

Auburn Framework: AP Environmental Science

Course: Natural Resources/Conservation, General

Total Framework Hours: 180 Hours

CIP Code: 030101

Type: Exploratory

Career Cluster: Agriculture, Food and Natural Resources

Date Last Modified: Friday, January 30, 2015

Resources and Standard used in Framework Development:

Standards for this framework are taken from the OSPI Model Framework for Natural Resource Systems

Unit 1 SAE

Hours: 10

Performance Assessment(s):

Students present their SAE Project

Groups will research and present on each of the six major themes of Environmental Science

Students will team teach and assess the themes to other groups

Student brainstormed a concept map of environmental science and present to class

Students compare concept maps to university environmental science programs to show broadness of the career path.

This course will include instruction in and Student involvement in Supervised Agriculture Experience Projects (SAE). The Student will demonstrate competence in the application of scientific principles and techniques to the management of natural resources.

Leadership Alignment:

Sustainability Themes Project: Students will demonstrate the ability to work creatively with others, reason effectively and communicate clearly through the research, completion, and presentation of the sustainability themes project

Leadership activity embedded in curriculum and instruction. (Examples: CTSO project or activity, Life Knowledge/Cluster Skills locally developed leadership project or activity, embedded 21st Century interdisciplinary theme activity such as global awareness, financial, economic, business & entrepreneurial literacy, civic literacy, health & safety, environmental literacy)

FFA Leadership Ex.

Forestry Natural resource CDE

Ecology, soils management SAE

Standards and Competencies

SAE.01.01: Students will establish and conduct Supervised Agriculture Experience Projects (SAE).

SAE.01.01.c.Explain the connection between SAE and FFA.

NRS.02.03: Measure and survey natural resource status to obtain planning data.

Level 1

NRS.02.03.01.b. Discuss the procedures for conducting resource inventories and population studies.

CS.01.01: Action: Exhibit the skills and competencies needed to achieve a desired result.

Level 1

CS.01.01.04.b. Use appropriate and reliable resources to complete an action or project.

Level 3

CS.01.01.01.c. Work independently and in group settings to accomplish a task.

CS.01.05: Awareness: Desire purposeful understanding related to professional and personal activities

Level 3

CS.01.05.01.c. Articulate current issues that are important to the local, state, national and global communities.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Presentation of Knowledge and Ideas

4 - Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

5 - Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Vocabulary Acquisition and Use

6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Mathematics

CC: Statistics and Probability (S)

Interpreting Categorical and Quantitative Data (S-ID)

5 - Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.*

Reading

CC: Reading Informational Text

Integration of Knowledge and Ideas (11-12)

7 - Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a question or solve a problem.

CC: College and Career Readiness Anchor Standards for Reading

Craft and Structure

4 - Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Science

Social Studies

Writing

CC: Writing for Literacy in History/Social Studies, Science, and Technical Subjects (9-10)

Production and Distribution of Writing

6 - Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

CC: College and Career Readiness Anchor Standards for Writing

Production and Distribution of Writing

4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

6 - Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

7 - Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Other
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboratio

- 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

- Mange Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Other
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 2 ENVIRONMENTAL SCIENCE**Hours: 10****Performance Assessment(s):**

Groups will research and do a presentation on each of the six major themes of environmental science. The groups will teach and assess these themes to the other students. Students brainstorm concept maps of environmental science and present those to the class. The concept maps are then compared to university environmental science programs and comparisons are made to show broadness of the career path.

Leadership Alignment:

Sustainability Themes Projects: Students will demonstrate the ability to work creatively with others, reason effectively, and communicate clearly through the research, completion, and presentation of the sustainability themes project.

Standards and Competencies

CS.01.01: Action: Exhibit the skills and competencies needed to achieve a desired result.

Level 3

CS.01.01.01.c. Work independently and in group settings to accomplish a task.

CS.01.01.04.c. Create resources to complete an action or project.

CS.01.02: Relationships: Build a constituency through listening, coaching, understanding and appreciating others.

Level 3

CS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.

CS.01.04: Character: Conduct professional and personal activities based on virtues.

Level 3

CS.01.04.02.c. Assess personal values.

Aligned to Washington State Standards**Arts**

Arts 2.0 The student demonstrates thinking skills using artistic processes.

2.1. Applies a creative process to the arts (dance, music, theatre and visual arts):

Arts 3.0 The student communicates through the arts.

3.2 Uses the arts to communicate for a specific purpose.

Communication - Speaking and Listening

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

2 - Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

Health and Fitness

Health 3.1: Understands how family, culture, and environmental factors affect personal health.

3.1.1 Analyzes how family and cultural diversity enriches and affects personal health behaviors.

Language

CC: College and Career Readiness Anchor Standards for Language

Vocabulary Acquisition and Use

4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Mathematics

Reading

CC: College and Career Readiness Anchor Standards for Reading

Key Ideas and Details

1 - Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

Craft and Structure

4 - Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

Integration of Knowledge and Ideas

10 - Read and comprehend complex literary and informational texts independently and proficiently.

Science

Life Sciences

HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

HS-LS4 Biological Evolution: Unity and Diversity

HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

Social Studies

Geography

3.1.2 (9-10) Identifies major world regions and understands their cultural roots.

3.1.2 (11) Analyzes how differences in regions and spatial patterns have emerged in the United States from natural processes and human activities.

Geography 3.2: Understands human interaction with the environment.

3.2.1 (9-10) Analyzes and evaluates human interaction with the environment across the world in the past or present.

Writing

CC: Writing for Literacy in History/Social Studies, Science, and Technical Subjects (9-10)

6 - Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology's capacity to link to other information and to display information flexibly and dynamically.

CC: College and Career Readiness Anchor Standards for Writing

Text Types and Purposes

1 - Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Production and Distribution of Writing

4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Research to Build and Present Knowledge

8 - Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Other
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboratio

- 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

- Mange Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Other
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 3 ECOLOGY**Hours: 60****Performance Assessment(s):**

Apply scientific principles to natural resource management activities.

Students will explore the biodiversity of an island, evolution of the island, and use different presentation techniques (journals, drawings, etc.) to document the scientific discoveries.

Students look at the impact of building on local watershed (runoff, contamination, etc.) using mapping and other skills.

Leadership Alignment:

Leadership activity embedded in curriculum and instruction. (Examples: CTSO project or activity, Life Knowledge/Cluster Skills, locally developed leadership project or activity, embedded 21st Century interdisciplinary theme activity such as global awareness, financial, economic, business & entrepreneurial literacy, civic literacy, health & safety, environmental literacy)

Island Biogeography Project: Through this project students will be assessed on the following 21st Century Skills: Their ability to be self-directed learners in the completion of their island biogeography and role research project and presentation. Students were also assessed on the following skills through the completion of this project: Collaboration with others, and creative thinking, Evaluate information critically, using and managing information, and applying technology.

Biomes Project: Create a tri-fold brochure about a specific Biome

Standards and Competencies

NRS.01.02: Classify natural resources

NRS.01.02.04.b Identify aquatic species

Level 3

NRS.01.02.02.c. Conduct a field inventory of herbaceous plants, and record and document findings.

CS.01.01: Action: Exhibit the skills and competencies needed to achieve a desired result.

Level 3

CS.01.01.04.c. Create resources to complete an action or project.

Aligned to Washington State Standards**Arts**

Arts 2.0 The student demonstrates thinking skills using artistic processes.

2.1. Applies a creative process to the arts (dance, music, theatre and visual arts):

Arts 3.0 The student communicates through the arts.

3.2 Uses the arts to communicate for a specific purpose.

Communication - Speaking and Listening

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Comprehension and Collaboration

1 - Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

2 - Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

Presentation of Knowledge and Ideas

4 - Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Vocabulary Acquisition and Use

- 4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.
- 5 - Demonstrate understanding of word relationships and nuances in word meanings.
- 6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Mathematics

CC: Mathematical Practices (MP)

- 1 - Make sense of problems and persevere in solving them.

CC: Statistics and Probability (S)

Making Inferences and Justifying Conclusions (S-IC)

- 4 - Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.*
- 6 - Evaluate reports based on data.*

Reading

CC: College and Career Readiness Anchor Standards for Reading

Key Ideas and Details

- 1 - Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
- 2 - Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Integration of Knowledge and Ideas

- 7 - Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.
- 9 - Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Science

Earth and Space Sciences

HS-ESS3 Earth and Human Activity

- HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
- HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
- HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.*
- HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

Life Sciences

HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

- HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS3 Heredity: Inheritance and Variation of Traits

HS-LS3-1. Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS-LS3-2. Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

Social Studies

Geography

Geography 3.1: Understands the physical characteristics, cultural characteristics, and location of places, regions, and spatial patterns on the Earth's surface.

3.1.1 (11-12) Analyzes information from geographic tools, including computer-based mapping systems, to draw conclusions on an issue or event.

Geography 3.2: Understands human interaction with the environment.

3.2.1 (9-10) Analyzes and evaluates human interaction with the environment across the world in the past or present.

Civics

Civics 1.2: Understands the purposes, organization, and function of governments, laws, and political systems.

1.2.3 (12) Analyzes and evaluates the structures of state, tribal, and federal forms of governments by comparing them to those of other governments.

History

History 4.4: Uses history to understand the present and plan for the future.

4.4.1 (9-10) Analyzes how an understanding of world history can help us prevent problems today.

Writing

CC: College and Career Readiness Anchor Standards for Writing

Text Types and Purposes

2 - Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Production and Distribution of Writing

4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Research to Build and Present Knowledge

7 - Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Other
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboratio

- 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

- Mange Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Other
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 4 BIOSPHERE SCINECE**Hours: 10****Performance Assessment(s):**

Students work in groups and independently to create a presentation around each of the biochemical cycles.

Leadership Alignment:

Biogeochemical Cycles

Project/Activity: This activity requires students to research the 5 cycles, illustrate and diagram the cycles, and highlight key points, as well as determine the human impacts for each of the 5 cycles. Through this project students will be assessed on the following 21st Century Skills: Time management and the ability to work independently and think creatively.

Standards and Competencies

NRS.01.01: Performance Indicator: Apply knowledge of natural resource components to the management of natural resource systems.

Level 3

NRS.01.01.02.c. Conduct a field study of an ecosystem, and record and document observations of species interactions.

NRS.01.02: Classify natural resources

Level 1

NRS.01.02.05.a Describe techniques used to identify rock, mineral and soil types

Level 2

NRS.01.02.05.b Identify rock, mineral and soil types.

NRS.02.05: Interpret laws related to natural resource management and protection

Level 1

NRS.02.05.01.a Identify Laws associated natural resource systems

NRS.02.05.01.b. Identify the purposes of laws associated with natural resource systems.

Level 3

NRS.02.05.01.c. Abide by specific laws pertaining to natural resource systems.

NRS.03.01 (Level 3): Produce, harvest, process and use natural resource products.

NRS.03.01.01.c. Harvest forest products according to principles of sustainable forest management.

Aligned to Washington State Standards**Arts**

Arts 2.0 The student demonstrates thinking skills using artistic processes.

2.1. Applies a creative process to the arts (dance, music, theatre and visual arts):

Arts 3.0 The student communicates through the arts.

3.2 Uses the arts to communicate for a specific purpose.

Communication - Speaking and Listening

CC: College and Career Readiness Anchor Standards for Speaking and Listening

Presentation of Knowledge and Ideas

4 - Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

5 - Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Vocabulary Acquisition and Use

6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Mathematics

CC: Statistics and Probability (S)

Making Inferences and Justifying Conclusions (S-IC)

4 - Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.*

5 - Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.*

6 - Evaluate reports based on data.*

CC: Statistics and Probability (S)

Using Probability to Make Decisions (S-MD)

2 (+) - Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.*

Reading

CC: College and Career Readiness Anchor Standards for Reading

Key Ideas and Details

1 - Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

2 - Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Integration of Knowledge and Ideas

7 - Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

9 - Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10 - Read and comprehend complex literary and informational texts independently and proficiently.

Science

Science and Engineering Practices

1. Asking questions and defining problems

Earth and Space Sciences

HS-ESS2 Earth's Systems

HS-ESS2-2. Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth's systems.

Life Sciences

HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

Social Studies

Writing

CC: College and Career Readiness Anchor Standards for Writing

Text Types and Purposes

2 - Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Production and Distribution of Writing

4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

6 - Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Research to Build and Present Knowledge

9 - Draw evidence from literary or informational texts to support analysis, reflection, and research.

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Other
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboratio

- 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

- Mange Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Other
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 5 RESOURCE USE AND MANAGEMENT**Hours: 30****Performance Assessment(s):**

Performance Assessments:

Students will complete a survey of invasive species on site and enter data through the nature mapping database.
Students will complete air quality assessment and testing within each of their private homes and provide data back to the class.

Leadership Alignment:

Endangered Species Project: Students will research and write a professional looking (newspaper or magazine) article aimed at increasing the knowledge of Endangered Species laws and policy, both internationally and nationally; with specific focus on the impacts and current situation for one animal from the endangered species list.
Through this project students will be assessed on the following 21st Century Skills:
Communicate clearly, accessing information, think Creatively and ability to manage projects.
FFA groups CTSO events

Standards and Competencies

NRS.02.05: Interpret laws related to natural resource management and protection

Level 1

NRS.02.05.01.a Identify Laws associated natural resource systems

NRS.02.05.02.a Define Mitigation

Level 2

NRS.02.05.01.b. Identify the purposes of laws associated with natural resource systems.

NRS.02.05.02.b. Identify issues involving mitigation of natural resources.

Level 3

NRS.02.05.01.c. Abide by specific laws pertaining to natural resource systems.

NRS.02.05.02.c. Demonstrate mitigation techniques for natural resources.

NRS.02.06 (Level 1): Apply ecological concepts and principles to natural resource systems.

NRS.02.06.09.a Describe climatic factors that influence natural resources

NRS.02.06 (Level 2): Apply ecological concepts and principles to natural resource systems.

NRS.02.06.01.b. Diagram biogeochemical cycles and explain the processes.

NRS.02.06.05.b. Give examples of primary succession and secondary succession species in a community of organisms.

NRS.03.01 (Level 3): Produce, harvest, process and use natural resource products.

NRS.03.01.05.c. Give examples of methods used to extract and process minerals and ores.

NRS.03.01.06.c. Give examples of methods used to extract and process fossil fuels.

CS.01.01: Action: Exhibit the skills and competencies needed to achieve a desired result.

CS.01.01.04.c. Create resources to complete an action or project.

CS.01.02: Relationships: Build a constituency through listening, coaching, understanding and appreciating others.

CS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.

Aligned to Washington State Standards

Arts

Communication - Speaking and Listening

Health and Fitness

Language

CC: College and Career Readiness Anchor Standards for Language

Vocabulary Acquisition and Use

4 - Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Mathematics

CC: Statistics and Probability (S)

Interpreting Categorical and Quantitative Data (S-ID)

2 - Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.*

Making Inferences and Justifying Conclusions (S-IC)

1 - Understand statistics as a process for making inferences about population parameters based on a random sample from that population.*

Using Probability to Make Decisions (S-MD)

Reading

CC: College and Career Readiness Anchor Standards for Reading

Key Ideas and Details

1 - Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

2 - Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Integration of Knowledge and Ideas

7 - Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

9 - Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10 - Read and comprehend complex literary and informational texts independently and proficiently.

Science

Physical Sciences

HS-PS3 Energy

HS-PS3-1. Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known.

Earth and Space Sciences

HS-ESS1 Earth's Place in the Universe

HS-ESS2-5. Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.

HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

Life Sciences

HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.

HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

HS-LS2-8. Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce.

Social Studies

Writing

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Other
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboratio

- 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

- Mange Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Other
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 6 ENVIRONMENTAL MANAGEMENT**Hours: 30****Performance Assessment(s):**

Students do testing around automobile exhaust and the pollutants that are discovered. The students do scientific write-ups in their lab journals using this data. Students do an environmental audit (HVAC, composting, lighting, etc.) of the building working with professionals in each domain.

Leadership Alignment:

Eco Column Project: Students will be assessed on initiative and self-direction standards through working in teams to establish and maintain model ecosystems, which involve long term monitoring of species air and water quality. Through this project students will be assessed on the following 21st Century Skills: Communicate clearly, accessing information, think Creatively and ability to manage projects.

Standards and Competencies

CS.01.01: Action: Exhibit the skills and competencies needed to achieve a desired result.

Level 3

CS.01.01.04.c. Create resources to complete an action or project.

CS.01.02: Relationships: Build a constituency through listening, coaching, understanding and appreciating others.

CS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.

Aligned to Washington State Standards**Arts****Communication - Speaking and Listening**

3 - Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence.

4 - Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.

5 - 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.

Health and Fitness

Health 2.3: Understands the concepts of prevention and control of disease.

Health 2.4: Acquires skills to live safely and reduce health risks.

Health 3.1: Understands how family, culture, and environmental factors affect personal health.

Language

CC: College and Career Readiness Anchor Standards for Language

Vocabulary Acquisition and Use

6 - Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Mathematics

CC: Statistics and Probability (S)

Interpreting Categorical and Quantitative Data (S-ID)

5 - Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.*

Making Inferences and Justifying Conclusions (S-IC)

1 - Understand statistics as a process for making inferences about population parameters based on a random sample from that population.*

Using Probability to Make Decisions (S-MD)

2 (+) - Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.*

Reading

CC: College and Career Readiness Anchor Standards for Reading

Key Ideas and Details

1 - Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

2 - Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Integration of Knowledge and Ideas

7 - Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

9 - Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

10 - Read and comprehend complex literary and informational texts independently and proficiently.

Science

Life Sciences

HS-LS3 Heredity: Inheritance and Variation of Traits

HS-LS3-3. Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

HS-LS4 Biological Evolution: Unity and Diversity

HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

Social Studies

History

History 4.1: Understands historical chronology.

- Age of revolutions (1750—1917).

History 4.2: Understands and analyzes causal factors that have shaped major events in history.

4.2.2 (11) Analyzes how cultures and cultural groups have shaped the United States (1890 – present).

4.2.3 (9-10) Analyzes and evaluates how technology and ideas have shaped world history (1450—present)

History 4.4: Uses history to understand the present and plan for the future.

4.4.1 (9-10) Analyzes how an understanding of world history can help us prevent problems today.

Writing

CC: College and Career Readiness Anchor Standards for Writing

Text Types and Purposes

1 - Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Production and Distribution of Writing

4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Research to Build and Present Knowledge

8 - Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

21st Century Skills

LEARNING AND INNOVATION

Creativity and Innovation

- Think Creatively
- Work Creatively with Other
- Implement Innovations

Creative Thinking and Problem Solving

- Reason Effectively
- Use Systems Thinking
- Make Judgements and Decisions
- Solve Problems

Communication and Collaboratio

- 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

- Mange Goals and Time
- Work Independently
- Be Self-Directed Learners

Social and Cross-Cultural

- Interact Effectively with Other
- Work Effectively in Diverse Teams

Productivity and Accountability

- Manage Projects
- Produce Results

Leadership and Responsibility

- Guide and Lead Others
- Be Responsible to Others

Unit 7 HUMAN SOCIETY/ POPULATION**Hours: 30****Performance Assessment(s):**

Students will create pamphlets to target groups based around family planning.
Students will do a lab based upon the growth of human population. This will be done using mold as “the population and different treatments to either slow or speed up growth.
This shows the effects of environmental variables on population growth.

Leadership Alignment:

Carbon Footprint Activity: Students will evaluate home and personal energy use by using the footprint calculator. Students will be assessed on the information literacy standards including proper access and evaluation of information and use and management of information collected.
Through this project students will be assessed on the following 21st Century Skills:
Communicate clearly, accessing information, think Creatively and ability to manage projects.

Standards and Competencies

- CS.01.01: Action: Exhibit the skills and competencies needed to achieve a desired result.
Level 3
CS.01.01.04.c. Create resources to complete an action or project.
- CS.01.02: Relationships: Build a constituency through listening, coaching, understanding and appreciating others.
Level 3
CS.01.02.02.c. Engage others in conversations to respond to an obstacle when completing a task.
- CS.01.04: Character: Conduct professional and personal activities based on virtues.
Level 3
CS.01.04.02.c. Assess personal values.

Aligned to Washington State Standards**Arts**

- Arts 3.0 The student communicates through the arts.
3.1 Uses the arts to express feelings and present ideas.
3.2 Uses the arts to communicate for a specific purpose.

Communication - Speaking and Listening

- 2 - Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.
4 - Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
5 - 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.

Health and Fitness

- Health 3.1: Understands how family, culture, and environmental factors affect personal health.
3.1.1 Analyzes how family and cultural diversity enriches and affects personal health behaviors.

Language

- CC: College and Career Readiness Anchor Standards for Language
Knowledge of Language

3 - Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Mathematics

CC: Statistics and Probability (S)

Interpreting Categorical and Quantitative Data (S-ID)

1 - Represent data with plots on the real number line (dot plots, histograms, and box plots).*

Making Inferences and Justifying Conclusions (S-IC)

6 - Evaluate reports based on data.*

Reading

CC: College and Career Readiness Anchor Standards for Reading

Key Ideas and Details

1 - Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

2 - Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

Integration of Knowledge and Ideas

7 - Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

9 - Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

Range of Reading and Level of Text Complexity

10 - Read and comprehend complex literary and informational texts independently and proficiently.

Science

Life Sciences

HS-LS4 Biological Evolution: Unity and Diversity

HS-LS4-1. Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

HS-LS4-4. Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

Earth and Space Sciences

HS-ESS3 Earth and Human Activity

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-2. Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

Social Studies

Writing

CC: College and Career Readiness Anchor Standards for Writing

Text Types and Purposes

1 - Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

2 - Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Production and Distribution of Writing

4 - Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

5 - Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

Research to Build and Present Knowledge

8 - Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

21st Century Skills

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