

ASSESSMENT CRITERIA

Skill 1. Describe and explain biological concepts, theories, structures, and processes.

Insufficient Evidence	Basic	Intermediate	Advanced
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<ul style="list-style-type: none">• Summarize biological concepts, theories, structures, and processes.• Compare biological concepts, theories, structures, and processes.• Apply biological concepts and theories to new situations.• Explain the relationships between different parts of a complex structure or process.			


Skill 2. Develop and use biological models.


Insufficient Evidence	Basic	Intermediate	Advanced
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<ul style="list-style-type: none">• Construct and interpret diagrams, flow charts, equations, and other representations.• Explain the relationships between different parts represented within a model.• Refine a model to better represent a concept or data set.• Compare different models representing similar concepts.• Evaluate the benefits and shortcomings of a model.			


Skill 3. Design experiments and conduct research using appropriate laboratory techniques and equipment.


Insufficient Evidence	Basic	Intermediate	Advanced
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<ul style="list-style-type: none">• Pose informed testable questions and ethical questions.• Construct null hypotheses and multiple competing alternative hypotheses.• Design scientifically valid investigations to yield quantitative data that are appropriate for statistical analyses.• Justify the selection of positive or negative controls and other experimental decisions.• Use appropriate terminology to describe variables and groups.• Use appropriate laboratory techniques, equipment, and safety protocols.• Evaluate the potential for experimental errors.			

ASSESSMENT CRITERIA

<i>Skill 4. Graph and analyze data to determine meaningful patterns.</i>			
Insufficient Evidence	Basic	Intermediate	Advanced
			
<ul style="list-style-type: none"> • Construct appropriate tables and graphs. • Select and justify the appropriate type of graph for a data set. • Describe the relationship between variables. 			

<i>Skill 5. Apply mathematics and statistics to solve biology problems.</i>			
Insufficient Evidence	Basic	Intermediate	Advanced
			
<ul style="list-style-type: none"> • Calculate and estimate mean, median, mode, percentages, rates, and ratios. • Solve problems using formulas and equations. • Construct and interpret error bars representing confidence intervals. • Perform and interpret a chi-square test. • Estimate whether a calculated answer is reasonable. • Explain how mathematical representations relate to biological models or theories. 			

<i>Skill 6. Use evidence to support or refute biological claims.</i>			
Insufficient Evidence	Basic	Intermediate	Advanced
			
<ul style="list-style-type: none"> • Make biological claims based on evidence. • Explain how evidence supports or contradicts a claim. • Describe the appropriate data comparison needed to reach a valid conclusion. • Predict the causes and effects of a change in a cell, organism, or ecosystem. 			

How to assess mastery level of these skills			
Insufficient Evidence	Basic	Intermediate	Advanced
			
<i>Need more evidence of proficiency in the skill.</i>	<i>Work achieves some advanced criteria with major errors or achieves all criteria with significant assistance.</i>	<i>Work mostly achieves advanced criteria, but with some conceptual or procedural errors.</i>	<i>Work fully and consistently meets all criteria in this column.</i>

WORK HABIT SELF-ASSESSMENT RUBRIC

Skill 7. Communicate and collaborate with members of a laboratory team.

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| <ul style="list-style-type: none">• Not share ideas or solutions.• Not acknowledge peer contributions.• Not provide feedback on peer work.• Not consider feelings of others. | <ul style="list-style-type: none">• Share new ideas and possible solutions.• Listen and respond to peer contributions.• Share positive feedback on and suggestions for refining peer work.• Ensure that all members of the group feel listened to, supported, and appreciated. |
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Skill 8. Use course resources to self-direct learning and assess areas for improvement and for celebration.

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| <ul style="list-style-type: none">• Regularly miss class, arrive late, or spent time on phone or with hall pass.• Not complete assigned work.• Wait for others to point out areas for improvement and for celebration.• Not practice with concepts or skills outside of class.• Not seek feedback nor learn from mistakes. | <ul style="list-style-type: none">• Regularly attend class on time and spend most of class focused.• Complete all assigned work on time.• Self-assess areas for improvement and for celebration.• Regularly practice explaining concepts and applying skills outside of class.• Seek opportunities for feedback from peers and instructor, and learn from mistakes. |
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