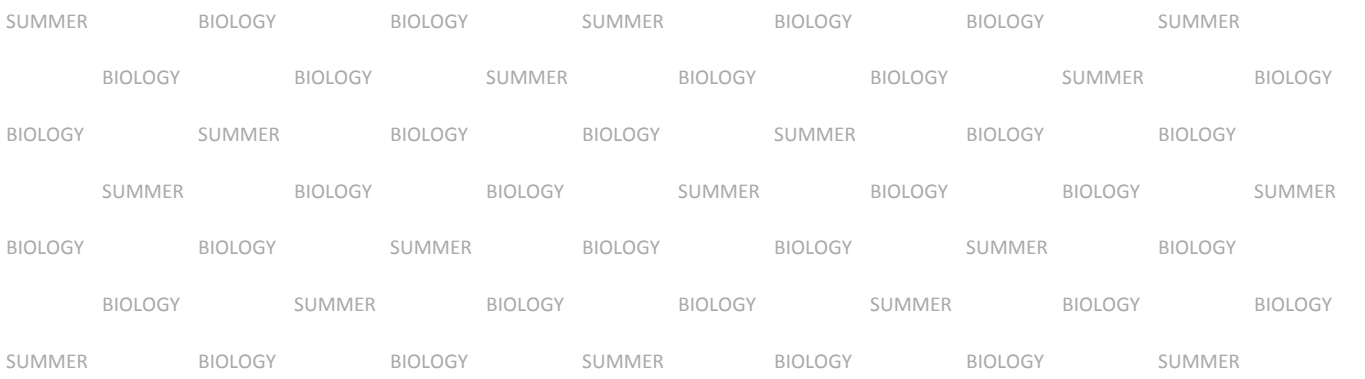
Garden Grove Unified School District
Office of Secondary Education
Department of 7-12 Instructional Services

Summer/Credit Recovery BIOLOGY (Grade 9-12)
FOCUS STANDARDS, PACING, AND BLUEPRINT
Semester 1 (page 1 of 2)

Focus Standards	Suggested # of instructional days*	Textbook Chapters**	# of questions on final exam***
CST emphasis 15% Unit Standard: 1. The fundamental life processes of plants and animals depends on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:			
a. Students know cells are enclosed within semipermeable membranes that regulate their interaction with their surroundings.	3.0	3.3	3
b. Students know enzymes are proteins that catalyze biochemical reactions without altering the reaction equilibrium and the activities of enzymes depend on the temperature, ionic conditions, and the pH of the surroundings.		2.5	4
c. Students know how prokaryotic cells, eukaryotic cells (including those from plants and animals), and viruses differ in complexity and general structure.		3.1-3.2	4
e. Students know the role of the endoplasmic reticulum and Golgi apparatus in the secretion of proteins.		3.2	3
h. Students know most macromolecules (polysaccharides, nucleic acids, proteins, lipids) in cells and organisms are synthesized from a small collection of simple precursors.		2.3	3
CST emphasis 6.7% Unit Standard: 10. Organisms have a variety of mechanisms to combat disease. As a basis for understanding the human immune response:			
a. Students know the role of the skin in providing nonspecific defenses against infection.	2.0	31.1-31.3	3
b. Students know the role of antibodies in the body's response to infection.			3
c. Students know how vaccination protects an individual from infectious diseases.			3
e. Students know why an individual with a compromised immune system (for example, a person with AIDS) may be unable to fight off and survive infections by microorganisms that are usually benign.		31.6	3
d. Students know there are important differences between bacteria and viruses with respect to their requirements for growth and replication, the body's primary defenses against bacterial and viral infections, and effective treatments of these infections.		18	3



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CST emphasis 15% Unit Standard: 1. The fundamental life processes of plants and animals depends on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:			
f. Students know usable energy is captured from sunlight by chloroplasts and is stored through the synthesis of sugar from carbon dioxide.	2.0	4.1-4.3	3
g. Students know the role of the mitochondria in making stored chemical-bond energy available to cells by completing the breakdown of glucose to carbon dioxide.		4.4-4.6	2
CST emphasis 11.7% Unit Standard: 2. Mutation and sexual reproduction lead to genetic variation in a population. As a basis for understanding this concept:			
a. Students know meiosis is an early step in sexual reproduction in which the pairs of chromosomes separate and segregate randomly during cell division to produce gametes containing one chromosome of each type.	2.0	6	2
b. Students know only certain cells in a multicellular organism undergo meiosis.			0
c. Students know how random chromosome segregation explains the probability that a particular allele will be in a gamete.			2
d. Students know new combinations of alleles may be generated in a zygote through the fusion of male and female gametes (fertilization).			3
e. Students know why approximately half of an individual's DNA sequence comes from each parent.			2
f. Students know the role of chromosomes in determining an individual's sex.			2
g. Students know how to predict possible combinations of alleles in a zygote from the genetic makeup of the parents.			3
CST emphasis 5% Unit Standard: 3. A multicellular organism develops from a single zygote, and its phenotype depends on its genotype, which is established at fertilization. As a basis for understanding this concept:			
a. Students know how to predict the probable outcome of phenotypes in a genetic cross from the genotypes of the parents and mode of inheritance (autosomal or X-linked, dominant or recessive).	1.0	7	3
b. Students know the genetic basis for Mendel's laws of segregation and independent assortment.		6	0
CST emphasis 6.7% Unit Standard: 5. The genetic composition of cells can be altered by incorporation of exogenous DNA into the cells. As a basis for understanding this concept:			
a. Students know the general structures and functions of DNA, RNA, and protein.	2.0	8.1-8.3	0
b. Students know how to apply base-pairing rules to explain precise copying of DNA during semiconservative replication and transcription of information from DNA into mRNA.			0

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Summer/Credit Recovery BIOLOGY (Grade 9-12)
FOCUS STANDARDS, PACING, AND BLUEPRINT
Semester 2 (page 1 of 4)

Focus Standards	Suggested # of instructional days*	Textbook Chapters**	# of questions on final exam***
CST emphasis 15% Unit Standard: 1. The fundamental life processes of plants and animals depends on a variety of chemical reactions that occur in specialized areas of the organism's cells. As a basis for understanding this concept:			
d. Students know the central dogma of molecular biology outlines the flow of information from transcription of ribonucleic acid (RNA) in the nucleus to translation of proteins on ribosomes in the cytoplasm.	0.5	8.4	2
CST emphasis 8.3% Unit Standard: 4. Genes are a set of instructions encoded in the DNA sequence of each organism that specify the sequence of amino acids in proteins characteristic of that organism. As a basis for understanding this concept:			
a. Students know the general pathway by which ribosomes synthesize proteins, using tRNAs to translate genetic information in mRNA.	1.5	8.4	2
b. Students know how to apply the genetic coding rules to predict the sequence of amino acids from a sequence of codons in RNA.		8.4	3
c. Students know how mutations in the DNA sequence of a gene may or may not affect the expression of the gene or the sequence of amino acids in an encoded protein.		8.7	2
d. Students know specialization of cells in multicellular organisms is usually due to different patterns of gene expression rather than to differences of the genes themselves.		8.6	0
e. Students know proteins can differ from one another in the number and sequence of amino acids.		8.5	2
CST emphasis 6.7% Unit Standard: 5. The genetic composition of cells can be altered by incorporation of exogenous DNA into the cells. As a basis for understanding this concept:			
c. Students know how genetic engineering (biotechnology) is used to produce novel biomedical and agricultural products.	2	9	2
CST emphasis 6.7% Unit Standard: 7. The frequency of an allele in a gene pool of a population depends on many factors and may be stable or unstable over time. As a basis for understanding this concept:			
a. Students know why natural selection acts on the phenotype rather than the genotype of an organism.	1.5	10 11	2
b. Students know why alleles that are lethal in a homozygous individual may be carried in a heterozygote and thus maintained in a gene pool.			2
c. Students know new mutations are constantly being generated in a gene pool.			0
d. Students know variation within a species increases the likelihood that at least some members of a species will survive under changed environmental conditions.			2

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Academic Year: Summer Session 2009 [Revised 4/09]

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Semester 2 (page 2 of 4)

Focus Standards		Suggested # of instructional days*	Textbook Chapters**	# of questions on final exam***
CST emphasis 8.3%	Unit Standard: 8. Evolution is the result of genetic changes that occur in constantly changing environments. As a basis for understanding this concept:			
a. Students know how natural selection determines the differential survival of groups of organisms.		1.5	10 11	2
b. Students know a great diversity of species increases the chance that at least some organisms survive major changes in the environment.				2
c. Students know the effects of genetic drift on the diversity of organisms in a population.				2
d. Students know reproductive or geographic isolation affects speciation.				1
e. Students know how to analyze fossil evidence with regard to biological diversity, episodic speciation, and mass extinction.				0

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CST emphasis 11.7% — Unit Standard: 6. Stability in an ecosystem is a balance between competing effects. As a basis for understanding this concept:			
a. Students know biodiversity is the sum total of different kinds of organisms and is affected by alterations of habitats.	4.0	13 14 16	3
b. Students know how to analyze changes in an ecosystem resulting from changes in climate, human activity, introduction of nonnative species, or changes in population size.			2
c. Students know how fluctuations in population size in an ecosystem are determined by the relative rates of birth, immigration, emigration, and death.			2
d. Students know how water, carbon, and nitrogen cycle between abiotic resources and organic matter in the ecosystem and how oxygen cycles through photosynthesis and respiration.			3
e. Students know a vital part of an ecosystem is the stability of its producers and decomposers.			2
f. Students know at each link in a food web some energy is stored in newly made structures but much energy is dissipated into the environment as heat. This dissipation may be represented in an energy pyramid.			3
CST emphasis 10% — Unit Standard: 9. As a result of the coordinated structures and functions of organ systems, the internal environment of the human body remains relatively stable (homeostatic) despite changes in the outside environment. As a basis for understanding this concept:			
a. Students know how the complementary activity of major body systems provides cells with oxygen and nutrients and removes toxic waste products such as carbon dioxide.	2.0	28.2, 29.1-29.4, 29.6, 30.1-30.3, 32.2-32.4	3
b. Students know how the nervous system mediates communication between different parts of the body and the body's interactions with the environment.			3
c. Students know how feedback loops in the nervous and endocrine systems regulate conditions in the body.			2
d. Students know the functions of the nervous system and the role of neurons in transmitting electrochemical impulses.			3
e. Students know the roles of sensory neurons, interneurons, and motor neurons in sensation, thought, and response.			3

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Focus Standards	Suggested # of instructional days*	Textbook Chapters**	# of questions on final exam***
CST emphasis 10% — Unit Standard: I & E 1. Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other four strands, students should develop their own questions and perform investigations. Students will:			
a. Select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.	I & E should be included throughout the course of study	I & E standards are embedded throughout the textbook and supporting materials	I & E standards will NOT be directly tested on the Summer School Semester Finals
b. Identify and communicate sources of unavoidable experimental error.			
c. Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.			
d. Formulate explanations by using logic and evidence.			
e. Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.			
f. Distinguish between hypothesis and theory as scientific terms.			
g. Recognize the usefulness and limitations of models and theories as scientific representations of reality.			
h. Read and interpret topographic and geologic maps.			
i. Analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, and succession of species in an ecosystem).			
j. Recognize the issues of statistical variability and the need for controlled tests.			
k. Recognize the cumulative nature of scientific evidence.			
l. Analyze situations and solve problems that require combining and applying concepts from more than one area of science.			
m. Investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include irradiation of food, cloning of animals by somatic cell nuclear transfer, choice of energy sources, and land and water use decisions in California.			
n. Know that when an observation does not agree with an accepted scientific theory, the observation is sometimes mistaken or fraudulent (e.g., the Piltdown Man fossil or unidentified flying objects) and that the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets).			

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