

Grade 10 Science Performance Level Descriptors

Advanced: Students demonstrate superior performance on challenging subject matter. In addition to demonstrating a broad and in-depth understanding and application of all skills at the Proficient level, students scoring at the **Advanced** level typically develop and use models to interpret and evaluate components and relationships among components within and between complex systems and system models related to structure, function, growth and/or development of organisms, organization for matter and energy flow in organisms, cycles of matter and energy transfer in ecosystems, and/or energy in chemistry processes. Students plan and conduct investigations, produce reliable data, considering the types, amounts and accuracy of data needed, analyze and interpret complex data sets to support explanations or claims about the stability related to structure and function of organisms, interdependent relationships in ecosystems at different scales, the cycling of matter and flow of energy among organisms in an ecosystem, the effect variation of traits have in a population, patterns that show evidence of common ancestry and diversity, natural selection, or adaptation. Students ask questions to analyze relationships about how causes of structure and function affect inheritance of traits or support, evaluate, and defend arguments based on evidence as students synthesize and communicate understandings about stability and change in ecosystem dynamics, function and resilience, the cause and effect relationships of social interactions, group behaviors, adaptation, and variation of traits. Students construct, evaluate, or make inferences for an explanation, based on valid and reliable evidence from a variety of sources, of the cause and effect relationships in natural selection, adaptation, and how the structure of DNA determines protein structure and impacts the function of the cell, or evaluate or refine explanations with evidence from a variety of sources for how matter and energy is organized, cycled, and transferred within an organism or ecosystem.

Proficient: Students demonstrate mastery over appropriate grade-level subject matter and readiness for the next grade level. Students scoring at the **Proficient** level typically develop and use models describing components and relationships among components of a system related to structure and function, growth and development of organisms, organization for matter and energy flow in organisms, cycles of matter and energy transfer in ecosystems, and energy in chemistry processes, including hierarchical structures and inputs and outputs of a system. Students can use the models to represent basic aspects of phenomena that result from changes of energy and matter. Students plan and conduct investigations to produce reliable data, analyze and interpret provided data to support explanations or claims about the stability related to structure and function of organisms, interdependent relationships in ecosystems at different scales, the cycling of matter and flow of energy among organisms in an ecosystem, effect variation of traits have in a population, patterns that show evidence of common ancestry and diversity, natural selection, or adaptation. Students ask questions to clarify relationships about how causes of structure and function affect inheritance of traits or evaluate arguments based on evidence as students synthesize and communicate understandings about stability and change in ecosystem dynamics, function and resilience, the cause and effect relationships of social interactions, group behaviors, adaptation, and variation of traits. Students construct an explanation based on valid and reliable evidence from sources about cause and effect

relationships in natural selection, adaptation, and how the structure of DNA determines protein structure and impacts the function of the cell or construct, and revise explanations from evidence from sources for how matter and energy is organized, cycled, and transferred within an organism or ecosystem.

Limited Knowledge: Students demonstrate partial mastery of the essential knowledge and skills appropriate to their grade level. Students scoring at the **Limited Knowledge** level identify or describe basic components or relationships among components within systems and system models related to structure, function, growth and/or development of organisms, organization for matter and energy flow in organisms, cycles of matter and energy transfer in ecosystems, or energy in chemistry processes. Students conduct investigations to produce data and use provided data to support explanations or claims about the stability related to structure and function of organisms, interdependent relationships in ecosystems at different scales, the cycling of matter and flow of energy among organisms in an ecosystem, effect variation of traits have in a population, patterns that show evidence of common ancestry and diversity, natural selection, or adaptation. Students ask questions to identify relationships about how causes of structure and function affect inheritance of traits or describe arguments based on evidence as students communicate understandings about stability and change in ecosystem dynamics, function and resilience, the cause and effect relationships of social interactions, group behaviors, adaptation, and variation of traits. Students identify and describe basic relationships based on evidence of the cause and effect relationships in natural selection, adaptation, and how the structure of DNA determines protein structure and impacts the function of the cell, or identify and describe explanations from evidence for how matter and energy is organized, cycled, and transferred within an organism or ecosystem.

Unsatisfactory: Students have not performed at least at the Limited Knowledge level. Students scoring at the **Unsatisfactory** level should be given comprehensive science instruction.