Unit 6 The Microbiology of Food Processing

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Course(s): **Food Science**
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Title Section

Department of Curriculum and Instruction

Belleville Public Schools

Curriculum Guide

Food Science

Grades 10-12

Belleville Board of Education

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Unit Overview

In Unit 6 The microbiology of food processing Students wil learn the following:

- How to keep food safe.
- Microorganisms that cause food spoilage.
- Identify sources and symptons of foodborne illness.
- Explain the role of various goverment agencies that keep the food supply safe.
- The benefits dehydrated foods
- How to store food properly.
- Why different foods require different methods of processing.
- Different types of commercial canning methods.
- How to make canned foods part of a healthful diet.
- Identify and describe commercial freezing methods.
- How to choose and package foods for freezing at home.
- How to incorporate frozen food in a healthy diet.

NJSLS

9.3.12.AG	Agriculture, Food & Natural Resources
9.3.12.AG-ANI	Animal Systems
9.3.12.AG-FD	Food Products & Processing Systems
9.3.12.AG-NR	Natural Resources Systems
9.3.12.AG-PL	Plant Systems
CAEP.9.2.8.B	Career Exploration
CAEP.9.2.8.B.1	Research careers within the 16 Career Clusters ® and determine attributes of career success.
CAEP.9.2.8.B.2	Develop a Personalized Student Learning Plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.
CAEP.9.2.8.B.3	Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career.
CAEP.9.2.8.B.5	Analyze labor market trends using state and federal labor market information and other resources available online.
CAEP.9.2.8.B.6	Demonstrate understanding of the necessary preparation and legal requirements to enter the workforce.
CAEP.9.2.8.B.7	Evaluate the impact of online activities and social media on employer decisions.

Exit Skills

AT the end of unit 6 SWDAT identify and evaluate the following:

- How to keep food safe.
- How to prevent food borne illness
- Food safety control.
- Microorganisms that cause food spoilage.
- Identify sources and symptons of foodborne illness.
- Age groups that are of high concern with food borne illness
- Explain the role of various goverment agencies that keep the food supply safe.
- The benefits dehydrated foods
- How to store food properly.
- Why different foods require different methods of processing.
- Different types of commercial canning methods.
- How to make canned foods part of a healthful diet.
- Identify and describe commercial freezing methods.
- How to choose and package foods for freezing at home.
- How to incorporate frozen food in a healthy diet.

Enduring Understanding

ENduring Understanding at the end of Unit 6 the microbiology of food processing?

- Careers that are aviable in food science and related careers.
- Demonstrate competence in speaking and listening as tools for learning.
- Demonstrate competence in the general skills and strategies of the writing process.
- Identify microorganisms,pathogens and bacteria.
- Food borne illnesses are preventable.
- Certain foods are time and temperature controlled for safety.
- Proper personal hygiene practices are essential for avoiding food borne illness.
- Food pathogens are easily spread from one source to another.
- Food processing play a major role in the spread of bacteria.
- How to store food properly.
- Why different foods require different methods of processing.
- Different types of commercial canning methods.
- How to make canned foods part of a healthful diet.
- Identify and describe commercial freezing methods.
- How to choose and package foods for freezing at home.
- How to incorporate frozen food in a healthy diet.

Essential Questions

Essential Question: Unit 6 The Microbiology of food processing

- Which Careers are avalable in food science and related careers?
- How do you identify microorganisms,pathogens and bacteria that are related to food?
- How do you prevent Food borne illnesses ?
- Which foods are time and temperature controlled for safety?
- Why is proper personal hygiene practices are essential for avoiding food borne illness?
- How are food pathogens spread from one source to another?
- What role does Food processing play in the spread of bacteria?
- Why is it important to store food to store food properly?
- Why do different foods require different methods of processing?
- What are the different types of commercial canning methods?
- How can you make canned foods part of a healthful diet?
- Why is it imortsnt to undertand ,Identify and describe commercial freezing methods?
- How can you choose and package foods for freezing at home?

- How can you incorporate frozen food in a healthy diet?

Learning Objectives

Tips on Writing Good Learning Objectives

Bloom's Taxonomy

Applying Bloom's Taxonomy to Learning Objectives

Effective learning objectives need to be observable and/or measureable, and using action verbs is a way to achieve this. Verbs such as "identify", "argue," or "construct" are more measureable than vague or passive verbs such as "understand" or "be aware of". As you develop your syllabus focus on articulating clear learning objectives and then use these objectives to guide class assignments, exams and overall course assessment questions.

Sample Learning Objectives for a Lower Division Course

After completing Nutrition 101 *Humans and Food*, students will be able to:

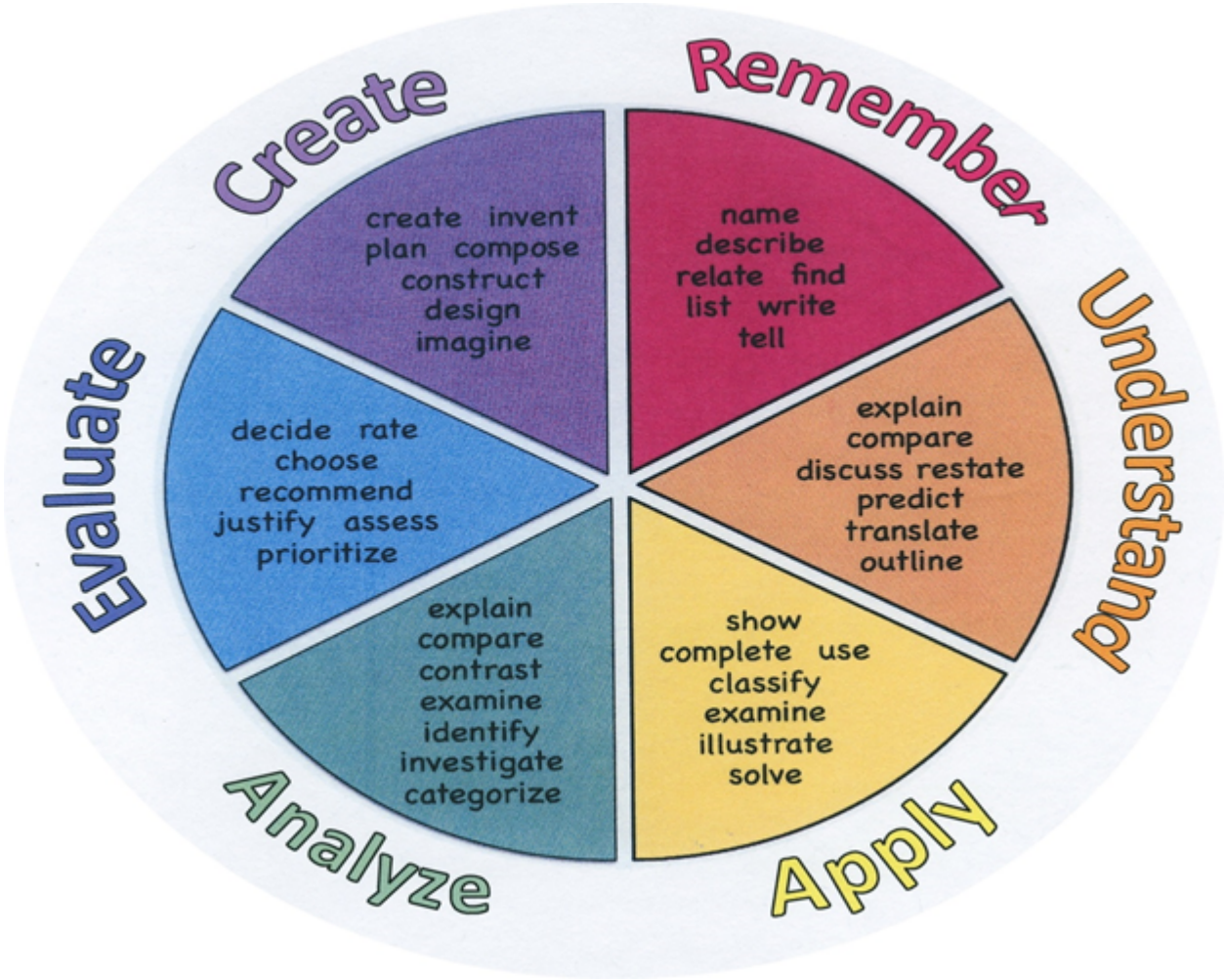
- **Identify** nutrients found in canned food sources via the product's nutrition label
- Use computer dietary analysis to assess a 2-day dietary intake including canned foods and **summarize** results
- **Locate** nutrition-related information on the Internet and use **evaluative** criteria to **identify** reliability of the information

Action Verbs

Below are examples of action verbs associated with each level of the Revised Bloom's Taxonomy. These are useful in writing learning objectives, assignment objectives and exam questions.

Remember	Understand	Apply	Analyze	Evaluate	Create
Choose	Classify	Choose	Categorize	Appraise	Combine
Describe	Defend	Dramatize	Classify	Judge	Compose
Define	Demonstrate	Explain	Compare	Criticize	Construct
Label	Distinguish	Generalize	Differentiate	Defend	Design
List	Explain	Judge	Distinguish	Compare	Develop
Locate	Express	Organize	Identify	Assess	Formulate
Match	Extend	Paint	Infer	Conclude	Hypothesize
Memorize	Give Examples	Prepare	Point out	Contrast	Invent
Name	Illustrate	Produce	Select	Critique	Make
Omit	Indicate	Select	Subdivide	Determine	Originate
Recite	Interrelate	Show	Survey	Grade	Organize
Select	Interpret	Sketch	Arrange	Justify	Plan
State	Infer	Solve	Breakdown	Measure	Produce
Count	Match	Use	Combine	Rank	Role Play
Draw	Paraphrase	Add	Detect	Rate	Drive
Outline	Represent	Calculate	Diagram	Support	Devise

Point Quote Recall Recognize Repeat Reproduce	Restate Rewrite Select Show Summarize Tell Translate Associate Compute Convert Discuss Estimate Extrapolate Generalize Predict	Change Classify Complete Compute Discover Divide Examine Graph Interpolate Manipulate Modify Operate Subtract	Discriminate Illustrate Outline Point out Separate	Test	Generate Integrate Prescribe Propose Reconstruct Revise Rewrite Transform



Interdisciplinary Connections

Please list all and any cross-curricular content standards that link to this Unit.

LA.RST.9-10	Reading Science and Technical Subjects
LA.RST.9-10.1	Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
LA.RST.9-10.2	Determine the central ideas, themes, or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.
LA.RST.9-10.3	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

Alignment to 21st Century Skills & Technology

Key SUBJECTS AND 21st CENTURY THEMES

Mastery of key subjects and 21st century themes is essential for all students in the 21stcentury.

Key subjects include:

- English, reading or language arts
- World languages
- Arts
- Mathematics
- Economics
- Science
- Geography
- History
- Government and Civics

21st Century/Interdisciplinary Themes

- Civic Literacy
- Environmental Literacy
- Financial, Economic, Business and Entrepreneurial Literacy
- Global Awareness
- Health Literacy

21st Century Skills

- Communication and Collaboration
- Creativity and Innovation
- Critical thinking and Problem Solving
- ICT (Information, Communications and Technology) Literacy
- Information Literacy

- Life and Career Skills
- Media Literacy

Technology Infusion

What technology can be used in this unit to enhance learning?

Differentiation

As a Reminder:

The basis of good differentiation in a lesson lies in differentiating by content, process, and/or product.

Resources:

- NJDOE: Instructional Supports and Scaffolds for Success in Implementing the Common Core State Standards http://www.state.nj.us/education/modelcurriculum/success/math/k2/

Special Education

- printed copy of board work/notes provided
- additional time for skill mastery
- assistive technology
- behavior management plan
- Center-Based Instruction
- check work frequently for understanding
- computer or electronic device utilizes
- extended time on tests/ quizzes
- have student repeat directions to check for understanding
- highlighted text visual presentation
- modified assignment format
- modified test content
- modified test format
- modified test length
- multiple test sessions
- multi-sensory presentation
- preferential seating
- preview of content, concepts, and vocabulary
- reduced/shortened reading assignments
- Reduced/shortened written assignments
- secure attention before giving instruction/directions
- shortened assignments
- student working with an assigned partner
- teacher initiated weekly assignment sheet
- Use open book, study guides, test prototypes

ELL

- teaching key aspects of a topic. Eliminate nonessential information
- using videos, illustrations, pictures, and drawings to explain or clarif
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning;
- allowing students to correct errors (looking for understanding)
- allowing the use of note cards or open-book during testing
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using computer word processing spell check and grammar check features
- using true/false, matching, or fill in the blank tests in lieu of essay tests

Intervention Strategies

- allowing students to correct errors (looking for understanding)
- teaching key aspects of a topic. Eliminate nonessential information
- allowing products (projects, timelines, demonstrations, models, drawings, dioramas, poster boards, charts, graphs, slide shows, videos, etc.) to demonstrate student's learning
- allowing students to select from given choices
- allowing the use of note cards or open-book during testing
- collaborating (general education teacher and specialist) to modify vocabulary, omit or modify items to reflect objectives for the student, eliminate sections of the test, and determine how the grade will be determined prior to giving the test.
- decreasing the amount of workpresented or required
- having peers take notes or providing a copy of the teacher's notes
- marking students' correct and acceptable work, not the mistakes
- modifying tests to reflect selected objectives
- providing study guides
- reducing or omitting lengthy outside reading assignments
- reducing the number of answer choices on a multiple choice test
- tutoring by peers
- using authentic assessments with real-life problem-solving
- using true/false, matching, or fill in the blank tests in lieu of essay tests

- using videos, illustrations, pictures, and drawings to explain or clarify

Evidence of Student Learning-CFU's

Please list ways educators may effectively check for understanding in this secion.

- Admit Tickets
- Anticipation Guide
- Common benchmarks
- Compare & Contrast
- Create a Multimedia Poster
- Define
- Describe
- Evaluate
- Evaluation rubrics
- Exit Tickets
- Explaining
- Fist- to-Five or Thumb-Ometer
- Illustration
- Journals
- KWL Chart
- Newspaper Headline
- Outline
- Question Stems
- Quickwrite
- Quizzes
- Red Light, Green Light
- Self- assessments
- Socratic Seminar
- Study Guide
- Teacher Observation Checklist
- Think, Pair, Share
- Think, Write, Pair, Share
- Top 10 List
- Unit tests

Primary Resources

Please list all resources available to you that are located either within the district or that can be obtained by district resources.

- Textbook: *Discovering Food and Nutrition*
- Textbook: *Food, Nutrition & Wellness*
- *Textbook: The Bio-chemistry of Food and Nutrition*
- *Textbook: Teachers Editio*
- *Teacher prepared packets*
- Power Point Presentation
- Lab/Experiments
- Guest speakers
- Research Assignments
- Smart Board
- Internet
- Online Resources Glencoe.com
- Demonstrations
- Unit Project
- Group work
- Chapter worksheets/questions
- student notebook
- Unit test

Ancillary Resources

Please list ALL other resources available to strengthen your lesson.

Do Now: List three micro-organisms found in food.

- Life experience
- Guest Speaker
- Feld Trip
- Current Events
- Media Center

- Food Magazines
- Scientific journals
- Medical Journal
- Youtube training video

Sample Lesson

One Lesson per Curriculum must bein this lesson plan template. I.e. one lesson in one unit

Unit Name:

NJSLS:

Interdisciplinary Connection:

Statement of Objective:

Anticipatory Set/Do Now:

Learning Activity:

Student Assessment/CFU's:

Materials:

21st Century Themes and Skills:

Differentiation/Modifications:

Integration of Technology: