Unit 3 Chemistry Fundamentals

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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

Unit 3 Chemistry fundamentals student will learn :

- The difference between chemical and physical properties.
- Students will be able to compare chemical reactions to physical changes.
- Relate water composition and structure to its properties.
- Identify qualities of acids and bases
- Compare general qualities of acids and bases in foods
- Explain what affects rates of chemical reaction in food
- Analyze the relationship between food intake and body weight.

NJSLS

9.3.12.AG.1	Analyze how issues, trends, technologies and public policies impact systems in the Agriculture, Food & Natural Resources Career Cluster.
9.3.12.AG.2	Evaluate the nature and scope of the Agriculture, Food & Natural Resources Career Cluster and the role of agriculture, food and natural resources (AFNR) in society and the economy.
9.3.12.AG.3	Examine and summarize the importance of health, safety and environmental management systems in AFNR businesses.
9.3.12.AG-FD.1	Develop and implement procedures to ensure safety, sanitation and quality in food product and processing facilities.
9.3.12.AG-FD.2	Apply principles of nutrition, biology, microbiology, chemistry and human behavior to the

	development of food products.
9.3.12.AG-FD.3	Select and process food products for storage, distribution and consumption.
9.3.12.AG-FD.4	Explain the scope of the food industry and the historical and current developments of food products and processing.

Exit Skills

By the end of Unit 3 Chemistry Fundamentals SWDAT:

- Explain the difference between physical and chemical properties.
- Differentiate between elements,compounds and mixtures.
- Discuss chemical reaction vs. physical changes, and give examples of each.
- Distinguish between pure substances and mixtures.
- Compare heterogeneous and homogeneous mixtures
- Relate water composition and structure to its properties.
- Explain the functions of heat of fusion and heat of vaporization.
- Explain the functions of water n food preperation
- Identify how the human body uses water.
- Identify qualities of acids and bases in relationship to foods and food preperation.
- Identify a calorie as a unit of the energy contained in food
- Explain the concept of "calories in vs. calories out" and how this relates to maintaining a healthy weight
- Explain what affects rates of chemical reaction in food.

Enduring Understanding

Enduring Understanding:

1. Food is essential for maintaining the physical and psychological needs of the human body.
2. In science almost everything is categorized as matter.
3. Physical & chemical Properties of matter
4. Definition of an element, pure substances,compounds and mixtures the role they play with food.
5. Function of water in food preration.
6. Why the body needs water to survive
7. Strength of acids and bases .
8. The relationship between food intake and body weight
9. Identify a calorie as a unit of the energy contained in food
10. Explain the concept of "calories in vs. calories out" and how this relates to maintaining a healthy weight
11. Explain what affects rates of chemical reaction in food

Essential Questions

Essential Question: Unit 3 Chemistry Fundamentals

1. **What is a physical property ?**
2. **What is a chemical property?**
3. **What is a pure substances?**
4. **Why do some liquids not mix?**
5. **What are the differences between elements, compounds and mixtures?**
6. **Name 4 functions of water?**
7. **How many calorie due you need to consume ine pound?**

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 Food Science course SWDAT:

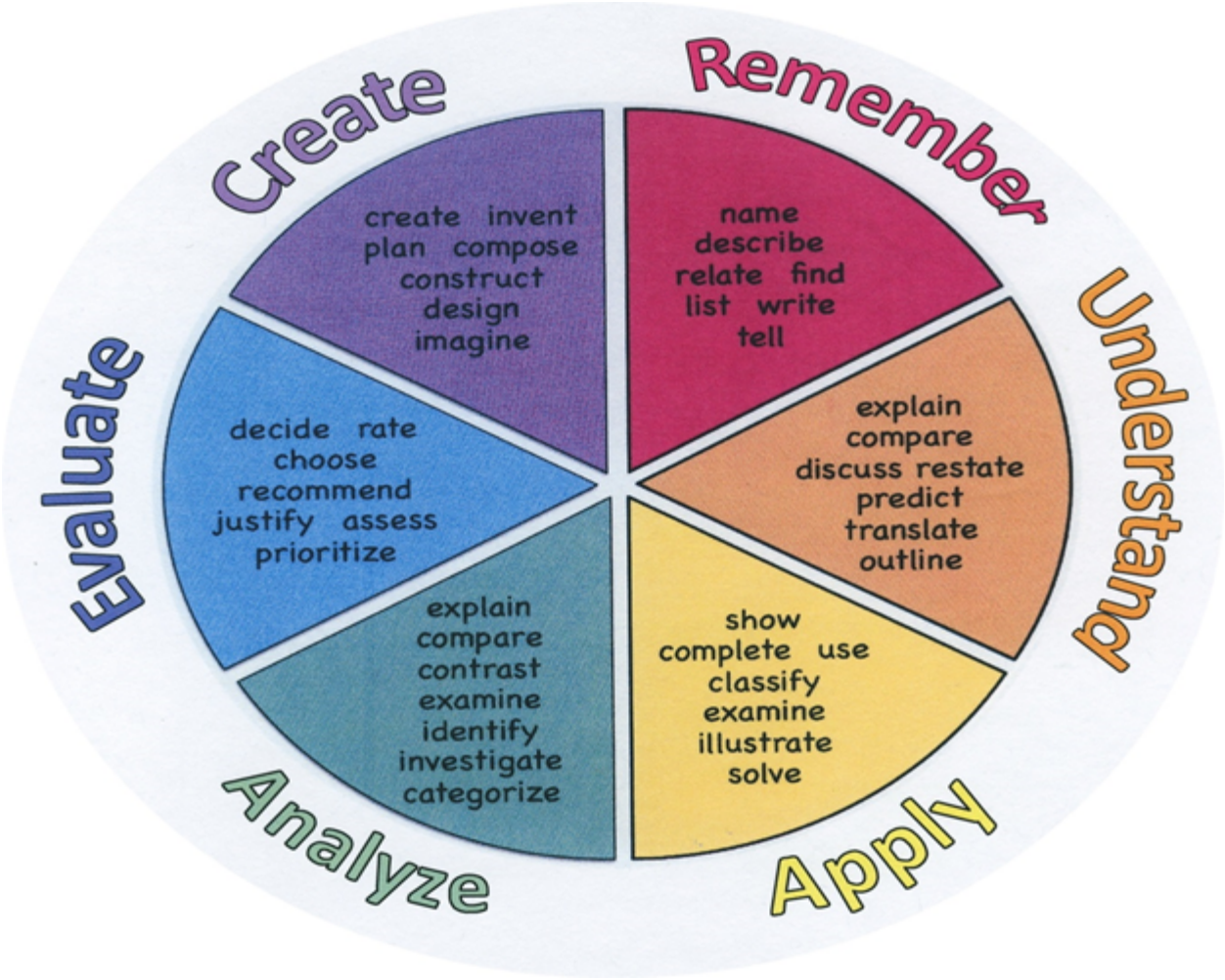
- **Identify** chemical compounds in food
- Use computer and develope a graphic organizer identifing heterogenous and homogenous mixtures and **summarize** results
- **Locate** nutrition-related information on the Internet and use **evaluative** criteria to **identify** reliability of the information

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.

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- 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: What taste buds are on the tongue?

- 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: