions of additives and how they produce desired characteristics in foods.

Time Duration: (4 weeks)

Targets to be covered

Students will be able to:

1. Differentiate between intentional and incidental food additives
2. State the role of the Food and Drug Administration in regulating additives
3. Describe the four main functions of additives
4. List the physical effects of caffeine on the body and the daily recommendations for consumers.
5. Lab - caffeine (chocolate)/reflection
6. Identify how additives enhance sensory characteristics - coloring agents & flavoring agents)
7. Lab - natural flavoring agents (poppyseed)
8. Lab - fruit-flavored candies
9. Identify how additives control product consistency - leavening agents
10. Lab - yeast (leavening agent)

Assessment:

- Notes
- Questions/Homework
- Quiz