Grade 5 Threshold Performance Level Descriptors Physical Science			
DCI	**Level 2**	**Level 3**	**Level 4**
PS1: Matter and Its Interactions	***Students should be able to demonstrate knowledge:***		
	• that matter is made of particles that can be identified by their properties and that weight doesn't change during visible physical changes • that the properties of substances may change when combined, but the total weight will stay the same	• that matter is made of particles with unique, measurable properties that are conserved when changing state • that a change to a substance(s) may or may not result in one or more new substances but the total weight will remain the same	• of distinguishing properties of matter and the relationship between visible and non-visible matter • that the outcome of the combination of one or more substances is predictable based on the properties of the substances
PS2: Motion and Stability: Forces and Interactions	***Students should be able to demonstrate knowledge:***		
	• that objects are acted upon by forces that can cause predictable patterns of motion • that the size of a force, the properties of objects, and the position of the objects relative to one another have an effect on their interaction	• that an object's motion is a product of the net force acting on the object and can therefore cause predictable motion • of how certain relationships among the interactions between objects are interconnected and can explain how the objects ultimately affect each other	• of the relationship between net force and motion of an object in predicting future movement • that the relationships between the interactions and the properties of objects are dependent upon systems in which the objects exist
PS3: Energy	***Students should be able to demonstrate knowledge:***		
	• that differences in the movement of energy can cause objects to move at different speeds • that energy in various forms can be transferred from place to place • that energy is transferred when objects collide • that energy can be converted into forms for practical use	• that energy can move from place to place in different forms with varying levels of magnitude • that effects of transferred energy are observable • of the relationship between the transfer of energy and the change in motion when objects collide • that there is a relationship between energy and its conversion for practical uses	• that predictions can be made regarding the interactions of objects based on the amount of energy the objects possess • of the transformation from one type of energy to other type(s) of energy • that when objects collide, there are predictable outcomes • that stored energy is converted energy from the sun

Grade 5 Threshold Performance Level Descriptors Physical Science			
DCI	**Level 2**	**Level 3**	**Level 4**
PS4:	***Students should be able to demonstrate knowledge:***		
	• that there are similarities and differences in the patterns of waves • that in order for an object to be seen, light must reflect off the object • that information can be transmitted over long distances using communication methods/devices	• that the characteristics of a wave determine the net motion of the wave • that there exists a relationship among the path of light, light reflection, and the visibility of objects • of how different communication methods/devices operate	• of how changing the amount of energy can change the characteristics of a wave • that a change in the path of light or light reflection will cause a change in the visibility of an object • of the advantages of different communication methods/devices and how those devices transmit digitized information over long distances

Grade 5 Threshold Performance Level Descriptors Life Science			
DCI	**Level 2**	**Level 3**	**Level 4**
LS1: From Molecules to Organisms: Structures and Processes	***Students should be able to demonstrate knowledge:***		
	• of the internal or external structures of plants or animals and their functions • that animals or plants reproduce and have life cycles • that both animals and plants take in materials to survive • that animals have sense receptors that they use to guide their actions	• of internal and external structures of plants and animals and how their functions support survival, growth, behavior, or reproduction • that animals and plants reproduce for continued existence and have life cycles that are unique but have some similarities • of the relationship between plants or animals and the materials they take in for specific various functions • that an animal's brain processes information received from specialized sense receptors that they use to guide their actions	• of the variation and function of internal and external structures across the plant and animal kingdoms • of the relationships among the components of life cycles • that animals and plants acquire energy from different sources but use the energy for similar functions • that animals respond to environmental changes using sensory information and stored memories

Grade 5 Threshold Performance Level Descriptors Life Science			
DCI	**Level 2**	**Level 3**	**Level 4**
LS2: Ecosystems: Interactions, Energy, and Dynamics	***Students should be able to demonstrate knowledge:***		
	• that in a food web, all organisms have a role **OR** • of the requirements of a healthy ecosystem • that materials cycle through an environment • that organisms respond to changes in their environment • that living in groups helps animals	• that organisms have different roles in a food web, with a focus on the cycling of materials • that the health and stability of an ecosystem depends on the overall biodiversity and the availability of resources • of how materials cycle through multiple components of an environment • of organisms responding to changes in their environment • that living in specialized groups helps animals depending on the situation	• that the materials that animals consume can be traced through multiple levels of the food web back to plants • that the balance of the flow of matter can be disrupted by changes in the ecosystem • of the impact of change on the cycling of matter in a system • of how changes in an environment affect multiple organisms • that the dynamics of a group can change over time
LS3: Heredity: Inheritance and Variation of Traits	***Students should be able to demonstrate knowledge:***		
	• that traits and characteristics are based on both inheritance and environmental factors • that organisms have variations in traits	• that while there are similarities in traits between siblings, they each have characteristics that are influenced by the environment • that some traits are inherited in a predictable way while others may be influenced by the environment	• that environmental factors affect traits or functions • that patterns in traits are expressed over multiple generations • that traits, whether inherited or influenced by the environment, have some similarities and some differences
LS4: Biological Evolution: Unity and Diversity	***Students should be able to demonstrate knowledge:***		
	• that fossils are evidence of plant and animal life long ago • that variations among organisms help them survive and reproduce • that some organisms can survive in a particular environment while others cannot • that plants and animals are affected by change in their habitat	• that fossils are evidence of varying environments • that certain characteristics are advantageous to the survival of a species • that an environment must meet the needs of an organism for survival • that plants and animals may adapt to changes in their environment	• that fossils are evidence of changing environments over time • that specific variation in a characteristic can influence an organism's survival • that changes in an environment affect an organism's ability to survive • that the effects of habitat change may cause adaptation to occur

Grade 5 Threshold Performance Level Descriptors Earth and Space Science			
DCI	**Level 2**	**Level 3**	**Level 4**
ESS1: Earth's Place in the Universe	***Students should be able to demonstrate knowledge:***		
	• that the Sun is an object in the sky and gives off light • that Earth is a rotating body in relative position to the Sun • that the Earth's rotation affects day and night • that there are observable patterns in Moon phases, shadows, and star patterns • that patterns of rock formation can contain fossils and can change due to earth forces	• that distance affects relative size • of changes in patterns (daylight hours, shadow length, stars, Moon phases) that can be observed during day and night as Earth rotates and orbits around the Sun • that fossil records can help identify rock layer formation because of changes caused by natural processes.	• that relative distance affects brightness • that the Earth's orbit and rotation at different times of day and year, together with the orbit of the Moon and position of the Sun, create patterns that affect how humans view objects from Earth • that a geological history can be determined by examining rock layers and fossil records
ESS2: Earth's Systems	***Students should be able to demonstrate knowledge:***		
	• that Earth's four major systems can interact with each other and that components of the systems can change • that maps can be used to locate Earth's features and processes • that Earth has oceans and areas of freshwater • that weather conditions in different areas change over time • that organisms affect the environment	• of how specific processes change components of Earth's four major systems and, in turn, have an effect on the systems themselves • that maps can be used to determine patterns of Earth's features and processes • of the distribution of water on Earth and its availability and accessibility • that patterns of weather form the basis of climate data • of how organisms affect the environment	• of patterns of processes affecting Earth's four major systems and how changes in those processes will likely affect the components of those systems • that the locations of Earth's features are related to geologic changes • that the water cycle affects the distribution of water on Earth • that climatic patterns can be used to predict future weather conditions of an area • that behavior of organisms in an environment can help predict changes to the physical characteristics of that environment

Grade 5 Threshold Performance Level Descriptors Earth and Space Science			
DCI	**Level 2**	**Level 3**	**Level 4**
ESS3: Earth and Human Activity	***Students should be able to demonstrate knowledge:***		
	• that humans use both renewable and non-renewable resources for fuel and energy and that such use can affect the environment • that humans can identify different types of natural hazards • that humans have different effects on the environment or its resources	• that using fuel from natural sources can be positive and negative in multiple ways • that Earth's processes create unavoidable hazards and that humans have an important role in designing solutions to reduce negative impact • that individuals and communities can protect and reduce the negative effects that human activities can have on the environment	• that humans have to make informed decisions about which natural resources to use by analyzing their risks and benefits • that there are benefits and risks to human-created solutions designed to lessen the impact of natural hazards • that humans have to make informed decisions based on the positive and negative effects of their activities in an effort to protect the Earth

Grade 5 SEP Threshold Performance Level Descriptors			
SEP	**Level 2**	**Level 3**	**Level 4**
Asking Questions and Defining Problems (AQDP):	**Students should be able to:**		
A practice of science is to ask and refine questions that lead to descriptions and explanations of how the natural and designed world works and which can be empirically tested.	• identify or ask relevant questions that are testable and that can show cause and effect relationships in the natural or designed world	• identify or ask relevant questions that can be investigated; describe problems that can be solved, • predict reasonable outcomes; and • clarify and redesign a solution to a problem	• generate questions based on investigations incorporating variables to determine patterns while defining and solving a design problem.
Developing and Using Models (DUM):	**Students should be able to:**		
A practice of both science and engineering is to use and construct models as helpful tools for representing ideas and explanations. These tools include diagrams, drawings, physical replicas, mathematical representations, analogies, and computer simulations.	• describe or use a model to show the relationship among components in a phenomenon	• develop or refine a model to minimize limitations or test cause and effect relationships	• evaluate and revise or develop models to show relationships in cause and effect systems
Planning and Carrying Out Investigations (PACI):	**Students should be able to:**		
Scientists and engineers plan and carry out investigations in the field or laboratory, working collaboratively as well as individually. Their investigations are systematic and require clarifying what counts as data and identifying variables or parameters.	• plan an investigation and collect observational data using appropriate methods or tools that help identify outcomes from changing a variable	• plan or conduct an investigation by evaluating appropriate methods or tools for collecting data while making predictions about a fair test in which variables are controlled	• plan and conduct multiple trials of an investigation to produce data that can be compared to make predictions, to serve as evidence for an explanation of a phenomenon, or to test a design solution
Analyzing and Interpreting Data (AID):	**Students should be able to:**		
Scientific investigations produce data that must be analyzed in order to derive meaning. Because data patterns and trends are not always obvious, scientists use a range of tools—including tabulation, graphical interpretation, visualization, and statistical analysis—to identify the significant features and patterns in the data. Scientists identify sources of error in the investigations and calculate the degree of certainty in the results. Modern technology makes the collection of large data sets much easier, providing secondary sources for analysis.	• organize relevant data to identify similarities or differences and describe how the data can be interpreted to make sense of phenomena	• analyze and represent relevant data describing how the data can be interpreted to make sense of phenomena	• evaluate and analyze data to refine a problem statement or make sense of phenomena

Grade 5 SEPs			
SEP	**Level 2**	**Level 3**	**Level 4**
Using Mathematics and Computational Thinking (UMCT):	**Students should be able to:**		
In both science and engineering, mathematics and computation are fundamental tools for representing physical variables and their relationships. They are used for a range of tasks such as constructing simulations; statistically analyzing data; and recognizing, expressing, and applying quantitative relationships.	• identify ways to organize or analyze qualitative or quantitative data	• collect and organize data to reveal patterns, determining whether qualitative or quantitative data would be more appropriate	• organize complex data sets of qualitative or quantitative data, as determined to be appropriate, for determining relationships and patterns, creating algorithms, or utilizing mathematical representations to support conclusions
Constructing Explanations and Designing Solutions (CEDS):	**Students should be able to:**		
The products of science are explanations and the products of engineering are solutions.	• identify evidence or scientific ideas that support relationships to create solutions to a problem	• construct an explanation using evidence which utilizes scientific ideas to solve problems	• using evidence, evaluate and refine explanations of relationships among variables in determining the strengths and weaknesses of a design
Engaging in Argument from Evidence (EAE):	**Students should be able to:**		
Argumentation is the process by which explanations and solutions are reached.	• identify evidence or compare facts in a claim	• distinguish among facts to construct, support, or evaluate a claim	• make or evaluate a claim using multiple sets of data
Obtaining, Evaluating, and Communicating Information (OECI):	**Students should be able to:**		
Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity.	• compare and summarize information to communicate basic scientific explanations of a phenomenon	• compare and combine information from various sources to communicate scientific explanations in various media	• evaluate scientific information to describe evidence and support future investigations