

Evolution (Biol 105) - Syllabus Addendum for Prospective Teachers
 Stearns, S. C. & Hoekstra, R. F. (2005). *Evolution. An Introduction* 2nd Edition.
 Oxford University Press

Chapter	Biology/Life Science Subject Matter Requirements	Academic content standards for kindergarten through grade twelve, adopted by the California State Board of Education
Ch 2 - Adaptive evolution	3.1a Explain why natural selection acts on the phenotype rather than the genotype of an organism	<u>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 7a Students know why natural selection acts on the phenotype rather than the genotype of an organism</u>
	3.1b Predict the survival potential of various groups of organisms based on the amount of diversity in their gene pools	<u>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 7b Students know why alleles that are lethal in a homozygous individual may be carried in a heterozygote and thus maintained in a gene pool; 7c Students know new mutations are constantly being generated in a gene pool.; 7d Students know variation within a species increases the likelihood that at least some members of a species will survive under changed environmental conditions.</u>

	3.2b Analyze the effects of evolutionary patterns on the diversity of organisms (e.g., genetic drift, convergent evolution, punctuated equilibrium, patterns of selection)	<i>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 8b Students know a great diversity of species increases the chance that at least some organisms survive major changes in the environment; 8c Students know the effects of genetic drift on the diversity of organisms in a population</i>
Ch 3 – Neutral evolution	3.2b Analyze the effects of evolutionary patterns on the diversity of organisms (e.g., genetic drift, convergent evolution, punctuated equilibrium, patterns of selection)	<i>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 8b Students know a great diversity of species increases the chance that at least some organisms survive major changes in the environment; 8c Students know the effects of genetic drift on the diversity of organisms in a population</i>
Ch 4 - The genetic impact of selection on populations	3.1b Predict the survival potential of various groups of organisms based on the amount of diversity in their gene pools	<i>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 7b Students know why alleles that are lethal in a homozygous individual may be carried in a heterozygote and thus maintained in a gene</i>

		<i>pool; 7c Students know new mutations are constantly being generated in a gene pool.; 7d Students know variation within a species increases the likelihood that at least some members of a species will survive under changed environmental conditions.</i>
	3.2b Analyze the effects of evolutionary patterns on the diversity of organisms (e.g., genetic drift, convergent evolution, punctuated equilibrium, patterns of selection)	<i>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 8b Students know a great diversity of species increases the chance that at least some organisms survive major changes in the environment; 8c Students know the effects of genetic drift on the diversity of organisms in a population</i>
Ch 5 - The origin and maintenance of genetic variation	3.1b Predict the survival potential of various groups of organisms based on the amount of diversity in their gene pools	<i>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 7b Students know why alleles that are lethal in a homozygous individual may be carried in a heterozygote and thus maintained in a gene pool; 7c Students know new mutations are constantly being generated in a gene</i>

		<i>pool.; 7d Students know variation within a species increases the likelihood that at least some members of a species will survive under changed environmental conditions.</i>
Ch 7 – The expression of variation	3.1a Explain why natural selection acts on the phenotype rather than the genotype of an organism	<u>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 7a Students know why natural selection acts on the phenotype rather than the genotype of an organism</u>
Ch 12 - Speciation	3.3a Distinguish between the accommodation of an individual organism to its environment and the gradual adaptation of a lineage of organisms through genetic change	<u>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 6g * Students know how to distinguish between the accommodation of an individual organism to its environment and the gradual adaptation of a lineage of organisms through genetic change</u>
Ch 13- Phylogeny and systematics	3.4b Construct a branching diagram (cladogram) from a variety of data sources illustrating the phylogeny between organisms of currently identified taxonomic groups	<u>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 8g Students know how several independent molecular clocks, calibrated against each other and combined with evidence from the fossil record, can help</u>

		<i>to estimate how long ago various groups of organisms diverged evolutionarily from one another</i>
Ch 15- Key events in evolution	3.4a Explain the theoretical origins of life on Earth	<u><i>Science Content Standards for California Public Schools, Grades 9-12, Biology/Life Sciences: 8f*</i></u> <i>Students know how to use comparative embryology, DNA or protein sequence comparisons, and other independent sources of data to create a branching diagram (cladogram) that shows probable evolutionary relationships</i>