LIVING CLASSROOM

6th Grade Lessons Offered

Revision Date: 08/14/14cc

Lesson Title & Description	Standards	Curriculum Correlation	Lesson Length	Season, Location & Special Requirements	No. of Garden Parents
Garden Animal Biodiversity: Using butterfly nets, magnifiers, and insect boxes, students compare the degree of biodiversity in the school playing field with that of the native plant garden and record their findings.	**Next Generation Science Std:** MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services. **Framework for K-12 Science Education:** Science & Engineering Practices: • Analyzing and Interpreting Data • Constructing Explanations and Designing Solutions • Engaging in Argument from Evidence Disciplinary Core Ideas: • LS2.A: Interdependent Relationships in Ecosystems • LS2.B: Cycle of Matter and Energy Transfer in Ecosystems • LS2.C: Ecosystem Dynamics, Functioning, and Resilience Crosscutting Concepts: • Patterns • Cause and Effect • Stability and Change • Scientific Knowledge Assumes an Order and Consistence in Natural Systems	Prentice Hall, Focus on Earth Science, California Edition Chapter 18	45-60 Minutes (Longer session preferred but can fit into a shorter science rotation)	**Fall:** **Date-Range:** From: 9/9/2014 Through: 11/21/2014 Indoor introduction then Outdoor This lesson works best early in the Fall when flowers are blooming and plants are the most attractive to insects.	1 Garden Parent Needed

Nitrogen Cycle: Students learn about nitrogen fixing plants and their importance in nature and for agriculture, examine bacteria nodules on the roots of legumes to learn how nitrogen from the air is fixed into the soil, and examine evidence about the mutually beneficial interaction between Rhizobium bacteria and legumes. In the Fall, students or Living Classroom staff plant fava bean seeds so that the plants are ready for students to harvest in the spring. In the Spring, students learn about the nitrogen cycle and then harvest the fava beans to examine nitrogen-fixing nodules on the roots of the plants.	**Next Generation Science Standards:** MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. **Framework for K-12 Science Education:** Science & Engineering Practices • Developing and Using Models • Analyzing and Interpreting Data Disciplinary Core Ideas • PS1.A: Structure and Properties of Matter • PS1.B: Chemical Reactions • LS1.A: Structure and Function • LS2.A: Interdependent Relationships in Ecosystems • LS2.B: Cycle of Matter and Energy Transfer in Ecosystems Crosscutting Concepts • Cause and Effect • Systems and System Models • Structure and Function	Prentice Hall, Focus on Earth Science, California Edition Chapter 18	45-50 Minutes: 10 minute introduction, 30 minutes with class breaking up into three groups outside to examine nitrogen nodules, and 5 minute conclusion	***Winter*** ***Date-Range:*** From: 1/6/2015 Through: 3/27/2015 Partly dependent on weather and when fava beans are ready for harvest Indoors & Outdoors **Requirement:** This is a harvesting lesson. Students or Living Classroom staff will plant fava beans in the Fall for students to harvest in the Spring.	1 Garden Parent

Planting in Circles: Students are introduced to the radius, diameter, and circumference of circles by planting concentric circular beds in the garden, investigating circles in fruit, constructing circles using a compass, and by looking at tree rings.	**Common Core State Standard in Mathematics:** 6.G.6 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	Correlates with 6th & 7th Grade Math curriculum	70 Minutes	***Winter:*** ***Date-Range:*** From: 2/3/2015 Through: 3/27/2015 Partly dependent on weather Indoors & Outdoors	2 Garden Parents
Ancient Civilizations—How Plants Shaped History: Students will gain a deeper understanding of the role that plants played in establishing Ancient Civilizations as they gather seeds from last year's harvest and then plant the seeds from some of the plants that helped found civilizations in Mesopotamia, Ancient Egypt, India, China, Greece and Rome. They will also taste and examine some of the foods and herbs that were so important to these cultures. The geography and history of the Ancient World are explored using a large map with representative foods from each region. Students work together in small groups to become "experts" on an assigned region and then present their region to their classmates.	**World History and Geography: Ancient Civilizations.** 6.2 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of Mesopotamia, Egypt, and Kush. 6.4 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of Ancient Greece. 6.5 Students analyze the geographic, political, economic, religious, and social structures of the early civilizations of India 6.7 Students analyze the geographic, political, economic, religious, and social structures of the development of Rome.	Correlates with 6th Grade Social Studies curriculum	**One session for Spring:** 45-60 minute session with class divided into three rotations.	***Spring:*** ***Date-Range:*** From: 3/31/2015 Through: 6/5/2015 Indoor and Outdoor Requires a planting space—either one or two raised planter beds and/or a few garden plots. Living Classroom staff can prepare planting area.	2 Garden Parents Needed

California Biodiversity Students learn about a plant community as an element of California's biodiversity, do research as homework, and answer questions about five plant communities after listening to brief presentations in the garden by their classmates.	**Next Generation Science Std:** MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. Ms-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. MS-LS2-4. Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services. **Framework for K-12 Science Education:** **Science & Engineering Practices:** • Analyzing and Interpreting Data • Constructing Explanations and Designing Solutions • Engaging in Argument from Evidence **Disciplinary Core Ideas:** • LS2.A: Interdependent Relationships in Ecosystems • LS2.B: • LS2.C: Ecosystem Dynamics, Functioning, and Resilience Crosscutting Concepts: Stability and Change	Prentice Hall, Focus on Earth Science, California Edition, Chapter 18	2 sessions in the same week, Fall or Spring 45+ minutes per session or more if available.	Fall or Spring. Lesson #1 is both inside and outside in the native garden with two rotations. Lesson #2 is entirely outside in the native garden. A homework assignment between lesson #1 and #2 is required.	2 docents and one garden parent for session #1; One docent and one garden parent for session #2