

ASSESSMENT CRITERIA
COLLEGE SCIENCE SKILLS

SCIENCE SKILL	HIGH SCHOOL LEVEL	COLLEGE LEVEL
<i>Science Skill 1</i> Explain Biological Concepts	<ul style="list-style-type: none"> Summarize biological theories and concepts. Compare biological processes. 	<ul style="list-style-type: none"> Explain biological theories and concepts in applied contexts. Relate processes across the molecular, cellular, physiological, population, and ecosystem levels.
<i>Science Skill 2</i> Construct and Analyze Models	<ul style="list-style-type: none"> Interpret diagrams graphs, equations, physical representations, flow charts, and summaries. Summarize key ideas and relationships depicted in a model. 	<ul style="list-style-type: none"> Refine a model to better represent a data set. Construct your own model. Evaluate the benefits and shortcomings of a model.
<i>Science Skill 3</i> Ask Questions and Test Hypotheses	<ul style="list-style-type: none"> Pose testable cause-and-effect questions. Construct predictive experimental hypotheses. Design controlled experiments. Identify independent and dependent variables and control and experimental groups. Control for extraneous variables. Select an appropriate sample size for an investigation. 	<ul style="list-style-type: none"> Pose questions that connect outside knowledge to experimental situations, data sets, and models. Pose ethical questions related to biological phenomena. Construct null hypotheses and multiple competing alternative hypotheses. Design investigations to yield quantitative data that are appropriate for statistical analysis. Justify the selection of positive or negative controls. Evaluate the impact of inherent experimental errors. Select an appropriate model organism for an investigation.
<i>Science Skill 4</i> Represent and Describe Data	<ul style="list-style-type: none"> Construct tables and graphs to display data. Summarize trends from a graph or table. Describe the relationship between two variables. 	<ul style="list-style-type: none"> Select and justify the appropriate type of graph for a data set. Construct and justify the use of logarithmic and dual-Y scales. Summarize trends from non-traditional displays of data.
<i>Science Skill 5</i> Apply Mathematics and Analyze Data	<ul style="list-style-type: none"> Calculate means, medians, modes, and percentages. Solve problems using equations. Use data to evaluate a hypothesis. 	<ul style="list-style-type: none"> Calculate and estimate rates and ratios. Construct and interpret error bars representing confidence intervals. Perform and interpret a chi-square test. Construct your own summary equation. Evaluate the assumptions and shortcomings of an equation. Justify the decision to reject or fail to reject a null hypothesis and to support or refute an alternative hypothesis.

SKILL	HIGH SCHOOL LEVEL	COLLEGE LEVEL
<i>Science Skill 6</i> Develop and Justify Scientific Arguments	<ul style="list-style-type: none"> • State claims based on biological theories. • Compare data from a group of interest to a control group. • Predict the causes and effects of a change in a biological system. 	<ul style="list-style-type: none"> • State claims that connects the underlying biology to complex cellular or ecological phenomena. • Cull specific useful data points of interest from large data sets and exclude extraneous information. • Provide clear and concise reasoning to justify how the evidence supports a claim. • Evaluate biological claims and explanations.

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COLLEGE WORK HABITS

WORK HABIT	HIGH SCHOOL LEVEL	COLLEGE LEVEL
Document Research	<ul style="list-style-type: none"> • Describe the methods and findings of a research investigation. • Connect your findings to larger unsettled biological questions and claims. • Cite sources of information that inform an investigation. 	<ul style="list-style-type: none"> • Maintain a professionally-formatted laboratory notebook. • Present original research orally and through professionally-formatted written laboratory reports and scientific poster boards. • Reference peer-review journal articles using correctly-formatted APA parenthetical citations and a references section.
Solve Problems Collaboratively	<ul style="list-style-type: none"> • Share new ideas and possible solutions with peers. • Listen and respond to peer contributions. 	<ul style="list-style-type: none"> • Reconcile competing explanations. • Share positive feedback on and suggestions for refining peer work. • Ensure that all members of the work group felt listened to, supported, and appreciated.
Contribute to Community Discussion	<ul style="list-style-type: none"> • Loudly and clearly respond to whole-class peer and instructor questions. • Pose specific questions to request clarification on and satisfy curiosity around relevant concepts. 	<ul style="list-style-type: none"> • Volunteer participation in whole-class discussion every class meeting. • Share thoughts on whole-class questions while still grappling with the underlying concepts. • Respond to the contributions of other participants in the class discussion.
Self-Direct Learning and Assessment	<ul style="list-style-type: none"> • Complete all assigned work on time. • Direct continuous, undivided attention towards learning during class. 	<ul style="list-style-type: none"> • Self-assess areas for improvement and celebration. • Regularly practice explaining and applying skills and concepts on your own using a variety of challenging questions and tasks.

Before enrolling in AP Biology, you are expected to be able to perform all these skills at the high school level. Upon completion of the course, you should be able to perform all skills at the college level.