# Spokane Public Schools
# Horticulture 1, 2, Advanced 3, Advanced 4

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|---|---|---|
| **Courses: Horticulture 1, 2, Advanced 3, Advanced 4** | | **Total Framework Hours up to: 360 Hours** |
| **CIP Code: 011103** | ☒**Exploratory** ☐**Preparatory** | **Date Last Modified: Thursday, May 01, 2014** |
| **Career Cluster: Agriculture, Food and Natural Resources** | | **Cluster Pathway: Agriculture** |

**Resources and Standard used in Framework Development:**
Standards for this framework are taken from the OSPI Model Framework for Plant Systems

| **Unit 1 SAE** | **Hours: 10** |
|---|---|

**Performance Assessment(s):**

Establish and maintain records for SAE-portfolio or record book

Presentation of SAE projects to groups (ex Master Gardeners)

**Leadership Alignment:**

Demonstrate proper safety practices to prevent injury
Record keeping of planting projects- growth and sale
Self-directed learning
Lifelong learning goals
Goal setting

**Standards and Competencies**

SAE.01.01: Students will establish and conduct Supervised Agriculture Experience Projects (SAE).
SAE.01.01.g. Select and establish an SAE project.

## Aligned to Washington State Standards

**Arts**

**Communication - Speaking and Listening**

**Health and Fitness**

**Language**

**Mathematics**

**Reading**

CC: College and Career Readiness Anchor Standards for Reading

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.

**Science**

**Social Studies**

**Writing**

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.

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

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.

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**
- [x] Think Creatively
- [ ] Work Creatively with Others
- [ ] Implement Innovations

**Creative Thinking and Problem Solving**
- [ ] Reason Effectively
- [ ] Use Systems Thinking
- [x] Make Judgements and Decisions
- [x] Solve Problems

**Communication and Collaboration**
- [x] Communicate Clearly
- [ ] Collaborate with Others

### INFORMATION, MEDIA AND TECHNOLOGY SKILLS

**Information Literacy**
- [x] Access and Evaluate Information
- [ ] Use and Manage Information

**Media Literacy**
- [ ] Analyze Media
- [ ] Create Media Products

**Information, Communications, and Technology (ICT Literacy)**
- [x] Apply Technology Effectively

### LIFE AND CAREER SKILLS

**Flexibility and Adaptability**
- [ ] Adapt to Change
- [ ] Be Flexible

**Initiative and Self-Direction**
- [x] Mange Goals and Time
- [x] Work Independently
- [ ] Be Self-Directed Learners

**Social and Cross-Cultural**
- [ ] Interact Effectively with Others
- [ ] Work Effectively in Diverse Teams

**Productivity and Accountability**
- [x] Manage Projects
- [ ] Produce Results

**Leadership and Responsibility**
- [ ] Guide and Lead Others
- [ ] Be Responsible to Others

| Unit 2 PLANT CLASSIFICATION-ANATOMY AND PHYSIOLOGY | Hours: 50 |
|---|---|

**Performance Assessment(s):**

Unit test
Portfolio of plants students have collected, including notes on propagation, and care
Projects
Leaf collection, examination of leaf form, margins and arrangement
Examination of leaves looking at the stoma and chloroplasts,
Examination of the vascular system of plants
Photosynthesis labs examining the process of photosynthesis and respiration, including balancing the equation for photosynthesis and respiration
Flower dissection
Plant Identification portfolio- from FFA national plant list- recording leaf form, margin, and arrangement
Understanding and implementation of safe practices in floral shop and greenhouse
Recording of learning reflections in horticulture notebook

**Leadership Alignment:**

Student will demonstrate safety practices to prevent injury
Record keeping- recording in notebook of the plant growth, and care
Self-directed learning
Lifelong learning goals
Floriculture Operations CDE

## Standards and Competencies

PS.01.01: Classify agricultural plants according to taxonomy systems

Level 1

PS.01.01.01.a Explain systems used to classify plants

Level 2

PS.01.01.01.b.Compare and contrast the hierarchical classification of agricultural plants

Level 3

PS.01.01.01.c Classify agricultural plants according to the hierarchical classification system, life cycles, plant use and as monocotyledons or dicotyledons.

PS.01.02: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems

Level 1

PS.01.02.01.a Diagram a typical plant cell and identify plant cell organelles and their functions

PS.01.02.02.a Identify the components, the types and the functions of plant roots

PS.01.02.03.a Identify the components and the functions of plant stems PS.01.02.04.a.Discuss

Leaf morphology and the functions of leaves

PS.01.02.05.a Identify the components of a flower, the functions of a flower and the functions of flower components

Level 2

PS.01.02.02.b Identify root tissues and explain the pathway of water and nutrients into and through the root tissue

PS.01.02.03.b Describe the processes of translocation

PS.01.02.04.b.Explain how leaves capture light energy and allow for the exchange of gasses

Level 3

PS.01.02.02.c.Relate the active and passive transport of minerals into and through the root system to plant nutrition.

PS.01.02.03.c.Apply concepts associated with translocation to the management of plants.

PS.01.02.04.c Explain the relationship between leaf structure and functions and plant management practices

PS.01.02.05.c Apply the knowledge of flower structure to plant breeding, production and use.

CS.02.03: Professional Growth: Develop awareness and apply skills necessary for achieving career success.

Level 1

CS.02.03.01.a. Explore various career interests/options.

Level 2

CS.02.03.03.b. Develop skills required for a specific career.

Level 3

CS.02.03.03.c. Demonstrate employability skills for a specific career.

CS.11.02: Design and conduct a scientific investigation

Level 1

CS.11.02.01.a. Design an experiment or scientific inquiry for a specific project.

Level 2

CS.11.02.01.b. Implement an experimental design to test a formulated hypothesis.

Level 3

CS.11.02.01.c. Propose additional studies based on the results of an experiment.

## 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.

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: Reading for Literacy in Science and Technical Subjects

Key Ideas and Details (9-10)

3 - Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

Craft and Structure (9-10)

4 - 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 9–10 texts and topics.

Integration of Knowledge and Ideas (9-10)

7 - Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

Craft and Structure (11-12)

4 - 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.

Integration of Knowledge and Ideas (11-12)

**Science**

Life Sciences

HS-LS1 From Molecules to Organisms: Structures and Processes

HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

HS-LS1-6. Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

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.

**Social Studies**

**Writing**

CC: Writing for Literacy in History/Social Studies, Science, and Technical Subjects (11-12)

2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

2a - 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.

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.

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

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.

## 21st Century Skills

### LEARNING AND INNOVATION

**Creativity and Innovation**
- ☐ Think Creatively
- ☐ Work Creatively with Others
- ☐ Implement Innovations

**Creative Thinking and Problem Solving**
- ☑ Reason Effectively
- ☐ Use Systems Thinking
- ☐ Make Judgements 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**
- ☐ Mange 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

| Unit 3 PROPAGATION,, ASEXUAL, SEXUAL, OFFSETS, AIR LAYER,STRUCTURES | Hours: 60 |
|---|---|

**Performance Assessment(s):**

Skill assessment with rubrics- examination of student projects on planting, and cultural care
Reflections- in horticulture notebook and plant identification portfolio
Unit tests
Projects include- propagation of plants using different methods of propagation- sexual (seeds), asexual (cuttings, offsets ,air layer) , structures (corms, tubers, bulbs, tuberous roots, and rhizomes)- in our outside beds and greenhouse

**Leadership Alignment:**

Work effectively in a group
Demonstrate proper safety practices to prevent injury
Record keeping of plant progress and care
Lifelong learning goals
Global awareness
Participation in Floriculture CDE

## Standards and Competencies

PS.01.02: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems

Level 1

PS.01.02.02.a Identify the components, the types and the functions of plant roots

PS.01.02.03.a Identify the components and the functions of plant stems

PS.01.02.04.a.Discuss Leaf morphology and the functions of leaves

PS.01.02.05.a Identify the components of a flower, the functions of a flower and the functions of flower components

PS.01.02.06.a.Explain the functions and components of seeds and fruit

Level 2

PS.01.02.03.b Describe the processes of translocation

PS.01.02.04.b.Explain how leaves capture light energy and allow for the exchange of gasses

Level 3

PS.01.02.02.c.Relate the active and passive transport of minerals into and through the root system to plant nutrition.

PS.01.02.06.c Apply the knowledge of seed and fruit structures to plant culture and use.

PS.03.01: Demonstrate plant propagation techniques.

Level 1

PS.03.01.01.a Explain pollination, cross-pollination and self-pollination of flowering plants.

PS.03.01.02.a Demonstrate sowing techniques and provide favorable conditions for seed germination.

PS.03.01.03.a Describe optimal conditions for asexual propagation and demonstrate techniques used to propagate plants by cuttings, division, separation and layering

Level 2

PS.03.01.01.b Diagram the process of plant fertilization

PS.03.01.02.b Handle seed to overcome seed dormancy mechanisms and to maintain seed viability and vigor.

PS.03.01.05.b Give examples of the risks and advantages associated with genetically modified plants.

Level 3

PS.03.01.01.c Design and implement a plan to control the pollination of plants PS.03.01.02.c

Conduct tests associated with seed germination rates, viability and vigor. PS.03.01.03.c

Evaluate asexual propagation practices based on productivity and efficiency.

CS.11.02: Design and conduct a scientific investigation

Level 1

CS.11.02.01.a. Design an experiment or scientific inquiry for a specific project.

Level 2

CS.11.02.01.b. Implement an experimental design to test a formulated hypothesis.

Level 3

CS.11.02.01.c. Propose additional studies based on the results of an experiment.

## 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

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: Reading Informational Text

Craft and Structure (9-10)

4 - Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings; analyze the cumulative impact of specific word choices on meaning and tone (e.g., how the language of a court opinion differs from that of a newspaper).

Key Ideas and Details (11-12)

3 - Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the 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.

### Science

Life Sciences

HS-LS1 From Molecules to Organisms: Structures and Processes

HS-LS1-5. Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

**Social Studies**

**Writing**

## 21st Century Skills

### LEARNING AND INNOVATION

**Creativity and Innovation**
- ☐ Think Creatively
- ☐ Work Creatively with Others
- ☑ Implement Innovations

**Creative Thinking and Problem Solving**
- ☑ Reason Effectively
- ☐ Use Systems Thinking
- ☑ Make Judgements 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**
- ☑ Mange 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

## Unit 4 ENVIRONMENTAL- CULTURAL, MEDIA, IPM, NUTRITIONAL,STRUCTURES | Hours: 60

**Performance Assessment(s):**

Project skill assessment with rubric including--
Plant identification- observations of the plants stem, leaf structure , margins, flowering,
and Plant reproduction
Understanding the light, water, humidity requirements for each plant studied
Understanding of the growth structure that are necessary for plant reproduction
Soil-properties of different textures, and types
Soil pH-testing and use of amendment to change soil composition for optimum plant growth
Projects including the proper soil, light, water, and humidity to grow plants using different propagation methods
Plant pathology- pests, disease- signs, symptoms, and control
Pests- identification, reproduction, control - in greenhouse, homes and yards
Examination of fertilizer bags- macro and micro nutrients- advantages and disadvantages
Examination of pesticide bags and bottles- caution statements, and care of application, REI requirements
Exploring the plant zones within Washington state, using USDA, and Western Garden zonation maps
Unit tests
Reflective journal entries regarding the care of plants in students collection- in horticulture notebook

**Leadership Alignment:**

Students will:
Work effectively in a group
Demonstrate proper safety practices to prevent injury
Record keeping
Self-directed learning
Goal setting
Self-reflection on learning
Group work
Floriculture Operations CDE

**Standards and Competencies**

PS.02.01: Determine the influence of environmental factors on plant growth

Level 1

PS.02.01.01.a. Describe the qualities of light that affect plant growth

PS.02.01.02.a. Describe the effects air, temperature, and water have on plant metabolism, and growth

Level 2

PS.02.01.02.b. Determine the optimal air, temperature, and water conditions for plant growth

Level 3

PS.02.01.02.c Design, implement, and evaluate a plan to maintain optimal conditions for plant growth

PS.02.02: Prepare growing media for use in plant Systems

Level 1

PS 02.02.01.a. Identify the major components of growing media and describe how growing media support plants growth.

PS.02.02.02.a. Identify the categories of soil water

Level 2

PS 02.02.01.b Describe the physical characteristics of growing media and explain the influence they have on plant growth.

PS.02.02.02.b Discuss how soil drainage and water holding capacity can be improved

Level 3

PS.02.02.01.c. Formulate and prepare growing media and specific plants or crops.

PS.02.03: Develop and implement a fertilization plan for specific plants or crops

Level 1

PS.02.03.01.a. Identify the essential nutrients for plant growth and development and their major functions

PS.02.03.03.a Collect soil and plant tissue samples for testing and interpret the test results

PS.02.03.04.a. Identify fertilizer sources of essential plant nutrients, explain fertilizer formulations and describe different methods of fertilizer applications

Level 2

PS.02.03.01.b. Describe nutrient deficiency symptoms and recognize environmental causes of nutrient deficiencies

PS.02.03.04.b. Calculate the amount of fertilizer to be applied and calibrate equipment to apply the prescribed amount fertilizer

PS.03.02: Develop and implement a plant management plan for crop production.

Level 1

PS.03.02.04.a Observe and record environmental conditions during the germination, growth and development of a crop.

Level 2

PS.03.02.01.b Inspect propagation material for evidence of pests or disease.

PS.03.02.02.b Prepare soil for planting with the addition of amendments.

PS.03.02.04.b Monitor the progress of plantings and determine the need to adjust environmental conditions.

PS.03.02.05.b Demonstrate proper techniques to control and manage plant growth through mechanical, cultural or chemical means.

Level 3

PS.03.02.02.c Prepare growing media for planting.

## Aligned to Washington State Standards

**Arts**

**Communication - Speaking and Listening**

**Health and Fitness**

**Language**

**Mathematics**

**Reading**

**Science**

Life Sciences

HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

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-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

**Social Studies**

**Writing**

## 21st Century Skills

### LEARNING AND INNOVATION

**Creativity and Innovation**

- ☐ Think Creatively
- ☐ Work Creatively with Others
- ☑ Implement Innovations

**Creative Thinking and Problem Solving**

- ☑ Reason Effectively
- ☑ Use Systems Thinking
- ☑ Make Judgements 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**

- ☑ Mange 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

## Unit 5 IDENTIFICATION- LITERACY, RESEARCH | Hours: 60

**Performance Assessment(s):**

Portfolio-plant Identification books using national FFA lists, classification of plants by family, genus, species, and cultivar, including propagation and cultural requirements
Presentation-group presentations on plants in units
Unit tests

**Leadership Alignment:**

Demonstrate proper safety practices to prevent injury
Self-directed learning
Floriculture CDE

### Standards and Competencies

PS.01.02: Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems

Level 1

PS.01.02.01.a Diagram a typical plant cell and identify plant cell organelles and their functions

PS.01.02.02.a Identify the components, the types and the functions of plant roots

PS.01.02.03.a Identify the components and the functions of plant stems PS.01.02.04.a.Discuss

Leaf morphology and the functions of leaves

PS.01.02.05.a Identify the components of a flower, the functions of a flower and the functions of flower components

PS.01.02.06.a.Explain the functions and components of seeds and fruit

Level 2

PS.01.02.01.b.Compare and contrast mitosis and meiosis

PS.01.02.03.b Describe the processes of translocation

PS.01.02.06.b.Identify the major types of fruit

### 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.

**Health and Fitness**

**Language**

**Mathematics**

**Reading**

CC: Reading for Literacy in Science and Technical Subjects

Key Ideas and Details (9-10)

1 - Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

Craft and Structure (9-10)

4 - 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 9–10 texts and topics.

5 - Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy).

Range of Reading and Level of Text Complexity (9-10)

10 - By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently

Key Ideas and Details (11-12)

1 - 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.

Craft and Structure (11-12)

4 - 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.

Integration of Knowledge and Ideas (11-12)

10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

## Science

## Social Studies

## Writing

## 21st Century Skills

### LEARNING AND INNOVATION

**Creativity and Innovation**

- ☐ Think Creatively
- ☐ Work Creatively with Others
- ☐ Implement Innovations

**Creative Thinking and Problem Solving**

- ☑ Reason Effectively
- ☐ Use Systems Thinking
- ☑ Make Judgements 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**

- ☐ Mange 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

## Unit 6 SAFETY | Hours: 45

**Performance Assessment(s):**

Unit test
Skill assessment with rubrics- worker protection safety (WPS), including REI, heat stress for working safely in the greenhouse and beds, safe practices assessment and evaluation, and emergency procedures
Presentations- worker protection -and safe practices necessary for greenhouse work,
Information on safe handling of greenhouse chemicals- fertilizers, pesticides, herbicides, and environmental hazards
Projects- oral presentations where students examine current practices in our greenhouse, city, county, state, country, and internationally, why those practices are in place, and possible Solutions to environmental problems

**Leadership Alignment:**

Demonstrate proper safety practices to prevent injury
Record keeping
Self-directed learning
Goal setting
Floriculture CDE

### Standards and Competencies

CS.06.01: Observe required regulations to maintain/improve safety, health and environmental management systems

Level 1

CS.06.01.01.a. Examine major health, safety, and environmental management system components in AFNR organizations.

Level 3

CS.06.01.01.c. Assess how AFNR organizations promote improved health, safety, and environmental performance and suggest plans for improvement.

CS.06.02: Develop a plan to maintain and improve health, safety and environmental compliance and performance

Level 1

CS.06.02.01.a. Use proper safety practices/personal protective equipment.

Level 2

CS.06.02.01.b. Develop plans to improve health, safety and environmental performance.

Level 3

CS.06.02.01.c. Educate other workers to improve health, safety, and environmental performance in a safe manner.

CS.06.03: Provide health, safety, and environmental operating guidelines.

Level 1

CS.06.03.01.a. Demonstrate the importance of safety, health, and environmental practices in the workplace.

Level 3

CS.06.03.01.c. Establish a set of health, safety, and environmental principles to ensure a high level of performance.

CS.07.01: Apply safety/health practices to AFNR worksites.

Level 1

CS.07.01.01.a Implement the health and safety policies and procedures relevant to AFNR careers.

Level 2

CS.07.01.01.b. Use appropriate personal protective equipment for a given task.

Level 3

CS.07.01.01.c. Orient a group on safety measures based on the prescribed safety guidelines.

CS.07.03: Follow appropriate procedures in case of an emergency.

Level 1

CS.07.03.01.a. Evaluate the emergency response procedures for a natural disaster.

Level 2

CS.07.03.01.b. Develop various emergency response plan requirements for a facility.

Level 3

CS.07.03.01.c. Communicate the appropriate responses for medical emergencies by following the approved procedures.

## Aligned to Washington State Standards

### Arts

### Communication - Speaking and Listening

### Health and Fitness

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

3.1.2 Analyzes how environmental factors impact health.

3.1.3 Evaluates environmental risks associated with certain occupational, residential, and recreational choices.

### Language

### Mathematics

### Reading

### Science

### Social Studies

### Writing

CC: Writing for Literacy in History/Social Studies, Science, and Technical Subjects (11-12)

2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

2d - 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.

2e - 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).

## 21st Century Skills

### LEARNING AND INNOVATION

**Creativity and Innovation**
- ☐ Think Creatively
- ☐ Work Creatively with Others
- ☐ Implement Innovations

**Creative Thinking and Problem Solving**
- ☑ Reason Effectively
- ☐ Use Systems Thinking
- ☑ Make Judgements 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**
- ☐ Mange 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

## Unit 7 ELEMENTS OF DESIGN AND MARKETING-FLORAL, LANDSCAPE | Hours: 45

**Performance Assessment(s):**

Unit test
Reflection- in horticulture notebooks regarding self-assessment of design
Portfolio- designs most commonly used for employment in industry, photos of floral projects, elements of design in the project, and flowers used, including resume.
Application of design principles to the concepts of outdoor rooms and landscape design.
Presentations - Examination of different color schemes , themes, and events for employment in industry
Projects- working to complete projects ordered for our school flower shop- all designs are included in portfolio, ordering flowers, and pricing of arrangements for orders, drawing in Scale a landscaping area, including plants and hard scaling. Pricing of project is included

**Leadership Alignment:**

Demonstrate proper safety practices to prevent injury
Record keeping
Floriculture CDE
Self-directed learning
Self-reflection on arrangements
Global awareness
Lifelong learning goals
Plant and floral sales
Business and entrepreneurial literacy

**Standards and Competencies**

PS.03.05: Harvest, handle and store crops

Level 1

PS.03.05.01.a Identify harvesting methods and harvesting equipment.
PS.03.05.02.a Explain reasons for calculating crop yield and loss.
PS.03.05.03.a Identify storage methods for plants and plant products.
PS.03.05.04.a Explain the reasons for preparing plants and plant products for distribution.

Level 2

PS.03.05.01.b Assess the stage of growth to determine crop maturity or salability and demonstrate proper harvesting techniques.
PS.03.05.02.b Evaluate crop yield and loss data.
PS.03.05.03.b Explain the proper conditions to maintain the quality of plants and plant products held in storage.
PS.03.05.04.b Demonstrate techniques for grading, handling and packaging plants and plant products for distribution.

Level 3

PS.03.05.02.c. Implement plans to reduce crop loss
PS.03.05.03.c Monitor environmental conditions in storage facilities for plants and plant products.
PS.03.05.04.c Evaluate techniques for grading, handling and packaging plants and plant products.

PS.04.01: Create designs using plants.

Level 1

PS.04.01.01.a. Define design and identify design elements.
PS.04.01.02.a. Discuss the applications of art in agriculture/horticulture.

Level 2

PS.04.01.01.b. Explain design elements of line, form, texture and color and express the visual effect each has on the viewer.
PS.04.01.02.b. Discuss principles of design that form the basis of artistic impression.

Level 3

PS.04.01.01.c Select plants, hard goods, supplies and other materials for use in a design based on a range of criteria.

PS.04.01.02.c. Create and implement designs by following established principles of art.

CS.03.01: Communication: Demonstrate oral, written and verbal skills

Level1

CS.03.01.01.a. Use basic technical and business writing skills. Level I

CS.03.01.03.a. Develop an outline or plan for a business presentation.

Level 2

CS.03.01.01.b. Select the appropriate form of technical and business writing or communication for a specific situation.

CS.03.01.03.b. Deliver a business presentation for a peer group (e.g., class presentation).

Level 3

CS.03.01.01.c. Demonstrate technical and business writing skills to communicate effectively with co-workers and supervisors.

CS.08.02: Use appropriate protective equipment and handle AFNR tools and equipment to demonstrate safe and proper use of the tools and equipment.

Level 1

CS.08.02.01.a. Use the appropriate procedures for the use and operation of specific tools and equipment.

Level 2

CS.08.02.01.b. Demonstrate safety precautions when using tools for a specific task around bystanders.

Level 3

CS.08.02.01.c. Operate applicable AFNR equipment and vehicles safely.

CS.09.01: Apply economic principles to AFNR systems (e.g., supply, demand and profit).

Level 1

CS.09.01.01.a. Calculate the effect of compound interest on AFNR investments.

Level 2

CS.09.01.01.b. Describe the economic impacts of natural resource preservation vs. use of the resource.

Level 3

CS.09.01.01.c. Describe the impacts of AFNR decisions on global markets and environmental health.

## Aligned to Washington State Standards

### Arts

Arts 1.0 T h e student understands and applies arts knowledge and skills in dance, music, theatre, and visual arts.

1.1 Understands and applies arts concepts and vocabulary.

1.3 Understands and applies arts genres and styles from various artists, cultures, and times.

1.4 Understands and applies audience conventions in a variety of arts settings and performances.

Arts 2.0 the student demonstrates thinking skills using artistic processes.

- Identifies audience and purpose.
- Implements choices of arts elements, principles, foundations, skills, and techniques in a creative work.
- Refines work based on feedback, self-reflection, and aesthetic criteria.

2.2 Applies a performance and/or presentation process to the arts (dance, music, theatre and visual arts):

- Rehearses, adjusts, and refines through evaluation, reflection and problem solving.
- Reflects and self-evaluates work and/or performance to set goals.

2.3 A p p l i e s a responding process to an arts performance and/or presentation of dance, music, theatre and visual arts):

- Engages the senses actively and purposefully in perceiving the work.

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.

3.3. Develops personal aesthetic criteria to communicate artistic choices.

Arts 4.0 The student makes connections within and across the arts to other disciplines, life, cultures and work.

4.4. Understands how the arts influence and reflect culture/civilization, place and time.

4.5. Understands how arts knowledge and skills are used in the world of work including careers in the arts.

**Communication - Speaking and Listening**

**Health and Fitness**

**Language**

CC: College and Career Readiness Anchor Standards for Language

Conventions of Standard English

1 - Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

2 - Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

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.

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**

**Reading**

CC: Reading for Literacy in Science and Technical Subjects

Key Ideas and Details (9-10)

3 - Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks attending to special cases or exceptions defined in the text.

Craft and Structure (9-10)

4 - 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 9–10 texts and topics.

Integration of Knowledge and Ideas (9-10)

7 - Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.

Range of Reading and Level of Text Complexity (9-10)

10 - By the end of grade 10, read and comprehend science/technical texts in the grades 9–10 text complexity band independently and proficiently

Key Ideas and Details (11-12)

1 - 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.

3 - 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.

Craft and Structure (11-12)

4 - 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.

Integration of Knowledge and Ideas (11-12)

Range of Reading and Level of Text Complexity (11-12)

10 - By the end of grade 12, read and comprehend science/technical texts in the grades 11–12 text complexity band independently and proficiently.

**Science**

**Social Studies**

**Writing**

## 21st Century Skills

### LEARNING AND INNOVATION

**Creativity and Innovation**

- [x] Think Creatively
- [ ] Work Creatively with Others
- [ ] Implement Innovations

**Creative Thinking and Problem Solving**

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

**Communication and Collaboration**

- [x] 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**

- [x] Adapt to Change
- [x] Be Flexible

**Initiative and Self-Direction**

- [x] Mange Goals and Time
- [x] Work Independently
- [ ] Be Self-Directed Learners

**Social and Cross-Cultural**

- [ ] Interact Effectively with Others
- [ ] Work Effectively in Diverse Teams

**Productivity and Accountability**

- [x] Manage Projects
- [x] Produce Results

**Leadership and Responsibility**

- [ ] Guide and Lead Others
- [ ] Be Responsible to Others

## Unit 8 LEADERSHIP | Hours: 30

**Performance Assessment(s):**

Reflection- self assessment of skills and projects completed- in horticulture notebook- examination of skills, and improvement of those skills
Demonstration of safety practices while working in the school floral shop and greenhouse safe
Record keeping- journalize in horticulture notebook regarding plant propagation and care
Presentation- presentations skills (planning, organization of thoughts and ideas, preparation of presentation to audience- groups include student, staff, district, and civic groups
Including master Gardeners of Spokane County- presentations in various media formats- newspapers, television, and electronic media-record keeping for spring planting companies
Portfolio- of presentations planned and presented
Project- presentation of floral project and ideas to civic groups ( ex. Pearl Harbor survivors, Master Gardeners) , with presentations, completion of floral ideas presented.
Planting companies for school plant sale advertisements regarding crops propagated from seed, crop information, care brochure, planting records with weekly journalization

**Leadership Alignment:**

Work effectively in a group
Demonstrate proper safety practices to prevent injury
Record keeping
Group work
Floriculture
CDE
Self-directed learning
Lifelong learning goals
Goal setting
Plant and floral sales
Business and entrepreneurial literacy

### Standards and Competencies

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

Level 1

CS.01.01.01.a. Work productively with a group or independently.
CS.01.01.02.a. Create a task analysis.
CS.01.01.03.a. Exhibit good planning skills for a specific task or situation.
CS.01.01.04.a. Explore available resources to assist in meeting project needs.
CS.01.01.05.a. Assess the physical, financial and professional risks associated with a particular task.
CS.01.01.06.a. Identify the strengths/talents of team members needed to achieve a desired task.
CS.01.01.07.a. Set personal goals using the SMART goals method (Specific, Measurable, Approved by you, Realistic, Time-stamped).

Level 2

CS.01.01.01.b. Demonstrate the ability to complete a task without assistance.
CS.01.01.02.b. Create measurable objectives for a given situation.
CS.01.01.03.b. Assess individual strengths and weaknesses in planning.
CS.01.01.04.b. Use appropriate and reliable resources to complete an action or project.
CS.01.01.05.b. Create a plan for performing a job that will minimize physical, financial and professional risks.
CS.01.01.06.b. Assign project parts equitably amongst team members to achieve a given task.
CS.01.01.07.b. Use a variety of strategies to evaluate goals (e.g., observe, apply, and demonstrate).

Level 3

CS.01.01.01.c. Work independently and in group settings to accomplish a task.
CS.01.01.02.c. Assess outcomes to determine success for a task.
CS.01.01.03.c. Implement an effective project plan.
CS.01.01.04.c. Create resources to complete an action or project.

CS.01.01.06.c. Develop strengths and talents of team members so that all can achieve success.
CS.01.01.07.c. Evaluate actions taken and make appropriate modifications to personal goals.

CS.01.06: Continuous Improvement: Pursue learning and growth opportunities related to professional and personal aspirations.

Level 1

CS.01.06.01.a. Explain the reasons for having a leadership/personal growth plan.
CS.01.06.03.a. Identify the different types of problem solving models and their applicability to specific situations.
CS.01.06.04.a. Use various emerging technologies to enhance a program or project.

Level 2

CS.01.06.01.b. Develop a plan that includes specific goals for leadership and personal growth.
CS.01.06.02.b. Identify areas where a personal mentor could be helpful.
CS.01.06.03.b. Utilize a problem-solving model to solve a given problem.

Level 3

CS.01.06.01.c. Implement a leadership and personal growth plan.
CS.01.06.03.c. Use problem solving strategies to solve a professional or personal issue.
CS.01.06.05.c. Implement a plan to develop new knowledge and skills related to professional and personal aspirations.

CS.02.03: Professional Growth: Develop awareness and apply skills necessary for achieving career success.

Level 1

CS.02.03.01.a. Explore various career interests/options.
CS.02.03.02.a. Chart the components to creating a balanced work/life plan.
CS.02.03.03.a. Identify the skills required for various careers.

Level 2

CS.02.03.01.b. Make decisions to plan for a personal career.
CS.02.03.02.b. Determine the level of non-essential actions/tasks related to personal and work life.
CS.02.03.03.b. Develop skills required for a specific career.

Level 3

CS.02.03.01.c. Implement a plan to achieve career goals and priorities.
CS.02.03.02.c. Balance personal and work responsibilities.
CS.02.03.03.c. Demonstrate employability skills for a specific career.

CS.03.01: Communication: Demonstrate oral, written and verbal skills

Level1

CS.03.01.01.a. Use basic technical and business writing skills. Level I
CS.03.01.02.a. Describe the various types and uses of resumes.
CS.03.01.03.a. Develop an outline or plan for a business presentation.

Level 2

CS.03.01.01.b. Select the appropriate form of technical and business writing or communication for a specific situation.
CS.03.01.02.b. Prepare a resume.
CS.03.01.03.b. Deliver a business presentation for a peer group (e.g., class presentation).

Level 3

CS.03.01.01.c. Demonstrate technical and business writing skills to communicate effectively with co-workers and supervisors.
CS.03.01.02.c. Demonstrate effective use of a resume as part of an effort to obtain a job.
CS.03.01.03.c. Make effective business presentations.

CS.03.02: Decision Making: Analyze situations and execute an appropriate course of action.

Level 1

CS.03.02.01.a. Analyze the steps in the decision-making process.

CS.03.02.02.a. Select resources to help in the problem-solving process.

CS.03.02.03.a. Differentiate between ethical and unethical behavior.

CS.03.02.04.a. Use an interest inventory to determine goals appropriate to personal passions, abilities and aptitudes.

Level 2

CS.03.02.01.b. Utilize the process used to reach a conclusion for a decision.

CS.03.02.02.b. Determine information that is critical to solving problems.

CS.03.02.03.b. Practice ethical behaviors.

CS.03.02.04.b. Assess personal skills to set goals for success in a career.

Level 3

CS.03.02.01.c. Make decisions for a given situation by applying the decision making process.

CS.03.02.02.c. Use problem-solving skills

CS.03.02.03.c. Examine an ethical dilemma and prepare an argument for a position.

CS.03.02.04.c. Implement appropriate preparation plans for a career path based on passion, abilities, aptitude, opportunities.

CS.03.03: Flexibility / Adaptability: Describe traits that enable one to be capable and willing to accept change

Level 1

CS.03.03.01.a. Research current and emerging technologies in AFNR.

CS.03.03.02.a. Select the appropriate process to initiate effective change for a given situation.

CS.03.03.03.a. Access to the value of providing feedback.

Level 2

CS.03.03.01.b. Analyze the advantages and disadvantages of current and emerging technologies in AFNR activities.

CS.03.03.02.b. Assess the benefits of using the change process.

CS.03.03.03.b. Differentiate between positive and negative constructive feedback and realize the importance of both.

Level 3

CS.03.03.01.c. Conduct a workplace study to assess the benefits to adapting emerging technologies.

CS.03.03.02.c. Evaluate strategies that can be used to manage change within the workplace.

## Aligned to Washington State Standards

**Arts**

**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.

3 - Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

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.

6 - Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

**Health and Fitness**

**Language**

**Mathematics**

**Reading**

**Science**

**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.

3 - Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

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.

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.

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.

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

Range of Writing

10 - Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

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

Text Types and Purposes

1c - Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

1d - Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

1e - Provide a concluding statement or section that follows from or supports the argument presented.

2 - Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

2a - Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.

2b - Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience's knowledge of the topic.

2c - Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.

2d - Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.

2e - Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are 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.

5 - Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

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.

Research to Build and Present Knowledge

7 - Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

8 - Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.

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

Range of Writing

10 - 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.

## 21st Century Skills

### LEARNING AND INNOVATION

**Creativity and Innovation**

- [x] Think Creatively
- [x] Work Creatively with Others
- [x] Implement Innovations

**Creative Thinking and Problem Solving**

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

**Communication and Collaboration**

- [x] Communicate Clearly
- [x] Collaborate with Others

### INFORMATION, MEDIA AND TECHNOLOGY SKILLS

**Information Literacy**

- [x] Access and Evaluate Information
- [x] Use and Manage Information

**Media Literacy**

- [ ] Analyze Media
- [ ] Create Media Products

**Information, Communications, and Technology (ICT Literacy)**

- [x] Apply Technology Effectively

### LIFE AND CAREER SKILLS

**Flexibility and Adaptability**

- [x] Adapt to Change
- [x] Be Flexible

**Initiative and Self-Direction**

- [x] Mange Goals and Time
- [x] Work Independently
- [x] Be Self-Directed Learners

**Social and Cross-Cultural**

- [x] Interact Effectively with Others
- [x] Work Effectively in Diverse Teams

**Productivity and Accountability**

- [x] Manage Projects
- [x] Produce Results

**Leadership and Responsibility**

- [x] Guide and Lead Others
- [x] Be Responsible to Others