

LS-HHMI Outreach Curriculum Project Information			
<b>Title</b>	Variation, Selection and Time: A Recipe for Biodiversity		
<b>Resource Type</b>	Lesson Plan <input type="checkbox"/> Classroom Activity <input checked="" type="checkbox"/> Laboratory Activity <input type="checkbox"/> Homework Assignment <input type="checkbox"/> Bioinformatics <input type="checkbox"/> Other <input type="checkbox"/> <Specify>		
<b>Description</b>	This activity looks at the everyday math of evolution. It is based upon Chapter 2 of <i>The Making of the Fittest: DNA and the Ultimate Forensic Record of Evolution</i> , by Sean Carroll. The activity looks at Variation, Selection and Time as a recipe for biodiversity in discussing examples of evolution in peppered moths and pocket mice. The lesson is intended to be part of the evolution unit taught in a biology class.		
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<b>Author Institution(s)</b>	Whitman-Hanson Regional High School		
<b>Objective</b>	The objective of the lesson is for students to work through the mathematics behind the appearance of a beneficial mutation and its spread throughout a population.		
<b>Key Concepts</b>	Evolution, Variation, Selection, Mutation, Peppered Moth, Pocket Mice, Graphing		
<b>Student Prep</b>	Students would benefit from an introductory discussion of evolutionary concepts from Darwin's theory of natural selection through a discussion of gene frequencies in populations.		
<b>Materials</b>	<p>1. Two-sided handout of the lesson, giving background information, purpose, materials, procedure and discussion questions.</p> <p>2. Two-sided Worksheet (for answering qu3. Key to Worksheet (for teacher use)</p> <p>Students will require: A copy of the lesson – both introduction notes and student worksheet. A computer with internet connection, a calculator and a pen or pencil.</p>		
<b>Grade and Level(s)</b>	Grades 9-12 Introductory Biology classes, AP Biology Classes		
<b>Teacher Prep Time</b>	Teachers should work through the lesson. (45 minutes)	<b>Class Time</b>	1 class period (60 minutes)
<b>National Standards</b>	<b>THE MOLECULAR BASIS OF HEREDITY&amp; BIOLOGICAL EVOLUTION</b> <b>Content Standard B (grades 9-12)</b>		
<b>State Standards</b>	Massachusetts State Science and Technology Engineering Standards: Life Science 3.3 and all of standard 5 Evolution		
<b>Sources</b>	Carroll, Sean B. <i>The Making of the Fittest: DNA and the Ultimate Forensic Record of Evolution</i> . New York, NY: W.W. Norton &, 2006. Print. <a href="http://www.ucmp.berkeley.edu/education/explorations/tours/geotime/index.html">http://www.ucmp.berkeley.edu/education/explorations/tours/geotime/index.html</a> <a href="http://www.hhmi.org/biointeractive/media/pocket_mouse_evolution-lg.mov">http://www.hhmi.org/biointeractive/media/pocket_mouse_evolution-lg.mov</a>		
<b>References</b>	Carroll, Sean B. <i>The Making of the Fittest: DNA and the Ultimate Forensic Record of Evolution</i> . New York, NY: W.W. Norton &, 2006. Print.		

**Assessment**

1. Observe and record active participation by all students
2. Teachers should assess students on the material by scoring student questions on their student worksheet against the provided Teacher Answer Key
3. Prepare quiz to assess the objectives listed above.