Auburn School District	
Food Science and Nutrition	
	Total Framework Hours up to: 180
CIP Code: 190504 ☒**Exploratory** ☐**Preparatory**	**Date Last Modified: January 30, 2013**
Career Cluster: Science Technology Engineering Math	**Career Pathway: Health and Medical Services**

Power Standards

PS 1: Discuss the meaning of food science, its history, and its impact on modern living.
PS 2: Investigate careers within food science, food production and technology, and nutrition.
PS 3: Analyze, implement, and evaluate current county and/or state food safety and sanitation practices.
PS 4: Demonstrate science principles and safety procedures within the food science kitchens and laboratories.
PS 5: Relate biology and chemistry fundamentals to the study and practice of food science.
PS 6: Discuss, analyze, and demonstrate the scientific principles of nutrition (digestion, metabolism, and the six basic nutrients).
PS 7: Analyze, demonstrate, and evaluate the chemical reactions that occur in food science experiments.
PS 8: Discuss, analyze, and evaluate food science, and food production and technology and its impact on individual health, society, and the environment.

Unit Outline

	Hours
Unit 1: Introduction to Food Science	10
Unit 2: Careers in Food Science	10
Unit 3: Food Safety and Sanitation	20
Unit 4: The Food Science Lab	20
Unit 5: Science Fundamentals	20
Unit 6: The Science of Nutrition	50
Unit 7: The Chemistry of Food	30
Unit 8: Food Production and Technology	20
Total Hours	**180**

UNIT 1 The World of Food Science

Performance Assessments:

Research and write a report on food science including all of the contributors to food science

Embedded Leadership Activities

21st Century Skills:
1.A.1 Use a wide range of idea creation techniques (such as brainstorming)
1.B.2 Be open and responsive to new and diverse perspectives; incorporate group input and feedback into the work
1.C.1 Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur
2.B.1 Analyze how parts of a whole interact with each other to produce overall outcomes in complex systems
3.A.2 Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
9.A.1 Know when it is appropriate to listen and when to speak

STANDARDS AND COMPETENCIES

Standard/Unit:

PS 1: Discuss the meaning of food science, its history, and its impact on modern living.
Blooms Taxonomy Level: Comprehension

Competencies	**Total Learning Hours for Unit: 10**
1.1 FCS 9.1.4 Analyze the impact of food science, dietetics, and nutrition occupations on local, state, national, and global economies.	

ALIGNED WASHINGTON STATE STANDARDS	
Art	3.1 Use the arts to express and present ideas and feelings
Communications **COMMON CORE Speaking and Listening Standards**	SL2 Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.
Educational Technology	1.3.2 Locate and organize information from a variety of sources and media.
Writing COMMON CORE Writing Standards for Literacy in History/Social Studies, Science, and Technical Subjects	WHST2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the

	relationships among complex ideas and concepts. d. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). WHST4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. WHST6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
Language Standards COMMON CORE ENGLISH LANGUAGE ARTS & Literacy in History/Social Studies, Science, and Technical subjects,	L4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., analyze, analysis, analytical; advocate, advocacy). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

UNIT 2 Careers in Food Science

Performance Assessments:

Presentations

Embedded Leadership Activities

21st Century Skills:

3.A.5 Communicate effectively in diverse environments (including multi-lingual)
5.B.1 Understand and utilize the most appropriate media creation tools, characteristics and conventions
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
6.A.2 Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy
9.A.1 Know when it is appropriate to listen and when to speak
9.A.2 Conduct themselves in a respectable, professional manner
10.A.2 Prioritize, plan and manage work to achieve the intended result

STANDARDS AND COMPETENCIES

Standard/Unit:

PS 2: Investigate careers within food science, food production and technology, and nutrition.
Blooms Taxonomy Level: Analysis

Competencies	**Total Learning Hours for Unit: 10**

2.1 FCS 9.1.1 Explain the roles and functions of individuals engaged in food science, food technology, dietetics, and nutrition careers.
2.2 FCS 9.1.2 Analyze opportunities for employment and entrepreneurial endeavors.
2.3 FCS 9.1.3 Summarize education and training requirements and opportunities for career paths in food science, food technology, dietetics, and nutrition.
2.4 FCS 9.1.6 Analyze the role of professional organizations in food science, food technology, dietetics, and nutrition careers.

ALIGNED WASHINGTON STATE STANDARDS

Communications **COMMON CORE Speaking and Listening Standards**	SL4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. SL5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. SL6 Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 on page 54 for specific expectations.)
Educational Technology	1.2.1 Communicate and collaborate to learn with others. 1.3.2 Locate and organize information from a variety of sources and media.
Writing COMMON CORE	WHST2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

	c. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). WHST4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. WHST6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
Language Standards COMMON CORE	L4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., analyze, analysis, analytical; advocate, advocacy). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology. d. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

UNIT 3 Food Safety and Sanitation

Performance Assessments:

Presentations
Labs
Reflective Activities
Tests

Embedded Leadership Activities

21st Century Skills:
3.A.5 Communicate effectively in diverse environments (including multi-lingual)
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams
3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
3.B.3 Assume shared responsibility for collaborative work, and value the individual contributions made by each team member
4.A.2 Evaluate information critically and competently
4.B.1 Use information accurately and creatively for the issue or problem at hand
5.B.1 Understand and utilize the most appropriate media creation tools, characteristics and conventions
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
6.A.2 Use digital technologies (computers, PDAs, media players, GPS, etc.), communication/networking tools and social networks appropriately to access, manage, integrate, evaluate and create information to successfully function in a knowledge economy
7.A.1 Adapt to varied roles, jobs responsibilities, schedules and contexts
7.A.2 Work effectively in a climate of ambiguity and changing priorities
8.A.3 Utilize time and manage workload efficiently
8.C.4 Reflect critically on past experiences in order to inform future progress
9.A.1 Know when it is appropriate to listen and when to speak
9.A.2 Conduct themselves in a respectable, professional manner
9.B.1 Respect cultural differences and work effectively with people from a range of social and cultural backgrounds
9.B.2 Respond open-mindedly to different ideas and values
10.A.2 Prioritize, plan and manage work to achieve the intended result
11.B.1 Act responsibly with the interests of the larger community in mind

STANDARDS AND COMPETENCIES

Standard/Unit:

PS 3: Analyze, implement, and evaluate current county and/or state food safety and sanitation practices.
Blooms Taxonomy Level: Analysis, Application, Evaluation

Competencies

Total Learning Hours for Unit: 20

3.1 FCS 9.2.1 Analyze factors that contribute to food borne illness.
3.2 FCS 9.2.2 Analyze food service management safety and sanitation programs.
3.3 FCS 9.2.4 Use the Hazard Analysis Critical Control Point (HACCP) during all food handling processes to minimize the risks of food borne illness.
3.4 FCS 9.2.5 Demonstrate practices and procedures that assure personal and workplace health and hygiene.
3.5 FCS 9.2.6 Demonstrate standard procedures for receiving and storage of raw and prepared foods.
3.6 FCS 9.2.8 Use Occupational Safety and Health Administration's (OSHA) Right to Know Law and Material Safety Data Sheets (MSDS) and explain their requirements in handling hazardous materials.

ALIGNED WASHINGTON STATE STANDARDS	
Art	3.1 Use the arts to express and present ideas and feelings
Communications **COMMON CORE Speaking and Listening Standards**	SL4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. SL5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. SL6 Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 on page 54 for specific expectations.)
Educational Technology	1.2.1 Communicate and collaborate to learn with others. 1.3.2 Locate and organize information from a variety of sources and media.
Health and Fitness	2.1.1 Evaluates dimensions of health and relates to personal health behaviors. 2.3.1 Analyzes personal health practices, and how they affect communicable diseases.
Reading COMMON CORE	RST1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. RST2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. RST3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RST4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. RST7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
Writing COMMON CORE	WHST2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. a. Introduce a topic and organize complex ideas, concepts, and information so that each new element builds on that which precedes it to create a unified whole; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension. b. b. Develop the topic thoroughly by selecting the most significant and relevant facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic. c. c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among complex ideas and concepts. d. d. Use precise language, domain-specific vocabulary and techniques such as metaphor, simile, and analogy to manage the complexity of the topic; convey a knowledgeable stance in a style that responds to the discipline and context as well as to the expertise of likely readers. e. e. Provide a concluding statement or section that follows from and supports the information or explanation provided (e.g., articulating implications or the significance of the topic). WHST4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. WHST6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
Language Standards COMMON CORE	L4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies. a. Use context (e.g., the overall meaning of a sentence, paragraph, or text; a word's position or function in a sentence) as a

	clue to the meaning of a word or phrase. b. Identify and correctly use patterns of word changes that indicate different meanings or parts of speech (e.g., analyze, analysis, analytical; advocate, advocacy). c. Consult general and specialized reference materials (e.g., dictionaries, glossaries, thesauruses), both print and digital, to find the pronunciation of a word or determine or clarify its precise meaning, its part of speech, or its etymology. Verify the preliminary determination of the meaning of a word or phrase (e.g., by checking the inferred meaning in context or in a dictionary).

UNIT 4 The Food Science Lab

Performance Assessments:

Demonstrations
Labs
Reflective Activities
Tests

Embedded Leadership Activities

21st Century Skills:

3.A.2 Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
3.A.5 Communicate effectively in diverse environments (including multi-lingual)
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams
3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
3.B.3 Assume shared responsibility for collaborative work, and value the individual contributions made by each team member
4.A.2 Evaluate information critically and competently
4.B.1 Use information accurately and creatively for the issue or problem at hand
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
7.A.1 Adapt to varied roles, jobs responsibilities, schedules and contexts
7.A.2 Work effectively in a climate of ambiguity and changing priorities
8.A.3 Utilize time and manage workload efficiently
8.B.1 Monitor, define, prioritize and complete tasks without direct oversight
8.C.4 Reflect critically on past experiences in order to inform future progress
9.A.1 Know when it is appropriate to listen and when to speak
9.A.2 Conduct themselves in a respectable, professional manner
9.B.1 Respect cultural differences and work effectively with people from a range of social and cultural backgrounds
9.B.2 Respond open-mindedly to different ideas and values
10.A.2 Prioritize, plan and manage work to achieve the intended result
11.B.1 Act responsibly with the interests of the larger community in mind

STANDARDS AND COMPETENCIES

Standard/Unit:

PS 4: Demonstrate science principles and safety procedures within the food science kitchens and laboratories.
Blooms Taxonomy Level: Application

Competencies	**Total Learning Hours for Unit: 20**

4.1 FCS 9.2.4 Use the Hazard Analysis Critical Control Point (HACCP) during all food handling processes to minimize the risks of food borne illness.
4.2 FCS 9.2.9 Demonstrate waste disposal and recycling methods.FCS 9.3 Evaluate nutrition principles, food plans, preparation techniques and specialized dietary plans.
4.3 FCS 9.3.5 Analyze recipe/formula proportions and modifications for food production.
4.4 FCS 9.5.1 Analyze various factors that affect food preferences in the marketing of food.
4.5 FCS 9.5.4 Maintain test kitchen/ laboratory and related equipment and supplies.
4.6 FCS 9.5.6 Conduct sensory evaluations of food products.

ALIGNED WASHINGTON STATE STANDARDS

Communications **COMMON CORE Speaking and Listening Standards**	SL2 Integrate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, orally) in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data. SL4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. SL6 Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 on page 54 for specific expectations.)
Health and Fitness	2.4.2 Evaluates emergency situations, ways to prevent injuries, and demonstrates skills to respond appropriately and safely.
Reading COMMON CORE	RST1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. RST2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. RST3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RST4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific RST7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem. RST8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information. RST9 Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.
Science	PS3A: Although energy can be transferred from one object to another and can be transformed from one form of energy to another form, the total energy in a closed system remains the same. The concept of conservation of energy, applies to all physical and chemical changes. PS3D: Waves (including sound, seismic, light, and water waves) transfer energy when they interact with matter. Waves can have different wavelengths, frequencies, and amplitudes, and travel at different speeds.
Writing COMMON CORE	WHST2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes. WHST4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. WHST6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
Language Standards COMMON CORE	L4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.

UNIT 5 Science Fundamentals

Performance Assessments:

- Reflective Activities
- Labs
- Quizzes

Embedded Leadership Activities

21st Century Skills:
3.A.2 Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
3.A.5 Communicate effectively in diverse environments (including multi-lingual)
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams
3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
3.B.3 Assume shared responsibility for collaborative work, and value the individual contributions made by each team member
4.B.1 Use information accurately and creatively for the issue or problem at hand
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
7.A.2 Work effectively in a climate of ambiguity and changing priorities
8.A.3 Utilize time and manage workload efficiently
8.B.1 Monitor, define, prioritize and complete tasks without direct oversight
9.A.1 Know when it is appropriate to listen and when to speak

STANDARDS AND COMPETENCIES

Standard/Unit:

PS 5: Relate biology and chemistry fundamentals to the study and practice of food science.
Blooms Taxonomy Level: Comprehension

Competencies	**Total Learning Hours for Unit: 20**
5.1 FCS 9.0 Integrate knowledge, skills, practices required for careers in food science, food technology, dietetics, and nutrition.	

ALIGNED WASHINGTON STATE STANDARDS

Communications **COMMON CORE Speaking and Listening Standards**	SL5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
Reading COMMON CORE	RST1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. RST2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. RST3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RST4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.

	RST7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
Science	SYSA: Feedback is a process in which the output of a system provides information used to regulate the operation of the system. Positive feedback increases the disturbance to a system. Negative feedback reduces the disturbance to a system. SYSB: Systems thinking can be especially useful in analyzing complex situations. To be useful, a system needs to be specified as clearly as possible. SYSD Systems can be changing or in equilibrium. INQB: Scientific progress requires the use of various methods appropriate for answering different kinds of research questions, a thoughtful plan for gathering data needed to answer the question, and care in collecting, analyzing, and displaying the data. INQC: Conclusions must be logical, based on evidence, and consistent with prior established knowledge. PS2A: Atoms are composed of protons, neutrons, and electrons. The nucleus of an atom takes up very little of the atom's volume but makes up almost all of the mass. The nucleus contains protons and neutrons, which are much more massive than the electrons surrounding the nucleus. Protons have a positive charge, electrons are negative in charge, and neutrons have no net charge. PS2B: Atoms of the same element have the same number of protons. The number and arrangement of electrons determines how the atom interacts with other atoms to form molecules and ionic crystals. PS2E: Molecular compounds are composed of two or more elements bonded together in a fixed proportion by sharing electrons between atoms, forming covalent bonds. Such compounds consist of well-defined molecules. Formulas of covalent compounds represent the types and number of atoms of each element in each molecule. PS2F: All forms of life are composed of large molecules that contain carbon. Carbon atoms bond to one another and other elements by sharing electrons, forming covalent bonds. Stable molecules of carbon have four covalent bonds per carbon atom. PS2G: Chemical reactions change the arrangement of atoms in the molecules of substances. Chemical reactions release or acquire energy from their surroundings and result in the formation of new substances. PS2H: Solutions are mixtures in which particles of one substance are evenly distributed through another substance. Liquids are limited in the amount of dissolved solid or gas that they can contain. Aqueous solutions can be described by relative quantities of the dissolved substances and acidity or alkalinity (pH). PS21: The rate of a physical or chemical change may be affected by factors such as temperature, surface area, and pressure. PS2I: The number of neutrons in the nucleus of an atom determines the isotope of the element. Radioactive isotopes are unstable and emit particles and/or radiation. Though the timing of a single nuclear decay is unpredictable, a large group of nuclei decay at a predictable rate, making it possible to estimate the age of materials that contain radioactive isotopes. PS3A: Although energy can be transferred from one object to another and can be transformed from one form of energy to another form, the total energy in a closed system remains the same. The concept of conservation of energy, applies to all physical and chemical changes.
Writing COMMON CORE	WHST4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. WHST9 Draw evidence from informational texts to support analysis, reflection, and research.
Language Standards COMMON CORE	L4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.

UNIT 6 The Science of Nutrition

Performance Assessments:

Presentations
Demonstrations
Experiments

Embedded Leadership Activities

21st Century Skills:
3.A.2 Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
3.A.5 Communicate effectively in diverse environments (including multi-lingual)
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams
3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
3.B.3 Assume shared responsibility for collaborative work, and value the individual contributions made by each team member
4.B.1 Use information accurately and creatively for the issue or problem at hand
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
7.A.1 Adapt to varied roles, jobs responsibilities, schedules and contexts
7.A.2 Work effectively in a climate of ambiguity and changing priorities
8.A.3 Utilize time and manage workload efficiently
8.B.1 Monitor, define, prioritize and complete tasks without direct oversight
8.C.4 Reflect critically on past experiences in order to inform future progress
9.A.1 Know when it is appropriate to listen and when to speak
9.A.2 Conduct themselves in a respectable, professional manner
9.B.1 Respect cultural differences and work effectively with people from a range of social and cultural backgrounds
9.B.2 Respond open-mindedly to different ideas and values
10.A.2 Prioritize, plan and manage work to achieve the intended result
10.B.1 Demonstrate additional attributes associated with producing high quality products including the abilities to:
   a. work positively and ethically
   b. manage time and projects effectively
   c. multi-task
   d. participate actively, as well as be reliable and punctual
   e. present oneself professionally and with proper etiquette
   f. collaborate and cooperate effectively with teams
   g. respect and appreciate team diversity
   h. be accountable for results
11.B.1 Act responsibly with the interests of the larger community in mind

STANDARDS AND COMPETENCIES

Standard/Unit:

PS 6: Discuss, analyze, and demonstrate the scientific principles of nutrition (digestion, metabolism, and the six basic nutrients).
Blooms Taxonomy Level: Comprehension, Analysis, Application

Competencies	**Total Learning Hours for Unit: 50**

6.1 FCS 9.2.4 Use the Hazard Analysis Critical Control Point (HACCP) during all food handling processes to minimize the risks of food borne illness. 6.2 FCS 9.3.2 Analyze nutritional data. 6.3 FCS 9.3.6 Critique the selection of foods to promote a healthy lifestyle. 6.4 FCS 9.3.7 Categorize foods into exchange groups and plan menus, applying the exchange system to meet various nutrient needs. 6.5 FCS 9.4.1 Analyze nutritional needs of individuals. 6.6 FCS 9.4.4 Construct a modified diet based on nutritional needs and health conditions. 6.7 FCS 9.4.5 Design instruction on nutrition for health maintenance and disease prevention

ALIGNED WASHINGTON STATE STANDARDS	
Art	3.1 Use the arts to express and present ideas and feelings
Communications **COMMON CORE Speaking and Listening Standards**	SL5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest. SL6 Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate. (See grades 11–12 Language standards 1 and 3 on page 54 for specific expectations.)
Educational Technology	1.2.1 Communicate and collaborate to learn with others. 1.3.2 Locate and organize information from a variety of sources and media.
Health and Fitness	2.1.1 Evaluates dimensions of health and relates to personal health behaviors.
Reading COMMON CORE	RST1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. RST2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. RST3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RST4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. RST7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
Science	SYSA: Feedback is a process in which the output of a system provides information used to regulate the operation of the system. Positive feedback increases the disturbance to a system. Negative feedback reduces the disturbance to a system. SYSB: Systems thinking can be especially useful in analyzing complex situations. To be useful, a system needs to be specified as clearly as possible. SYSD Systems can be changing or in equilibrium. INQC: Conclusions must be logical, based on evidence, and consistent with prior established knowledge. PS2E: Molecular compounds are composed of two or more elements bonded together in a fixed proportion by sharing electrons between atoms, forming covalent bonds. Such compounds consist of well-defined molecules. Formulas of covalent compounds represent the types and number of atoms of each element in each molecule. PS2F: All forms of life are composed of large molecules that contain carbon. Carbon atoms bond to one another and other elements by sharing electrons, forming covalent bonds. Stable molecules of carbon have four covalent bonds per carbon atom. PS2G: Chemical reactions change the arrangement of atoms in the molecules of substances. Chemical reactions release or acquire energy from their surroundings and result in the formation of new substances. PS2H: Solutions are mixtures in which particles of one substance are evenly distributed through another substance. Liquids are limited in

	the amount of dissolved solid or gas that they can contain. Aqueous solutions can be described by relative quantities of the dissolved substances and acidity or alkalinity (pH). PS21: The rate of a physical or chemical change may be affected by factors such as temperature, surface area, and pressure. PS2I: The number of neutrons in the nucleus of an atom determines the isotope of the element. Radioactive isotopes are unstable and emit particles and/or radiation. Though the timing of a single nuclear decay is unpredictable, a large group of nuclei decay at a predictable rate, making it possible to estimate the age of materials that contain radioactive isotopes. LS1C: Cells contain specialized parts for determining essential functions such as regulation of cellular activities, energy capture and release, formation of proteins, waste disposal, the transfer of information, and movement. LS1D: The cell is surrounded by a membrane that separates the interior of the cell from the outside world and determines which substances may enter and which may leave the cell. LS1F: All of the functions of the cell are based on chemical reactions. Food molecules are broken down to provide the energy and the chemical constituents needed to synthesize other molecules. Breakdown and synthesis are made possible by proteins called enzymes. Some of these enzymes enable the cell to store energy in special chemicals, such as ATP, that are needed to drive the many other chemical reactions in a cell.
Writing COMMON CORE	WHST6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
Language Standards COMMON CORE	L4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.

UNIT 7 The Chemistry of Food

Performance Assessments:

Demonstrations
Labs
Reflective Activities

Embedded Leadership Activities

21st Century Skills:
3.A.2 Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
3.A.5 Communicate effectively in diverse environments (including multi-lingual)
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams
3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
3.B.3 Assume shared responsibility for collaborative work, and value the individual contributions made by each team member
4.B.1 Use information accurately and creatively for the issue or problem at hand
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
7.A.1 Adapt to varied roles, jobs responsibilities, schedules and contexts
7.A.2 Work effectively in a climate of ambiguity and changing priorities
8.A.3 Utilize time and manage workload efficiently
8.B.1 Monitor, define, prioritize and complete tasks without direct oversight
9.A.1 Know when it is appropriate to listen and when to speak
9.A.2 Conduct themselves in a respectable, professional manner
9.B.2 Respond open-mindedly to different ideas and values
10.A.2 Prioritize, plan and manage work to achieve the intended result
10.B.1 Demonstrate additional attributes associated with producing high quality products including the abilities to:
   a. work positively and ethically
   b. manage time and projects effectively
   c. multi-task
   d. participate actively, as well as be reliable and punctual
   e. present oneself professionally and with proper etiquette
   f. collaborate and cooperate effectively with teams
   g. respect and appreciate team diversity
   h. be accountable for results
11.B.1 Act responsibly with the interests of the larger community in mind

STANDARDS AND COMPETENCIES

Standard/Unit:

PS 7: Analyze, demonstrate, and evaluate the chemical reactions that occur in food science experiments.
Blooms Taxonomy Level: Analysis, Application, Evaluation

Competencies	**Total Learning Hours for Unit: 30**

7.1	FCS 9.1.4 Analyze the impact of food science, dietetics, and nutrition occupations on local, state, national, and global economies.
7.2	FCS 9.2.4 Use the Hazard Analysis Critical Control Point (HACCP) during all food handling processes to minimize the risks of food borne illness.
7.3	FCS 9.3.3 Apply principles of food production to maximize nutrient retention in prepared foods.

ALIGNED WASHINGTON STATE STANDARDS	
Art	3.1 Use the arts to express and present ideas and feelings
Reading COMMON CORE	RST1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. RST2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. RST3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RST4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. RST7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
Science	INQC: Conclusions must be logical, based on evidence, and consistent with prior established knowledge. PS2G: Chemical reactions change the arrangement of atoms in the molecules of substances. Chemical reactions release or acquire energy from their surroundings and result in the formation of new substances. PS2H: Solutions are mixtures in which particles of one substance are evenly distributed through another substance. Liquids are limited in the amount of dissolved solid or gas that they can contain. Aqueous solutions can be described by relative quantities of the dissolved substances and acidity or alkalinity (pH). PS21: The rate of a physical or chemical change may be affected by factors such as temperature, surface area, and pressure. PS2I: The number of neutrons in the nucleus of an atom determines the isotope of the element. Radioactive isotopes are unstable and emit particles and/or radiation. Though the timing of a single nuclear decay is unpredictable, a large group of nuclei decay at a predictable rate, making it possible to estimate the age of materials that contain radioactive isotopes.
Writing COMMON CORE	WHST4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
Language Standards COMMON CORE	L4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.

UNIT 8 Food Production and Technology

Performance Assessments:

Labs
Reflective Activities
Presentations

Embedded Leadership Activities

21st Century Skills:
2.C.1 Effectively analyze and evaluate evidence, arguments, claims and beliefs
2.C.2 Analyze and evaluate major alternative points of view
2.C.3 Synthesize and make connections between information and arguments
2.C.4 Interpret information and draw conclusions based on the best analysis
2.D.2 Identify and ask significant questions that clarify various points of view and lead to better solutions
3.A.2 Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
3.A.5 Communicate effectively in diverse environments (including multi-lingual)
3.B.1 Demonstrate ability to work effectively and respectfully with diverse teams
3.B.2 Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
3.B.3 Assume shared responsibility for collaborative work, and value the individual contributions made by each team member
4.A.2 Evaluate information critically and competently
4.B.1 Use information accurately and creatively for the issue or problem at hand
4.B.3 Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information 6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
5.A.1 Understand both how and why media messages are constructed, and for what purposes
5.A.2 Examine how individuals interpret messages differently, how values and points of view are included or excluded, and how media can influence beliefs and behaviors
6.A.1 Use technology as a tool to research, organize, evaluate and communicate information
7.A.1 Adapt to varied roles, jobs responsibilities, schedules and contexts
7.A.2 Work effectively in a climate of ambiguity and changing priorities
7.B.3 Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments 8.A.3 Utilize time and manage workload efficiently
8.B.1 Monitor, define, prioritize and complete tasks without direct oversight
8.C.4 Reflect critically on past experiences in order to inform future progress
9.A.1 Know when it is appropriate to listen and when to speak
9.A.2 Conduct themselves in a respectable, professional manner
9.B.1 Respect cultural differences and work effectively with people from a range of social and cultural backgroun
9.B.2 Respond open-mindedly to different ideas and values
9.B.3 Leverage social and cultural differences to create new ideas and increase both innovation and quality of work
10.A.2 Prioritize, plan and manage work to achieve the intended result
10.B.1 Demonstrate additional attributes associated with producing high quality products including the abilities to:
a. work positively and ethically
b. manage time and projects effectively

c. multi-task
d. participate actively, as well as be reliable and punctual
e. present oneself professionally and with proper etiquette
f. collaborate and cooperate effectively with teams
g. respect and appreciate team diversity
h. be accountable for results

11.B.1 Act responsibly with the interests of the larger community in mind

STANDARDS AND COMPETENCIES

Standard/Unit:

PS 8: Discuss, analyze, and evaluate food science, and food production and technology and its impact on individual health, society, and the environment.
Blooms Taxonomy Level: Comprehension, Analysis, Evaluation

Competencies	**Total Learning Hours for Unit: 8**

8.1 FCS 9.1.6 Analyze the role of professional organizations in food science, food technology, dietetics, and nutrition careers.
8.2 FCS 9.2.4 Use the Hazard Analysis Critical Control Point (HACCP) during all food handling processes to minimize the risks of food borne illness.
8.3 FCS 9.6.1 Build menus to customer/ client preferences.
8.4 FCS 9.6.2 Implement food preparation, production, and testing systems.
8.5 FCS 9.6.3 Apply standards for food quality.
8.6 FCS 9.6.4 Create standardized recipes.
8.7 FCS 9.6.5 Manage amounts of food to meet needs of customers, clients.
8.8 FCS 9.6.6 Analyze new products.
8.9 FCS 14.5.1 Analyze how scientific and technical advances influence the nutrient content, availability, and safety of foods.
8.10 FCS 14.5.2 Analyze how the scientific and technical advances in food processing, storage, product development, and distribution influence nutrition and wellness.
8.11 FCS 14.5.3 Analyze the effects of technological advances on selection, preparation and home storage of food.
8.12 FCS 14.5.4 Analyze the effects of food science and technology on meeting nutritional needs.

ALIGNED WASHINGTON STATE STANDARDS

Communications **COMMON CORE Speaking and Listening Standards**	SL1 Initiate and participate effectively in a range of collaborative discussions (one-on- one, in groups, and teacher-led) with diverse partners on *grades 11–12 topics, texts, and issues,* building on others' ideas and expressing their own clearly and persuasively. a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas. b. Work with peers to promote civil, democratic discussions and decision making, set clear goals and deadlines, and establish individual roles as needed. c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task. SL4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks. SL6 Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.

Educational Technology	1.2.1 Communicate and collaborate to learn with others. 1.3.2 Locate and organize information from a variety of sources and media. 1.3.4 Use multiple processes and diverse perspectives to explore alternative solutions.
Reading COMMON CORE	RST1 Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. RST2 Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. RST3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text. RST4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics. RST7 Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
Science	LS2F: The concept of sustainable development supports adoption of policies that enable people to obtain the resources they need today without limiting the ability of future generations to meet their own needs. Sustainable processes include substituting renewable for nonrenewable resources, recycling, and using fewer resources.
Social Studies	2.4.1 Analyzes and evaluates how people across the world have addressed issues involved with the distribution of resources and sustainability in the past or present. (9/10)
Writing COMMON CORE	WHST1 Write arguments focused on *discipline-specific content.* WHST4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. WHST6 Use technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information. WHST9 Draw evidence from informational texts to support analysis, reflection, and research. WHST10 Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
Language Standards COMMON CORE	L4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 9–10 reading and content, choosing flexibly from a range of strategies.

21st CENTURY SKILLS		
Check those that students will demonstrate in this standard/unit:		
LEARNING AND INNOVATION **Creativity and Innovation** ☒Think Creatively ☒Work Creatively with Others ☒Implement Innovations **Critical Thinking and Problem Solving** ☒Reason Effectively ☒**U**se Systems Thinking ☒Make Judgments and Decisions ☒Solve Problems **Communication and Collaboration** ☒Communicate Clearly ☒Collaborate with Others	**INFORMATION, MEDIA AND TECHNOLOGY SKILLS** **Information Literacy** ☒Access and /evaluate Information ☒Use and Manage Information **Media Literacy** ☒Analyze Media ☒Create Media Products **Information, Communications and Technology (ICT Literacy)** ☒Apply Technology Effectively	**LIFE AND CAREER SKILLS** **Flexibility and Adaptability** ☒Adapt to Change ☒Be Flexible **Initiative and Self-Direction** ☒Manage Goals and Time ☒Work Independently ☒Be Self-Directed Learners **Social and Cross-Cultural** ☒Interact Effectively with Others ☒Work Effectively in Diverse Teams **Productivity and Accountability** ☒Manage Projects ☒Produce Results **Leadership and Responsibility** ☒Guide and Lead Others ☒Be Responsible to Others