

# BCS Biology

## Pacing Guide

(In Wks.)	CHS	BCHS	RCHS	RHS
<b>Unit 1</b>	4.5	4.5	9	9
<b>Unit 2</b>	4.5	4.5	9	9
<b>Unit 3</b>	4.5	4.5	9	9
<b>Unit 4</b>	4.5	4.5	9	9

Possible Benchmarks: After Units, 1, 2, 3

### Unit 1: Interdependence

<b>LS2-6:</b> Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.	<b>Priority Standard</b>
<b>LS2-7:</b> Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.	<b>Priority Standard</b>
<b>LS2-4:</b> Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.	<b>Priority Standard</b>
<b>LS4-6:</b> Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.	<b>Supporting Standard</b>

<b>LS2-1:</b> Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales	<b>Supporting Standard</b>
<b>LS2-2:</b> Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.	<b>Supporting Standard</b>
<b>ESS3-3:</b> Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.	<b>Supporting Standard</b>
<b>ESS3-4:</b> Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.	<b>Supporting Standard</b>
<b>ESS2-7:</b> Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems.	<b>Supporting Standard</b>

## Unit 2: Biochemistry & Cells

<b>LS2-5:</b> Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.	<b>Priority Standard</b>
<b>LS1-2:</b> Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.	<b>Priority Standard</b>

<b>LS1-7:</b> Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.[]	<b>Priority Standard</b>
<b>LS1-4:</b> Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.	<b>Priority Standard</b>
<b>LS1-6:</b> Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.	<b>Priority Standard</b>
<b>LS1-3:</b> Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.	<b>Supporting Standard</b>
<b>LS1-5:</b> Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.	<b>Supporting Standard</b>
<b>LS1-7:</b> Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed, resulting in a net transfer of energy.	<b>Supporting Standard</b>
<b>LS2-3:</b> Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions.	<b>Supporting Standard</b>

### Unit 3: Inheritance

<b>LS1-1:</b> Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.	<b>Priority Standard</b>

<b>LS3-2:</b> Make and defend a claim based on evidence that inheritable genetic variations may result from (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.	<b>Priority Standard</b>
<b>LS3-3:</b> Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.	<b>Priority Standard</b>
<b>LS3-1:</b> Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.	<b>Supporting Standard</b>

#### **Unit 4: Natural Selection/Evolution**

<b>LS4-4:</b> Construct an explanation based on evidence for how natural selection leads to adaptation of populations.	<b>Priority Standard</b>
<b>LS4-1:</b> Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.	<b>Priority Standard</b>
<b>LS2-8:</b> Evaluate evidence for the role of group behavior on individual and species' chances to survive and reproduce.	<b>Supporting Standard</b>
<b>LS4-3:</b> Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.	<b>Supporting Standard</b>
<b>LS4-5:</b> Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of	<b>Supporting Standard</b>

other species.	
<b>LS4-2:</b> Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.	<b>Supporting Standard</b>