Unit 5 The Chemistry of Food

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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 5 The Chemistry of Food SWDAT identify enzymes, leavening agents, biochemistry of milk and food additives.

- Explain the functions of enzymes as catalysts in chemical reactions.
- Compare the functions and activities of enzymes and coenzymes.
- Explain how enzymes are used in digestions.
- Explain how enzyme reactions are involved in food preperation.
- What effects enzyme activitie.
- Identify the purpose of leavening agents.
- Explain natural leavening agentsand how they work.
- Explain chemical process by which baking powder and baking soda leaven baked goods.
- Describe the role of yeast in leavening.
- Difference between quick breads and other breads
- Compare different leavening agents used in differrent types of cakes.
- Evaluate the nutritional value of specific wheat products.
- Identify how milk is processed and the effects of pasteurizing,homogenizing,and fortifying milk.
- Distinguish the charateristics of milk.
- Explain what happens when milk protein is coagulated.
- Identify common food additives and their uses.
- Compare naural and synthetic additives in milk.
- Identify general and specific uses of preservatives.
- Compare methods for adding nutrients to food.

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NJSLS

9.3.12.AG	Agriculture, Food & Natural Resources
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.4	Evaluate how traditional and nontraditional careers have evolved regionally, nationally, and globally.
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

By the end of this unit SWDAT to identify and evaluate the following:

- Explain the functions of enzymes as catalysts in chemical reactions.
- Compare the functions and activities of enzymes and coenzymes.
- Explain how enzymes are used in digestions.
- Explain how enzyme reactions are involved in food preperation.
- What effects enzyme activitie.
- Identify the purpose of leavening agents.
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- Identify common food additives and their uses.
- Compare naural and synthetic additives in milk.
- Identify general and specific uses of preservatives.

- Compare methods for adding nutrients to food.

Enduring Understanding

AT the end of Unit 5 The chemistry of food SWDAT to identify and evaluate the following:

- Explain the functions of enzymes as catalysts in chemical reactions.
- Compare the functions and activities of enzymes and coenzymes.
- Explain how enzymes are used in digestions.
- Explain how enzyme reactions are involved in food preperation.
- What effects enzyme activitie.
- Identify the purpose of leavening agents.
- Explain natural leavening agentsand how they work.
- Explain chemical process by which baking powder and baking soda leaven baked goods.
- Describe the role of yeast in leavening.
- Difference between quick breads and other breads
- Compare different leavening agents used in differrent types of cakes.
- Evaluate the nutritional value of specific wheat products.
- Identify how milk is processed and the effects of pasteurizing,homogenizing,and fortifying milk.
- Distinguish the charateristics of milk.
- Explain what happens when milk protein is coagulated.
- Identify common food additives and their uses.
- Compare naural and synthetic additives in milk.
- Identify general and specific uses of preservatives.
- Compare methods for adding nutrients to food.

Essential Questions

Essential Question: A question that lies at the heart of a subject or a curriculum and one that promotes inquiry and the discovery of a subject.

- What is a enzymes and how does it become a catalysts in chemical reactions.
- What is the functions of an enzymes and coenzymes?
- How are enzymes used in digestions?
- How do enzymes react in food preperation?

- What effects enzyme activitie?
- What is the purpose of leavening agents?
- What is a natuarl leavening agents and how do they work?
- What happens when you use baking powder and baking soda as leavening agents in baked goods?
- How is the role of yeast different the other leavening agents?
- What is the difference between quick breads and other breads?
- Why do we use different leavening agents in differrent types of cakes?
- How is milk processed and what effects of pasteurization process?
- What are the charateristics of milk?
- What happens when milk protein is coagulated?
- What is a food additives?
- What is the reason we add additives to food?

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:

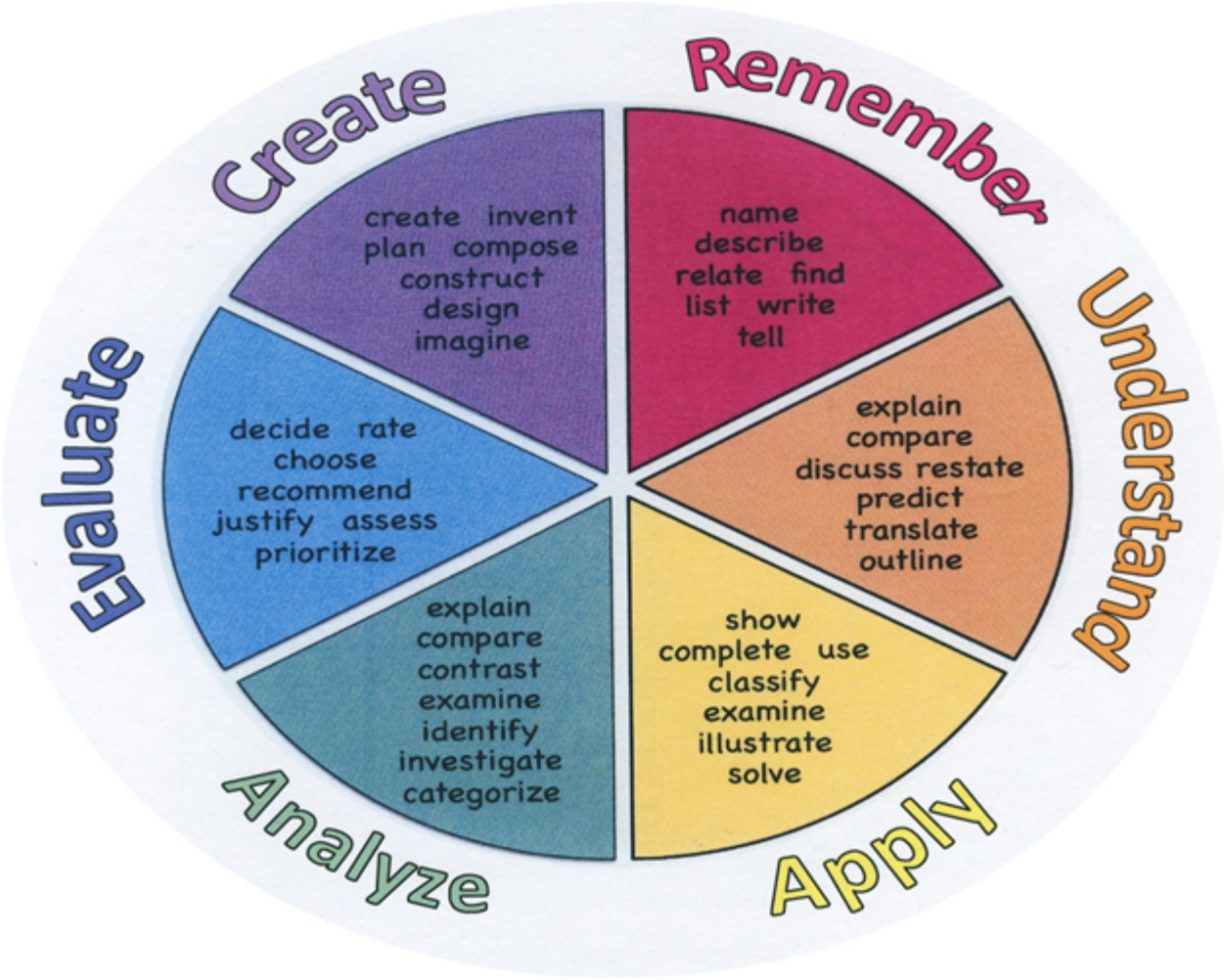
- **Identify** fo found od additives found in common food sources via the product's nutrition label
- Use computer to identify one food from each food group, dietary analysis ,nutrition information and **summarize** results
- **Locate** nutrition-related information on the Internet and use **evaluative** 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	Restate	Change	Discriminate	Test	Generate
Quote	Rewrite	Classify	Illustrate		Integrate
Recall	Select	Complete	Outline		Prescribe
Recognize	Show	Compute	Point out		Propose
Repeat	Summarize	Discover	Separate		Reconstruct
Reproduce	Tell	Divide			Revise
	Translate	Examine			Rewrite
	Associate	Graph			Transform
	Compute	Interpolate			
	Convert	Manipulate			
	Discuss	Modify			
	Estimate	Operate			
	Extrapolate	Subtract			
	Generalize				
	Predict				



Interdisciplinary Connections

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

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
- multi-sensory presentation
- multiple test sessions
- 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 reasons why food processors add additives to their 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: