

LS-HHMI Outreach Curriculum Project Information			
<b>Title</b>	Powerpoint on biodiversity overview (RICHARDPPTBIODIV.ppt) Student debate on monoculture vs. organic farming (RICHARDPLANTDEBATE.doc)		
<b>Resource Type</b>	Lesson Plan X Classroom Activity X Laboratory Activity <input type="checkbox"/> Homework Assignment <input type="checkbox"/> Bioinformatics <input type="checkbox"/> Other <input type="checkbox"/> <Specify>		
<b>Description</b>	These lessons introduce the topic of biodiversity and explain its importance. The powerpoint is a starting point for discussion and gives background information on the study of biodiversity, importance of and conservation. The debate lesson helps to increase student awareness on the importance of biodiversity.		
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<b>Author Institution(s)</b>	Newton South High School		
<b>Objective</b>	Students will be able to describe biodiversity, state its importance to the biosphere and be able to explain how to measure biodiversity. Students will be able to create an argument for or against monoculture in its relation to maintaining biodiversity/		
<b>Key Concepts</b>	Biodiversity (Definition, importance, measurement) Conservation of biodiversity through agricultural practices		
<b>Student Prep</b>	Basic understanding of organisms as a living thing. Cells and how they work.		
<b>Materials</b>	Powerpoint: Computer to show powerpoint Debate: none		
<b>Grade and Level(s)</b>	High School Intermediate and Beginner level of Biology		
<b>Teacher Prep Time</b>	Debate: 1 day	<b>Class Time</b>	4-5 periods
<b>National Standards</b>	<b>Content Standard C - Life Science</b> Biological Evolution Interdependence of organisms Matter, energy and organization in living systems Behavior of organisms <b>Content Standard F - Science in Personal and Social Perspectives</b> Population Growth Natural Resources Environmental Quality Natural and human induced hazards Science and technology in local, national and global challenges		
<b>State Standards</b>	<b>Massachusetts Frameworks</b> <b>Evolution and Biodiversity</b> <b>5.2</b> Describe species as reproductively distinct groups of organisms. Recognize that species are further classified into a hierarchical taxonomic system (kingdom, phylum, class, order, family, genus, species) based on morphological, behavioral, and molecular similarities. Describe the <b>role that geographic isolation can play in speciation.</b> <b>5.3</b> Explain how evolution through natural selection can result in changes in biodiversity through the increase or decrease of genetic diversity within a population.		
<b>Sources</b>	<b>Definition of biodiversity on Wikipedia</b> <a href="http://en.wikipedia.org/wiki/Biodiversity">http://en.wikipedia.org/wiki/Biodiversity</a>		

	<p><b>Extinct Animals that have been photographed alive</b>  <a href="http://www.bspcn.com/2009/04/03/11-extinct-animals-that-have-been-photographed-alive">http://www.bspcn.com/2009/04/03/11-extinct-animals-that-have-been-photographed-alive</a></p> <p><b>IUCN biodiversity threats</b>  <a href="http://www.conservationmeasures.org/initiatives/threats-actions-taxonomies/threats-taxonomy">http://www.conservationmeasures.org/initiatives/threats-actions-taxonomies/threats-taxonomy</a></p> <p><b>MSNBC – Species Disappearing at an Alarming Rate</b>  <a href="http://www.msnbc.msn.com/id/6502368/">http://www.msnbc.msn.com/id/6502368/</a></p> <p><b>PBS: The Botany of Desire m- Debate on Monoculture vs. Organic Farming</b>  <a href="http://www.pbs.org/thebotanyofdesire/lesson-plan-control.php">http://www.pbs.org/thebotanyofdesire/lesson-plan-control.php</a></p> <p><b>University of Idaho-Lessons on Biodiversity/measurement</b>  <a href="http://www.cnr.uidaho.edu/veg_measure/Modules/Lessons/Module%207/7_2_Biodiversity.htm">http://www.cnr.uidaho.edu/veg_measure/Modules/Lessons/Module%207/7_2_Biodiversity.htm</a></p>
<p><b>References</b></p>	<p>Funus Diversity (slide 2)  <a href="http://en.wikipedia.org/wiki/File:Fungi_of_Saskatchewan.JPG">http://en.wikipedia.org/wiki/File:Fungi_of_Saskatchewan.JPG</a></p> <p>Coral Reef Diversity (slide 3)  <a href="http://en.wikipedia.org/wiki/File:Blue_Linekia_Starfish.JPG">http://en.wikipedia.org/wiki/File:Blue_Linekia_Starfish.JPG</a></p> <p>Fruits from the Amazon canopy (slide 4)  <a href="http://en.wikipedia.org/wiki/File:Forest_fruits_from_Barro_Colorado.png">http://en.wikipedia.org/wiki/File:Forest_fruits_from_Barro_Colorado.png</a></p> <p>Organic Farm (Slide 8)  <a href="http://en.wikipedia.org/wiki/File:Julieagroecosystem.jpg">http://en.wikipedia.org/wiki/File:Julieagroecosystem.jpg</a></p> <p>Rosy Periwinkle (Slide 8)  <a href="http://en.wikipedia.org/wiki/File:Rosy_periwinkle.jpg">http://en.wikipedia.org/wiki/File:Rosy_periwinkle.jpg</a></p> <p>Textiles (Slide 9)  <a href="http://commons.wikimedia.org/wiki/File:Karachi_-_Pakistan-market.jpg">http://commons.wikimedia.org/wiki/File:Karachi_-_Pakistan-market.jpg</a></p> <p>Forestry (Slide 9)  <a href="http://commons.wikimedia.org/wiki/File:Skovarbejder.jpg">http://commons.wikimedia.org/wiki/File:Skovarbejder.jpg</a></p> <p>Kayak (Slide 9)  <a href="http://commons.wikimedia.org/wiki/File:River_Teign,_kayaker_in_the_distance.jpg">http://commons.wikimedia.org/wiki/File:River_Teign,_kayaker_in_the_distance.jpg</a></p> <p>Softleaf Indian Paintbrush (Slide 10)  <a href="http://commons.wikimedia.org/wiki/File:Castillejamollis.JPG">http://commons.wikimedia.org/wiki/File:Castillejamollis.JPG</a></p> <p>Chocolate Lily (Slide 10)  <a href="http://commons.wikimedia.org/wiki/File:Fritillaria_biflora2353293201.jpg">http://commons.wikimedia.org/wiki/File:Fritillaria_biflora2353293201.jpg</a></p> <p>Biodiversity Distribution (Slide 11)  <a href="http://commons.wikimedia.org/wiki/File:Biodiversity_Hotspots.svg">http://commons.wikimedia.org/wiki/File:Biodiversity_Hotspots.svg</a></p> <p>Olm (Slide 12)  <a href="http://en.wikipedia.org/wiki/File:P_anguinus-head.jpg">http://en.wikipedia.org/wiki/File:P_anguinus-head.jpg</a></p> <p>Cave Bacteria (Slide 12)  <a href="http://commons.wikimedia.org/wiki/File:Snottite.jpg">http://commons.wikimedia.org/wiki/File:Snottite.jpg</a></p> <p>Current vs. Yet to be discovered species (Slide 13)  <a href="http://en.wikipedia.org/wiki/File:Undiscovered_species_chart.png">http://en.wikipedia.org/wiki/File:Undiscovered_species_chart.png</a></p> <p>Great Aletsch Glacier in Switzerland showing a retreat of the ice (slide 15)  <a href="http://en.wikipedia.org/wiki/File:Gletscherschmelze.jpg">http://en.wikipedia.org/wiki/File:Gletscherschmelze.jpg</a></p> <p>Old Growth vs. New Growth (Slide 16)  <a href="http://commons.wikimedia.org/wiki/File:Old_Growth_vs_Second_Growth.jpg">http://commons.wikimedia.org/wiki/File:Old_Growth_vs_Second_Growth.jpg</a></p> <p>Golden Toad (Slide 17)  <a href="http://commons.wikimedia.org/wiki/File:Bufo_periglenes1.jpg">http://commons.wikimedia.org/wiki/File:Bufo_periglenes1.jpg</a></p> <p>Pyrenean Ibex (Slide 17)  <a href="http://en.wikipedia.org/wiki/File:Spanish_ibex.jpg">http://en.wikipedia.org/wiki/File:Spanish_ibex.jpg</a></p> <p>Baiji Dolphin (Slide 17)  <a href="http://species.wikimedia.org/wiki/Lipotes_vexillifer">http://species.wikimedia.org/wiki/Lipotes_vexillifer</a></p>

**Assessment**

Debate: rubric, reading quizzes  
Test on biodiversity unit