

Pacing Guide for Environmental Horticulture Arroyo Valley High School

| Unit Name | Instructional Days/Laboratory Days | Assessments |
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| <p>Unit Name: Safety Unit Objective: Safety in the classroom laboratory and in the field will be reviewed. Students will review the course competencies, the expectations both in the classroom and in the field. Unit Competencies: Review teacher/student expectations Review course competencies Identify and discuss the hazards in the classroom lab.</p> | <p>Instructional: 2</p> | <p>Lab Safety Test; classroom and lab procedures</p> |
| <p>Unit Name: Tools and Measurement Unit Objective: Identify the agricultural tools and laboratory equipment that will be used in the class. Identify the equipment that is used in the industrial field. Understand and apply the scientific method. Unit Competencies: Properly identify the correct tool to be used in a particular laboratory or industrial setting. List and apply the scientific method. Recognize and use tools common to the industry. Practice safe operation of all tools and lab equipment. Operate assorted power tools correctly. Understand the importance of keeping tools clean and in good working order.</p> | <p>Instructional: 1 Laboratory: 2</p> | <p>Measurement Lab, Tool identification; tool maintenance log (ongoing)</p> |
| <p>Unit Name: Nature of Life Unit Objective: Students will understand the fundamental concepts of life and how it relates to more advanced organisms such as eukaryotic cells. Unit Competencies: Characteristics of life Relationship between structure and function Chemical and physical bases of plant life Components of the Plant Cell and how it differs from the Animal and Prokaryotic Cells in structure and function</p> | <p>Instructional: 6 Laboratory: 4</p> | <p>Microscope activity of cell types: prokaryotic vs eukaryotic and plant vs animal cells</p> |

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| <p>Unit Name: Agriculture effects on the environment Unit Objective: Recognize and identify the different kinds of natural resources that relate to agriculture. Unit Competencies: Students will be able to trace major elements through the ecosystem: Nitrogen Cycle, Hydrological Cycle, Carbon Cycle, and Oxygen Cycle Chemical erosion and physical properties Describe how agricultural practices benefit and/or harm the environment Compare and contrast organic and conventional practices. Understand how pollution is categorized and trace the source of the pollution Conserving natural and water resources</p> | <p>Instructional: 20 Laboratory: 0</p> | <p>Guest speaker: Air Quality Management District (AQMD); Cross Curricular Resource Conservation project (Science, Ag, History, English)</p> |
| <p>Unit Name: Plants and Civilization Unit Objective: Track the effects of agriculture on civilizations through history. Students will be able to distinguish the different horticulture techniques practiced in different cultures. Unit Competencies: 1. Origin of cultivated plants 2. Selected families of flowering plants 3. Agricultural and urban environment influence 4. Multiculturalism and plants 5. Ethno-botany 6. Pioneers of plants & civilizations</p> | <p>Instructional: 10 Laboratory: 0</p> | <p>Compare and contrast lifestyles of today verses 250 years ago; comparative essay on agriculture in relation to a nation's sustainability</p> |
| <p>Unit Name: Plant Physiology and Growth Unit Objective: Students will understand how different types of plants grow and function. Students will relate the functions and structures of the plant to the ecosystem and/or season the plant flourishes. Unit Competencies: Examination of cell wall and function Photosynthesis/Cellular Respiration Cellular reproduction DNA, RNA, and synthesis of proteins Introduction of root, stem, and leaves Requirements for seed germination Plant hormones Plant pigments Photoperiodism Environmental modifications for growth Managing plant growth</p> | <p>Instructional: 8 Laboratory: 12</p> | <p>Hydroponic lab (ongoing), Central dogma activity, Plant and animal cell identification microscope lab</p> |

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| <p>Unit Name: Plant Reproduction Unit Objective: Students will understand the difference between the different methods of plant reproduction Unit Competencies: Asexual Reproduction Sexual Reproduction</p> | <p>Instructional: 10 Laboratory: 10</p> | <p>Sexual Reproduction: Pollen Observation, fruit propagation techniques</p> |
| <p>Unit Name: Taxonomy Unit Objective: Students will understand the concept of identifying organisms based on physiology, evolution, and morphology and apply it to the agriculture setting to solve problems. Unit Competency:</p> <ol style="list-style-type: none"> 1. Discuss the development of the "kingdom concept". 2. Define the word taxonomy. 3. List three bases by which plants can be classified (morphology, physiology, and evolution). 4. Discuss three reasons for the current use of the modern system of plant classification. (e.g. language barriers, universal name, evolutionary relationships, similarities.) 5. Define genus, species, and variety. 6. Require students to collect ten common species in your area and memorize their generic names. 7. Place the following terms in their correct descending order for plant classification: Kingdom, Division (Phylum), Class, Order, Family, Genus, Species, and Variety. 8. List and discuss three applications the science of taxonomy has for the field of agriculture (e.g. plant, insect, and microorganism identification). | <p>Instructional: 8 Laboratory: 12</p> | <p>Practice Keying plants Common plant identification: ornamental plants, native plants, crop species</p> |

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| <p>Unit Name: Plant Pathology and Entomology Unit Objective: Students will be able to identify different pathogens in the field and how to utilize integrated pest management techniques. Unit Competencies:</p> <ol style="list-style-type: none"> 1. Common diseases 2. Effect on development and growth 3. Method of controls 4. Orders of Insects 5. Insect structure and development 6. Integrated Pest Management (IPM) practices | <p>Instructional: 12 Laboratory: 8</p> | <p>Entomology: Insect and Arachnid comparisons, Beneficial/Harmful insect roles agriculture, Field Trip to farmer that is using IPM on a commercial scale, test plots for IPM techniques; slides of beneficial arthropods</p> |
| <p>Unit Name: Biotechnology Unit Objective: Students will explore how scientific advances are changing agriculture and how the quality of the product is affected. Unit Competencies: Biotechnology Genetically Modified Food Products Hormone Usage Genetic Engineering Food Quality and Nutritional Quality</p> | <p>Instructional: 5 Laboratory: 0</p> | <p>Golden Rice: pros and cons of GMO</p> |
| <p>Unit Name: Soil Structure and Function Unit Objective: Identify different characteristics of plants and how they are formed. Students will be able to apply this and grow plants with different environmental needs. Unit Competencies:</p> <ol style="list-style-type: none"> 1. Components, function, economic uses, and relationship to the earth 2. Geologic Cycle 3. Chemical and physical weathering 4. Soil formation 5. Horticulture soils and planting media | <p>Instructional: 8 Laboratory: 7</p> | <p>Identifying soil types and components (organic vs inorganic); designing soil for special circumstances: containers, self watering, heavy clay, off season, etc.</p> |

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| <p>Unit Name: Plant Nutrients Unit Objective: Nutrient requirements for plants and how they can be more productive by changing certain environmental factors such as planting media and crop rotation. In addition students will be able to spot nutrient deficiencies in different types of plants. Unit Competencies:</p> <ol style="list-style-type: none"> 1. Primary, secondary, and micro-nutrients 2. Function of nutrients in plant growth 3. Nutrient deficiencies & symptoms 4. pH requirements and effects on plant life 5. Nitrogen fixation and absorption 6. Modifying growth | <p>Instructional: 10 Laboratory: 5</p> | <p>Soil pH Testing; Identifying nutrient deficiencies</p> |
| <p>Unit Name: Seed Plants Unit Objective: Distinguish between gymnosperms and angiosperms and explain how humans utilize in the horticulture field. Unit Competencies:</p> <ol style="list-style-type: none"> 1. Human and ecological relevance of gymnosperms 2. Examination of four major divisions of gymnosperms 3. History of gymnosperms 4. Structure and reproduction of flowering plants 5. Plant preservation | <p>Instructional: 4 Laboratory: 6</p> | <p>Identify the different types of gymnosperms and angiosperms;</p> |
| <p>Unit Name: Fruits and Seeds Unit Objective: Students will understand the different parts of seeds and fruits. Unit Competencies:</p> <ol style="list-style-type: none"> 1. Kinds of fruits 2. Fruit and seed dispersal 3. Seed structure 4. Longevity of seeds & fruits | <p>Instructional: 4 Laboratory: 6</p> | <p>Fruit and seed structure and function, germination process in different types of seeds and germination patterns</p> |

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| <p>Unit Name: Growth and maintenance of nursery stock Unit Objective: Unit Competencies: Horticulture structures Evaluation and selecting quality plants Sterilization and Sanitation Mixing Growing Media Planting Sees Watering Nursery Stock Transplanting Planter Types</p> | <p>Instructional: 8 Laboratory: 12</p> | <p>Sanitation Check off sheet (ongoing), plan and propagate seedlings for time schedule (ongoing), xeriscape techniques</p> |
| <p>Unit Name: Professional Opportunities in Environmental Horticulture. Unit Objectives: Explore different opportunities in the industry and present them in an organized fashion via technology (powerpoint, prezi, animoto, etc) Unit Competencies:</p> <ol style="list-style-type: none"> 1. Environmental or Ornamental Horticulture Industry 2. Opportunities and Educational Requirements 3. Horticulture Trade Associations 4. Publications that support the Horticulture Industry | <p>Instructional: 12 Laboratory: 3</p> | <p>Career based exploration project; field trips to local farms; field trips to preserves and national parks</p> |

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| <p>Unit Name: Agriculture Inter-Personal & Leadership Development</p> <p>Unit Objectives: Students will develop a basic understanding of the FFA, recognize the traits of effective leaders and participate in leadership training activities associated with the FFA, which may include public speaking, leading group discussions, working within a committee, conducting business meetings, and problem solving.</p> <p>Unit Competencies:</p> <ol style="list-style-type: none"> 1. Completion of a Supervised Agriculture Experience Program and data collection 2. Critical thinking and group team building activities 3. Agriculture presentations | <p>Instructional: 15 Laboratory: ongoing</p> | <p>Record Keeping, Presentation (Presi, powerpoint, PechaKucha, Video, etc)</p> |
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