APPENDIX 16: PROFICIENCY LEVEL DESCRIPTORS

GRADE 4 SCIENCE

Advanced Level

The student displays a highly developed conceptual understanding by designing simple investigations and incorporating the processes of science; explaining technological, local, and historical connections to science; modeling and explaining the characteristics of matter including the phase changes caused by heating and cooling; providing detailed explanations of past and present organisms and comparing their links to the Alaska environment; explaining and modeling the rock cycle and cycles caused by the changing positions of the Sun and Earth; explaining causes of surface changes on Earth; and explaining and modeling that objects in the universe can be observed and described by their properties, locations, and movements.

Proficient Level

The student demonstrates a basic conceptual understanding by applying the processes of science during simple investigations; demonstrating connections between science and technological, local, and historical perspectives; identifying and comparing the characteristics of matter including phase changes caused by heating and cooling; explaining past and present organisms and their Alaska environment; describing simple processes of the rock cycle and cycles caused by the changing positions of the Sun and Earth; identifying the causes of surface changes on Earth; and recognizing that objects in the universe can be observed and described by their properties, locations, and movements.

Below Proficient Level

The student shows a fundamental understanding by recognizing the processes of science during simple investigations; exploring technological, local, and historical connections to science; describing the characteristics of matter including phase changes caused by heating and cooling; identifying past and present organisms and recognizing how they are linked to their Alaska environment; recognizing weathering as part of the rock cycle; connecting daily cycles to seasonal activities; naming causes of surface changes on Earth; and recognizing that objects in the universe can be observed and described by their properties, locations, and movements.

Far Below Proficient Level

There is a significant need for additional instructional opportunities to achieve the proficient level.

GRADE 8 SCIENCE

Advanced Level

The student displays a highly developed conceptual understanding by applying experimental design processes to investigations; examining scientific inquiry; explaining nature of science concepts; analyzing and evaluating differing scientific explanations and models; explaining and comparing the structure and properties of matter; describing transformations, transfers and conservation of energy; drawing conclusions about the interactions between forces, motion, energy, and matter; explaining the structure, function, behavior, development, life cycles, and diversity of living organisms, their changes over time, and their relationships within environments; describing features of Earth; and interpreting and comparing the geochemical cycles, changes, and interactions between Earth and the solar system.

Proficient Level

The student demonstrates a basic conceptual understanding by incorporating methods of experimental design into investigations; applying scientific inquiry; demonstrating nature of science concepts; analyzing differing scientific explanations and models; differentiating among the structure and properties of matter; identifying transformations, transfers and conservation of energy and describing the interactions between forces, motion, energy, and matter; recognizing the structure, function, behavior, development, life cycles, and diversity of living organisms, their change over time, and changes within environments; identifying features of Earth; and explaining geochemical cycles, changes, and interactions between Earth and the solar system.

Below Proficient Level

The student shows a fundamental understanding by recognizing experimental design processes in an investigation; identifying components of scientific inquiry; describing nature of science concepts; recognizing and describing differing scientific explanations and models; recognizing the structure and properties of matter; recognizing that energy can be transformed, transferred and conserved; recognizing the nature of forces, motion, energy, and matter; identifying the basic biology of living organisms in the environment; recognizing features of Earth; and identifying geochemical cycles, changes, and interactions between Earth and the solar system.

Far Below Proficient Level

There is a significant need for additional instructional opportunities to achieve the proficient level.

GRADE 10 SCIENCE

Advanced Level

The student displays a highly developed conceptual understanding by designing and critiquing scientific investigations for accuracy, precision, and bias; utilizing an understanding of various historical perspectives and scientific advancements to construct scientific models; applying ecological principles and information gained from a variety of sources in developing solutions to future societal issues; modeling interactions between matter and energy; analyzing force vectors to predict the motion of objects; comparing and contrasting the structure and function of organisms; predicting why things may change over time; and modeling and drawing conclusions about Earth, its geochemical cycles, and the theories that describe them.

Proficient Level

The student demonstrates a basic conceptual understanding by designing and conducting controlled investigations; accurately interpreting and analyzing data; describing historical perspectives and scientific advancements; comparing information from a variety of sources; providing possible solutions to problems; identifying and using atomic structure and properties to describe interactions between matter and energy; describing laws of forces and motions; explaining the organization, structure, and function of organisms and how and why they may change over time; describing and explaining the interrelationships between living organisms and nonliving things; and describing and demonstrating Earth's geochemical cycles and the theories that explain Earth's systems.

Below Proficient Level

The student shows a fundamental understanding by incorporating methods of experimental design into investigations; interpreting data; recognizing that scientific inquiry can be used to understand various historical perspectives and scientific advancements; recognizing that understanding information gained from a variety of sources can be used to solve problems; identifying atomic structure and properties; identifying the organization, structure, and function of organisms; describing how and why organisms may change over time; recognizing the interrelationships between living organisms and nonliving things; and recognizing Earth as a dynamic planet with geochemical cycles.

Far Below Proficient Level

There is a significant need for additional instructional opportunities to achieve the proficient level.