

# Galt Joint Union High School District

Save

Submit

## Course Design (version updated 3/31/15)

Reset

Print

Course Title:	Environmental Horticulture Science	Course Number:	
Authors:	Mandy Garner		

### Curriculum

This course meets UC a-g requirements in:	d - Laboratory Science	<input type="checkbox"/> UC a-g Approved	<input type="checkbox"/> NCAA Approved
---	------------------------	--	--

Is this course part of one of the following programs?

- ☐ AP/Honors
- ☒ CTE
- ☒ Perkins
- ☐ Special Education
- ☐ Dual Enrollment

Other:

How is course related to district goals?

- ☒ T2: Teachers will share lessons with their resource colleagues to expose all students to the same high-level materials and curriculum that require higher-level thinking and allow for open-ended responses.
- ☒ T3: Teachers will communicate objectives for all lessons so students are aware of what is expected.
- ☒ T4: Teachers will raise expectations and level of rigor for all students, regardless of current levels of achievement, to ensure their continuous growth and development.

Grade Level:

- ☐ 9th ☒ 11th
- ☒ 10th ☒ 12th

Course Term:

Year

Number of Credits:

10

Prerequisites/Co-Requisites:

This course meets graduation requirements in the area(s) of:

This course is equivalent to (if any):

This course replaces (if any):

Textbooks

ISBN #

Cost

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="+"/>	<input type="button" value="▲"/>
			<input type="button" value="-"/>	<input type="button" value="▼"/>

### Approval Process

Signature

Date

Administration Approval:

Curriculum Committee Approval:

Board Approval:

Dates Of:

Original Adoption:  Current Revision:  Last Revision:  Next Revision:

### **Course Overview/Description:**

The course description should emphasize the core knowledge and skills students are expected to learn throughout the course, including concepts, theory and texts. There should be clear evidence of the course's level of rigor and the development of essential critical thinking skills. This is the description that will be used in the course catalog.

This course is also designed to instruct students in the growth, production, and care of plants for ornamental and environmental purposes. Students will learn plant taxonomy, physiology, reproduction, growth, identification, propagation, soils, integrated pest management, landscape design, vegetable production, and floral design. Students will be introduced to careers in environmental plant science as it is one of the fastest growing sectors in the agricultural industry.

### **Instructional Materials List:**

List any instructional materials that will be needed to complete the formative and summative assessments described in this document, as well as any other materials that are required or optional for the course. Instructional Materials include: Textbooks, Literary texts, Manuals, Periodicals, Scholarly articles, Websites, Primary documents, Multimedia.

Instructional Materials must be aligned with Education Code Sections 60040-60044, 60048, and 60200 requiring that instructional materials portray accurately and equitably the cultural and racial diversity of American society; the male and female roles; and the contributions of minority groups and males and females to the development of California and the United States. For further information, go to: <http://www.cde.ca.gov/ci/cr/cf/documents/socialcontent.pdf#search=instructional%20materials%20guidelines&view=FitH&pagemode=none>

Instructional Materials	ISBN #	Cost		
Integrated Pest Management for Floriculture and Nurseries	1,879,906,465	45	+	▲
			-	▼
Container Nursery Production and Business Management Manual	9,781,601,078,421	40	+	▲
			-	▼
Natural Enemies Handbook	9,781,879,906,419	45	+	▲
			-	▼
Postharvest Technology of Horticultural Crops	1,879,906,511	65	+	▲
			-	▼

### **Department Requirements:**

Departments are invited to add additional pieces as appendices that are germane to their particular subject. For example, English might specify the required number of written pieces or non-fiction or fiction pieces expected to be addressed for the school year. Social Science may designate DBQs and/or current events must be addressed in all Social Science course.

### **Department Approval of the Course:**

All courses must be designed using the template provided, recommended by consensus of the department members who are credentialed to teach the proposed course.

	Signature	Date
Department Chair Review:	Mandy Garner	Sep 7, 2016
Department Chair/Member Review:	Bryan Dodson	Sep 7, 2016
Department Chair/Member Review:	Melissa Porter	Sep 7, 2016



## Course Outline

**Essential Question/Component** - the goal of the unit written as a question or statement (units can have more than 1 essential question).

**Unit Description** - a brief description of the topics to be addressed in the unit that demonstrates the critical thinking, depth and progression of content covered.

**Performance Task/Assessment** - a form of authentic assessment in which students must demonstrate that they have mastered a particular set of skills or competencies by performing or producing something (e.g. write an essay, develop an experiment, develop and present a presentation to the class, solve a complex, real-world math problem).

**Formative Task/Assessment** - A task in which students demonstrate and improve their progress toward mastering the skills and content of the unit

**Summative Task/Assessment** - A culminating task in which students demonstrate a deep understanding of the Essential Question of the Unit.

### Essential Questions/ Components (Units)

What are plants?

Students will identify each part of the plant including the types of roots (fibrous and tap), stem function (xylem and phloem) and leaf structures (simple and compound). Students will describe the parts of a plant cell and their function. Students will identify flower structures and functions and be able to describe the process of pollination. We will identify the parts of a complete flower and explain the role flowers play in fruit and sexual reproduction.

How and when do plants grow?

Students will describe the growing cycles and processes of plants including; photosynthesis, carbon cycle, water cycle, Nitrogen cycle, and the formation of soil. Students will explore the soil forming factors, soil texture, soil types, and soil profiles and describe the effects of weathering on parent material and the effects erosion plays on soil. Students will design their own soil mix and be able to explain the basics of soil amendments for improving soil. Students will read and interpret fertilizer labels and will compost their own fertilizer and understand the macro and micro nutrients necessary for plant growth and be able to identify nutrient deficiency symptoms in plants. Students will explore the pH of soil and plants that grow in a high acidic soil. Students will explore soil water holding capacities, water management practices, and how to properly water plants. Students will be able to explain the lifecycle of the annual, biennial, and perennial flowers, as well as identify four uses, and demonstrate transplanting techniques of each flower.

### Performance Tasks/Assessments

#### Formative

Root Collection Lab  
Water Movement Lab  
Leaf Collection Lab  
Plant Cell Lab  
Dissection and Part I.D. Lab  
The Flower Project Lab

#### Summative

Project Based Learning: Fruit Spoilage Lab

#### Project Based Learning:

Students study the pollution map of California and research the role of agriculture on pollution. Students interview an innovative agriculturalists on what the industry is doing to reduce pollution in our local area. Using industry advice and experience, students create and carry out a plan to reduce pollution on our campus.

Project Based Learning:  
Compare LRHS Sustainable Farm records to growing chart for Sacramento County and make recommendations for next year's planting schedule.

Essential Questions/ Components (Units)	Unit Descriptions	Performance Tasks/Assessments	Summative
		Formative	
How are plants identified?	Students will understand the how and why of plant nomenclature and plant taxonomy. They will explain why scientific names are used, the difference between genus, species, and variety, and list five plants by their common and scientific names.	Plant Name Lab	<div> <div>+</div> <div>-</div> </div> <div>           Project Based Learning: Study a culture of native plants, identify its uses in its native country, and compare/contrast how the name corresponds to its origin and use         </div>
How are plants propagated sexually and asexually?	Students will understand sexual plant reproduction by identifying the parts of the seed and the function and will be able to describe the difference between direct and indirect seeding. Students will explain the process of hardening of seedlings and demonstrate transplanting techniques by completing the Transplanting Lab from seedling to sellable container. Students will utilize bottom heat and understand why it is important in plant propagation. Students will learn how to propagate softwood or semi hardwood plants from cuttings, root, leaf, and stem cuttings, grafting, division, and layering. Students will understand the use of rooting hormone and bottom heat in propagating plants as growth stimulants, or growth inhibitors.	Seed Dissection and I.D. Lab Sexual Reproduction Lab Germination Lab Transplanting Seedlings to Saleable Containers Lab Softwood, Semi-Hardwood, and Herbaceous Cuttings and Grafting, Division, and Layering Lab Growth Delay Lab Rooting Hormone vs. Non Rooting Hormone Lab Visit a greenhouse and apply propagation techniques observed	<div> <div>+</div> <div>-</div> </div> <div>           Project Based Learning: Propagate a flat of houseplants, annuals, perennials, and vines for the plant sale.         </div>
How do you utilize and care for a greenhouse?	Students will understand cultural practices for growing greenhouse crops as well as tools and equipment within a greenhouse including retractable roof settings for lighting, automatic watering systems, heating, cooling systems (fans, vents, and swamp cooler), germination chamber, and bottom heat.	Greenhouse Care and Maintenance Procedures Greenhouse Tour/Field Trip Guest Speakers	<div> <div>+</div> <div>-</div> </div> <div>           Greenhouse Care and Maintenance Roles         </div>



## Essential Questions/ Components (Units)

### Unit Descriptions

### Performance Tasks/Assessments

#### Formative

#### Summative

What are the basic principles of weed and pest management and Integrated Pest Management?

Students will be able to identify insects, their parts, and describe the lifecycle of an insect and the timing of insecticide application. Students will identify the ten most harmful insects to plants and explain the use of chemical insecticides to control insects on plants. Students will identify signs of fungus, rodents, molluscs, and nematodes and one control agent to treat them. Students will identify the degrees of toxicity of a given pesticide and properly read a pesticide label. Students will evaluate safety scenarios and identify proper insecticide, herbicide, and fungicide protocols and procedures used by pest control advisors in industry. Students will practice natural remedies and natural predators. Students will identify common weeds, their life cycle, and prevention methods. Students will research and explain the use of chemicals on weeds including the difference between selective and non-selective herbicides. Students will research organic farming including cultural practices such as the use of non-synthetic fertilizer, pesticide, herbicides, and fungicides, and organic seed.

Project Based Learning: Students will develop an Integrated Pest Management Plan for the LRHS Greenhouse



How do you design and install a landscape including turf grass?

Students will utilize the elements of design and basic understanding of landscaping planning to design and construct a landscape design. Students will practice knowledge of plant selection and placement using annual and perennial flowers, deciduous shrubs, and trees. Students will demonstrate their knowledge of establishing, maintaining and restoring a lawn through the design, installation, and maintenance of turf plots. Students will demonstrate the five steps in seeding a lawn, the proper use of fertilizer on a lawn, the difference between cool season and warm season grasses, and the step by step approach to renovate a lawn. Students will research the types of irrigation systems and install the most appropriate to properly irrigate and conserve water.

Project Based Learning: Students will design and install a landscape in the City of Galt utilizing Liberty Ranch grown plants for a community organization, low-income family, or someone in need. Project Based Learning Project: Work with grounds and maintenance at school or in the City of Galt to renovate a designated lawn area on campus or in town



How do you market plant crops for sale?

Students will demonstrate the ability to market plant crops by creating a marketing plan for the plant sale which includes a flyer to accompany a specific crop with a determined market price. Students will create a sales display for a specific plant crop, and practice their sales ability during plant sales and farmer's markets.

Marketing Plan Critiques

Project Based Learning: Plant Sale Marketing Plan  
Project Based Learning: Plant Sale and Farmer's Market Salesmanship



Essential Questions/ Components (Units)	Unit Descriptions	Performance Tasks/Assessments	
		Formative	Summative
What are the career opportunities in horticulture?	Students will explore, research, and describe the levels of career opportunities available to individuals in the Horticulture industry. Numerous guest speakers, field trips, and mentorships will provide an array of exposure into the horticulture industry. Additionally, students will conduct a full-day job shadow with an industry partner in the area of horticulture.	Work based learning guest speakers, field trips, mentorships, job shadows reflections and share-outs.	Horticulture Certification



## **Engaging Learning Experiences**

### **(at least 1 formative and 1 summative performance assessment/task per Essential Question/Component)**

Provide details about each of the formative and summative tasks/assessments (at least 1 of each per Essential Question) that you identified in the previous section. Formative Tasks should develop and measure student progress toward mastery of key skills and knowledge that students need to be able to complete the summative assessment/performance task that will be given at the end of that particular unit. Summative Tasks require students to demonstrate their mastery of the content, skills and competencies gained in a unit by applying what they have learned accomplish a novel task.

For each lesson or activity, give the name and purpose, the question, skill or concept that students are learning, the Essential Question or Component the lesson addresses, a list of texts or materials that will be needed to complete the task, a description of the lesson and check which skill sets & strategies will utilized in the lesson.

Each activity must incorporate at least one or more of the skills and strategies. Each skill set (Literacy, Digital Literacy, 21st Century Skills) must be incorporated into at least 3 different lessons. Multiple skills and strategies can be incorporated into a single lesson. Each strategy (numeracy, relevant/real world application, inquiry or project-based learning, and integrated/cross-curricular learning) must be incorporated into at least 1 lesson. In your description, explain how the skills & strategies that you checked will be incorporated in the lesson.



## Engaging Learning Experiences

Name of Assessment	Essential Question/Component	Assessment Type
Dissection and Part I.D. Lab	What are plants?	Formative
<b>Objective of Assessment</b> Students will identify each part of the plant including the types of roots (fibrous and tap), stem function (xylem and phloem) and leaf structures (simple and compound). Students will describe the parts of a plant cell and their function based on anatomy and location in the plant.	<b>Required Texts/Materials</b> Class Textbook and Lab, Plants, Dissection Tools	<b>Skills/Strategies</b> <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input type="checkbox"/> Numeracy <input type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Skills and/or Concepts Assessed (Standards)</b> HS Inheritance and Variation of Traits HS-LS1-1, HS-LS1-2, HS-LS1-4		<div style="display: flex; justify-content: space-around; align-items: center;"> <span style="background-color: green; color: white; padding: 2px 5px;">+</span> <span style="background-color: red; color: white; padding: 2px 5px;">-</span> <span style="background-color: green; color: white; padding: 2px 5px;">▲</span> <span style="background-color: green; color: white; padding: 2px 5px;">▼</span> </div>
<b>Description of Assessment</b> Students will identify each part of the plant including the types of roots (fibrous and tap), stem function (xylem and phloem) and leaf structures (simple and compound). Students will describe the parts of a plant cell and their function based on anatomy and location in the plant. Students will be graded on completed lab report.		
Fruit Spoilage Lab	What are plants?	Summative
<b>Objective of Assessment</b> Students will identify each part of the plant and will be able to interpret the role it plays in food production.	<b>Required Texts/Materials</b> Class Textbook	<b>Skills/Strategies</b> <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input checked="" type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Skills and/or Concepts Assessed (Standards)</b> HS Inheritance and Variation of Traits HS-LS1-1, HS-LS1-2, HS-LS1-4, HS Weather and Climate HS-ESS2-4, HS-ESS3-5		<div style="display: flex; justify-content: space-around; align-items: center;"> <span style="background-color: green; color: white; padding: 2px 5px;">+</span> <span style="background-color: red; color: white; padding: 2px 5px;">-</span> <span style="background-color: green; color: white; padding: 2px 5px;">▲</span> <span style="background-color: green; color: white; padding: 2px 5px;">▼</span> </div>
<b>Description of Assessment</b> Students will inventory locally grown fruit and interview agriculturalists in industry about problems in production and environmental factors associated with fruit spoilage. Students will become a specialist on one commodity and educate others on how the anatomy and development of their commodity makes it more or less susceptible to fruit spoilage.		



## Engaging Learning Experiences

Name of Assessment	Essential Question/Component	Assessment Type
Creating and Mixing Soils Lab	How do plants grow?	Formative
<b>Objective of Assessment</b>	<b>Required Texts/Materials</b>	
Students will design their own soil mix and be able to explain the basics of soil amendments for improving soil.	Class Textbook, Components of Soil and Ammendements	
<b>Skills and/or Concepts Assessed (Standards)</b>		
HS Matter and Energy in Organisms and Ecosystems HS-LS1-5, HS-LS1-6, HS Matter and Energy in Organisms and Ecosystems HS-LS2-3, HS-LS2-5, HS Interdependent Relationships in Ecosystems HS-LS4-6, HS Human Sustainability HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4		<b>Skills/Strategies</b> <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input checked="" type="checkbox"/> Numeracy <input type="checkbox"/> Relevant/Real-World <input type="checkbox"/> Inquiry/Project-Based <input checked="" type="checkbox"/> Integrated/Cross-Curricular
<b>Description of Assessment</b>		
After mixing soil as a class with a recipe, students will identify the needs of their plants for the plant sale and make their own soil mix.		<div style="display: flex; justify-content: space-around; align-items: center;"> <span style="background-color: green; color: white; padding: 2px 5px;">+</span> <span style="background-color: red; color: white; padding: 2px 5px;">-</span> <span style="background-color: green; color: white; padding: 2px 5px;">▲</span> <span style="background-color: red; color: white; padding: 2px 5px;">▼</span> </div>
LRHS Pollution Reduction Project	How do plants grow?	Summative
<b>Objective of Assessment</b>	<b>Required Texts/Materials</b>	
Students will apply knowledge of the growing cycles and processes of plants including; photosynthesis, carbon cycle, water cycle, Nitrogen cycle to analyze pollution. After interviewing innovative agriculturalists and their work to reduce pollution students will identify pollution at LRHS and carry out a plan to reduce it.	Class Textbook	
<b>Skills and/or Concepts Assessed (Standards)</b>		
HS Matter and Energy in Organisms and Ecosystems HS-LS1-5, HS-LS1-6, HS Matter and Energy in Organisms and Ecosystems HS-LS2-3, HS-LS2-5, HS Interdependent Relationships in Ecosystems HS-LS4-6, HS Human Sustainability HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4		<b>Skills/Strategies</b> <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input checked="" type="checkbox"/> Integrated/Cross-Curricular
<b>Description of Assessment</b>		
Students study the pollution map of California and research the role of agriculture on pollution. Students interview an innovative agriculturalists on what the industry is doing to reduce pollution in our local area. Using industry advice and experience, students create and carry out a plan to reduce pollution on our campus.		<div style="display: flex; justify-content: space-around; align-items: center;"> <span style="background-color: green; color: white; padding: 2px 5px;">+</span> <span style="background-color: red; color: white; padding: 2px 5px;">-</span> <span style="background-color: green; color: white; padding: 2px 5px;">▲</span> <span style="background-color: red; color: white; padding: 2px 5px;">▼</span> </div>

Name of Assessment	Essential Question/Component	Assessment Type
Plant Name Lab	How are plants identified?	Formative
<b>Objective of Assessment</b> Students will understand the how and why of plant nomenclature and plant taxonomy. They will explain why scientific names are used, the difference between genus, species, and variety, and list five plants by their common and scientific names.	<b>Required Texts/Materials</b> Class Textbook and Notes, Plants	<b>Skills/Strategies</b> <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Skills and/or Concepts Assessed (Standards)</b> HS Inheritance and Variation of Traits HS-LS1-4		<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>
<b>Description of Assessment</b> Students will collect five different plants on campus and identify their taxonomy and scientific and common name.		
Name and Culture of Native Plants Study	How are plants identified?	Summative
<b>Objective of Assessment</b> Students will understand the how and why of plant nomenclature and plant taxonomy. They will explain why scientific names are used, the difference between genus, species, and variety, and list native five plants by their common and scientific names and their uses.	<b>Required Texts/Materials</b> Class Textbook, Internet	<b>Skills/Strategies</b> <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Skills and/or Concepts Assessed (Standards)</b> HS Inheritance and Variation of Traits HS-LS1-4		<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>
<b>Description of Assessment</b> Project Based Learning: Study a culture of native plants, identify its uses in its native country, and compare/contrast how the name corresponds to its origin and use		



Name of Assessment	Essential Question/Component	Assessment Type
Rooting Hormone vs. Non Rooting Hormone Lab	How are plants propagated sexually and asexually?	Formative
<b>Objective of Assessment</b>	<b>Required Texts/Materials</b>	<b>Skills/Strategies</b>
Students will understand the use of rooting hormone in propagating plants as growth stimulants, or growth inhibitors.	Class Textbook, Lab, Rooting Hormone, Cuttings, Soil, Flats	<u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input type="checkbox"/> 21st Century Skills
<b>Skills and/or Concepts Assessed (Standards)</b>		<u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Description of Assessment</b>		<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>
HS Structure and Function HS-LS1-3 HS Matter and Energy in Organisms and Ecosystems HS-LS1-5 HS Inheritance and Variation of Traits HS-LS1-4		
Students will make cuttings of one plant and in each row of cells dip the plant in a different concentration of rooting hormone with the control being no hormone.		
<b>Name of Assessment</b>	<b>Essential Question/Component</b>	<b>Assessment Type</b>
roject Based Learning: Propagate a flat of houseplants, annuals, perennials, and vines for the plant sale.	How are plants propagated sexually and asexually?	Summative
<b>Objective of Assessment</b>	<b>Required Texts/Materials</b>	<b>Skills/Strategies</b>
Students will demonstrate knowledge of sexual and asexual plant reproduction.	Call Textbook, Seeds, Cuttings, Soil, Flats	<u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills
<b>Skills and/or Concepts Assessed (Standards)</b>		<u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Description of Assessment</b>		<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>
HS Inheritance and Variation of Traits HS-LS1-4, HS Structure and Function HS-LS1-3 HS Matter and Energy in Organisms and Ecosystems HS-LS1-5 HS Interdependent Relationships in Ecosystems HS-LS2-8		
Students will propagate a flat of houseplants, annuals, perennials, and vines for the plant sale.		

Name of Assessment	Essential Question/Component	Assessment Type
Greenhouse Care and Maintenance Procedures	How do you utilize and care for a greenhouse?	Formative
<b>Objective of Assessment</b>  Students will understand cultural practices for growing greenhouse crops as well as tools and equipment within a greenhouse including retractable roof settings for lighting, automatic watering systems, heating, cooling systems (fans, vents, and swamp cooler), germination chamber, and bottom heat.	<b>Required Texts/Materials</b>  Classroom Text, Greenhouse Manual	<b>Skills/Strategies</b>  <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Skills and/or Concepts Assessed (Standards)</b>  Structure and Function HS-LS1-3, Matter and Energy in Organisms and Ecosystems HS-LS1-5, HS Human Sustainability HS-ESS3-2, HS-ESS3-3, HS-ESS3-4  Students will design procedures for annual care for the greenhouse and equipments within the greenhouse.		
<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>		
Name of Assessment	Essential Question/Component	Assessment Type
Greenhouse Care and Maintenance Roles	How do you utilize and care for a greenhouse?	Summative
<b>Objective of Assessment</b>  tudents will understand cultural practices for growing greenhouse crops as well as tools and equipment within a greenhouse including retractable roof settings for lighting, automatic watering systems, heating, cooling systems (fans, vents, and swamp cooler), germination chamber, and bottom heat.	<b>Required Texts/Materials</b>  Classroom Text, Greenhouse Manual	<b>Skills/Strategies</b>  <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Skills and/or Concepts Assessed (Standards)</b>  Structure and Function HS-LS1-3, Matter and Energy in Organisms and Ecosystems HS-LS1-5, HS Human Sustainability HS-ESS3-2, HS-ESS3-3, HS-ESS3-4  Students will select roles to routinely care and maintain the greenhouse and equipment to ensure its effectiveness and efficiency.		
<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>		



Name of Assessment	Essential Question/Component	Assessment Type
Natural Predator Lab	What are the basic principles of weed and pest management and Integrated Pest Management?	Formative
<b>Objective of Assessment</b>  Students will identify pests, research their life cycle, and find a natural predator to eliminate insect harm.	<b>Required Texts/Materials</b>  Classroom Text, Internet, Horticulture Facility	<b>Skills/Strategies</b> <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Skills and/or Concepts Assessed (Standards)</b>  HS Structure and Function HS-LS1-1, HS-LS1-3, HS Interdependent Relationships in Ecosystems HS-LS2-6, HS-LS2-7, HS-LS2-8, HS-LS4-6 Human Sustainability HS-ESS3-2, HS-ESS3-3, HS-ESS3-4		
<b>Description of Assessment</b>  Students will identify pests, research their life cycle, and find a natural predator to eliminate insect harm.		<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>
Integrated Pest Management Plan for the LRHS Greenhouse	What are the basic principles of weed and pest management and Integrated Pest Management?	Summative
<b>Objective of Assessment</b>  Students will be able to identify weeds and pests and create a plan utilizing prevention, natural remedies, natural predators, synthetic and non-synthetic chemicals to treat the LRHS Farm with the least amount of pollution as possible.	<b>Required Texts/Materials</b>  Classroom Text, Internet, Horticulture Facility	<b>Skills/Strategies</b> <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input checked="" type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input checked="" type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
<b>Skills and/or Concepts Assessed (Standards)</b>  HS Structure and Function HS-LS1-1, HS-LS1-3, HS Interdependent Relationships in Ecosystems HS-LS2-6, HS-LS2-7, HS-LS2-8, HS-LS4-6 Human Sustainability HS-ESS3-2, HS-ESS3-3, HS-ESS3-4		
<b>Description of Assessment</b>  Students will create an Integrated Pest Management Plan for the LRHS Farm, greenhouse, and horticulture area.		<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>

Name of Assessment	Essential Question/Component	Assessment Type
Landscape Design and Diagram Project Lab  <b>Objective of Assessment</b>  Students will utilize the elements of design and basic understanding of landscaping planning to design and construct a landscape design.  <b>Skills and/or Concepts Assessed (Standards)</b>  HS Inheritance and Variation of Traits HS-LS1-1, HS-LS1-2, HS-LS1-4 HS Matter and Energy in Organisms and Ecosystems HS-LS1-5, HS-LS1-6, HS-LS2-3, HS-LS2-5, HS Interdependent Relationships in Ecosystems HS-LS4-6, HS Human Sustainability HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4  <b>Description of Assessment</b>  Students will practice knowledge of plant selection and placement using annual and perennial flowers, deciduous shrubs, and trees. Students will demonstrate their knowledge of establishing, maintaining and restoring a lawn through the design, installation, and maintenance of turf plots. Students will demonstrate the five steps in seeding a lawn, the proper use of fertilizer on a lawn, the difference between cool season and warm season grasses, and the step by step approach to renovate a lawn. Students will research the types of irrigation systems and install the most appropriate to properly irrigate and conserve water.	How do you install a landscape including turf grass?  <b>Required Texts/Materials</b>  Class text, horticulture materials, plants	Formative  <b>Skills/Strategies</b>  <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input checked="" type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular



Name of Assessment	Essential Question/Component	Assessment Type
Landscape or Grass Installation for a cause	How do you install a landscape including turf grass?	Summative
<b>Objective of Assessment</b>  Students will utilize the elements of design and basic understanding of landscaping planning to design and construct a landscape design. Students will practice knowledge of plant selection and placement using annual and perennial flowers, deciduous shrubs, and trees. Students will demonstrate their knowledge of establishing, maintaining and restoring a lawn through the design, installation, and maintenance of turf plots. Students will demonstrate the five steps in seeding a lawn, the proper use of fertilizer on a lawn, the difference between cool season and warm season grasses, and the step by step approach to renovate a lawn. Students will research the types of irrigation systems and install the most appropriate to properly irrigate and conserve water.	<b>Required Texts/Materials</b>  Class Textbook, Horticulture Supplies, Plants	<b>Skills/Strategies</b>  <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input checked="" type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular  <div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>
	<b>Skills and/or Concepts Assessed (Standards)</b>  HS Inheritance and Variation of Traits HS-LS1-1, HS-LS1-2, HS-LS1-4 HS Matter and Energy in Organisms and Ecosystems HS-LS1-5, HS-LS1-6, HS-LS2-3, HS-LS2-5, HS Interdependent Relationships in Ecosystems HS-LS4-6, HS Human Sustainability HS-ESS3-1, HS-ESS3-2, HS-ESS3-3, HS-ESS3-4	
<b>Description of Assessment</b>  Students will design and install a landscape in the City of Galt utilizing Liberty Ranch grown plants for a community organization, low-income family, or someone in need or Work with grounds and maintenance at school or in the City of Galt to renovate a designated lawn area on campus or in town		

Name of Assessment	Essential Question/Component	Assessment Type
Project Based Learning: Plant Sale Marketing Plan	How do you market plant crops for sale?	Formative
<b>Objective of Assessment</b> Students will evaluate and critique marketing plans analyzing product, price, place, promotion.	<b>Required Texts/Materials</b> Class Textbook	<b>Skills/Strategies</b> <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input checked="" type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input checked="" type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input checked="" type="checkbox"/> Integrated/Cross-Curricular
<b>Description of Assessment</b> Students will evaluate and critique marketing plans analyzing product, price, place, promotion.		
<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>		
Marketing Plan Critiques	How do you market plant crops for sale?	Summative
<b>Objective of Assessment</b> Students will create a marketing plan that will be used at the plant sale and Farmer's Market sales.	<b>Required Texts/Materials</b> Class Textbook	<b>Skills/Strategies</b> <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input checked="" type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills  <u>Strategies</u> <input checked="" type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input checked="" type="checkbox"/> Inquiry/Project-Based <input checked="" type="checkbox"/> Integrated/Cross-Curricular
<b>Description of Assessment</b> Students will demonstrate the ability to market plant crops by creating a marketing plan for the plant sale which includes a flyer to accompany a specific crop with a determined market price. Students will create a sales display for a specific plant crop, and practice their sales ability during plant sales and farmer's markets.		
<div> <div>+</div> <div>-</div> <div>▲</div> <div>▼</div> </div>		



Name of Assessment		Essential Question/Component		Assessment Type	
Work based learning guest speakers, field trips, mentorships, job shadows reflections and share-outs.		What are the career opportunities in horticulture?		Formative	
<b>Objective of Assessment</b> Students will develop the necessary 21st Century skills for college and career through these activities.		<b>Required Texts/Materials</b>  		<b>Skills/Strategies</b> <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills	
<b>Skills and/or Concepts Assessed (Standards)</b>  		<b>Description of Assessment</b> Students will observe and practice 21st Century Skills by the following activities; guest speakers, field trips, mentorships, and job shadows.		<u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular	
				<input checked="" type="checkbox"/> + <input type="checkbox"/> - <input type="checkbox"/> ▲ <input type="checkbox"/> ▼	
Horticulture Certification		What are the career opportunities in horticulture?		Summative	
<b>Objective of Assessment</b> Students will become certified through California Association of Nurseries and Garden Centers		<b>Required Texts/Materials</b> Certification Invitation, Computer, Internet		<b>Skills/Strategies</b> <u>Skill Sets</u> <input checked="" type="checkbox"/> Literacy <input checked="" type="checkbox"/> Digital Literacy <input checked="" type="checkbox"/> 21st Century Skills	
<b>Skills and/or Concepts Assessed (Standards)</b>  		<b>Description of Assessment</b> Students will receive an industry recognized certification demonstrating mastery of skills in horticulture topics.		<u>Strategies</u> <input type="checkbox"/> Numeracy <input checked="" type="checkbox"/> Relevant/Real-World <input type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular	
				<input checked="" type="checkbox"/> + <input type="checkbox"/> - <input type="checkbox"/> ▲ <input type="checkbox"/> ▼	

Name of Assessment	Essential Question/Component	Assessment Type
		Formative
Objective of Assessment	Required Texts/Materials	<b>Skills/Strategies</b> <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input type="checkbox"/> 21st Century Skills <u>Strategies</u> <input type="checkbox"/> Numeracy <input type="checkbox"/> Relevant/Real-World <input type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
		<input type="checkbox"/> + <input type="checkbox"/> - <input type="checkbox"/> ▲ <input type="checkbox"/> ▼
Name of Assessment	Essential Question/Component	Assessment Type
Objective of Assessment	Required Texts/Materials	<b>Skills/Strategies</b> <u>Skill Sets</u> <input type="checkbox"/> Literacy <input type="checkbox"/> Digital Literacy <input type="checkbox"/> 21st Century Skills <u>Strategies</u> <input type="checkbox"/> Numeracy <input type="checkbox"/> Relevant/Real-World <input type="checkbox"/> Inquiry/Project-Based <input type="checkbox"/> Integrated/Cross-Curricular
		<input type="checkbox"/> + <input type="checkbox"/> - <input type="checkbox"/> ▲ <input type="checkbox"/> ▼



# Attachments and Appendices

List any and all attachments or appendices that will be included with this document, in the order that they will be attached. Some examples of common attachments:

- skill progressions
- rubrics
- lesson plans/handouts for formative and summative performance tasks
- suggested reading/book lists
- pacing guides

Title	Assessment/Unit Associated With	# of Pages
		<div><div>+</div><div>-</div><div>▲</div><div>▼</div></div>

