

Science Grade 3

Standards	Not Proficient Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.	Approaching Proficient Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.	* Proficient Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.	Advanced Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.
Embedded Inquiry	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Technology and Engineering	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
1.0 Cells	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of Cells.	A student at this level uses tools and simple equipment to observe and describe specific plant and body parts.	A student at this level uses tools and simple equipment to observe, describe, and compare the functions of specific plant and body parts.	A student at this level selects and uses tools and simple equipment to observe, describe, compare, and contrast the functions of specific plant and body parts.

2.0 Interdependence	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of Interdependence.	A student at this level interprets representations to categorize things as living or non-living. He/she understands that organisms compete for resources within an environment.	A student at this level uses data, illustrations, and graphic organizers to differentiate between living and non-living things. He/she explores different ways that organisms compete for resources within a particular environment.	A student at this level arranges data into tables and graphic organizers in order to compare and contrast things as living or non-living and can justify conclusions. He/she investigates how organisms in different environments compete for resources.
3.0 Flow of Matter and Energy	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of Flow of Matter and Energy.	A student at this level uses diagrams and charts to determine that plants and animals use food to obtain energy and materials for growth and repair.	A student at this level uses diagrams and charts to describe how plants and animals use food to obtain energy and materials for growth and repair.	A student at this level uses diagrams and charts to compare how plants and animals use food to obtain energy and materials for growth and repair.
4.0 Heredity	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of Heredity.	A student at this level uses tables, charts, and diagrams to identify the life stages through which plants and animals pass. He/she can compare the characteristics of parents and their offspring.	A student at this level uses tables, charts, and diagrams to describe life stages through which plants and animals pass. He/she can identify basic characteristics transmitted from parents to offspring.	A student at this level uses tables, charts, and diagrams to compare life stages through which different plants and animals pass. He/she makes predictions about which characteristics are transmitted from parents to offspring.

<p style="text-align: center;">5.0 Biodiversity and Change</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topics of Biodiversity and Change.</p>	<p>A student at this level identifies characteristics that help an organism to survive in a particular environment. He/she uses data from tables, graphs, drawings, and diagrams to group organisms into thriving, threatened, endangered, or extinct categories.</p>	<p>A student at this level investigates the relationship between an organism's characteristics and its chances for survival in a particular environment. He/she can organize data into appropriate tables, graphs, drawings, and diagrams and apply this information to classify organisms as thriving, threatened, endangered, or extinct. He/she recognizes that new tools and technologies are being invented to monitor the earth's biodiversity levels.</p>	<p>A student at this level compares and contrasts the characteristics of different organisms to predict their chances of survival in a particular environment. He/she analyzes data found in tables, graphs, drawings, and diagrams to predict whether an organism will thrive or become threatened, endangered, or extinct. A student can apply simple new tools and technologies to answer questions about the earth's biodiversity.</p>
<p style="text-align: center;">6.0 The Universe</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of the Universe.</p>	<p>A student at this level can identify the major components of the solar system.</p>	<p>A student at this level identifies and interprets simple patterns found in the solar system. He/she uses tables, graphs, and charts to compare and contrast the components of the solar system.</p>	<p>A student at this level develops a system to classify major components of the solar system based on an analysis of data found in tables, graphs, and charts.</p>

<p style="text-align: center;">7.0 The Earth</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of the Earth.</p>	<p>A student at this level can distinguish natural and human-made objects. He/she can describe the physical properties of different rock samples. A student can identify major landforms and bodies of water. He/she can investigate methods used to conserve or recycle materials.</p>	<p>A student at this level investigates the difference between natural and man-made objects. He/she selects and applies appropriate tools to analyze characteristics of rocks. A student analyzes maps to compare major landforms and bodies of water. He/she identifies appropriate methods to conserve or recycle materials. He/she can identify possible approaches to solve a societal problem.</p>	<p>A student at this level designs an investigation to distinguish between natural and man-made objects. He/she can predict the similarities and differences among rock samples from a chart or data table. A student develops a system to classify major landforms and bodies of water. He/she develops a method to conserve or recycle earth materials.</p>
<p style="text-align: center;">8.0 The Atmosphere</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of the Atmosphere.</p>	<p>A student at this level understands that there are a variety of atmospheric conditions that can be measured. He/she can identify different cloud types and associate them with basic weather conditions.</p>	<p>A student at this level selects and uses appropriate tools to measure and describe various atmospheric conditions. He/she can correlate atmospheric conditions with specific cloud types. He/she recognizes that new tools and technologies are being invented to predict the weather.</p>	<p>A student at this level explains how specific tools are used to gather information about the atmosphere. He/she analyzes cloud formations to make predictions about the weather.</p>
<p style="text-align: center;">9.0 Matter</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of Matter.</p>	<p>A student at this level investigates the physical properties of different types of materials. He/she explores different methods to separate mixtures.</p>	<p>A student at this level investigates the physical properties of different types of materials. He/she can identify appropriate methods to separate different types of mixtures.</p>	<p>A student at this level investigates how the physical properties of different materials change over time and under certain conditions. He/she can evaluate different methods used to separate particular types of mixtures.</p>

<p style="text-align: center;">10.0 Energy</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of Energy.</p>	<p>A student at this level recognizes and can describe different sources of energy. He/she conducts an experiment to investigate how a material conducts heat.</p>	<p>A student at this level uses information in charts, tables, and graphs to classify materials according to how they conduct heat. He/she describes methods used to address a particular energy problem.</p>	<p>A student at this level selects and uses appropriate tools to determine how different materials conduct heat. He/she designs a strategy to address an energy problem and can evaluate its effectiveness.</p>
<p style="text-align: center;">11.0 Motion</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of Motion.</p>	<p>A student at this level can describe how changes in mass can affect balanced forces. He/she uses a variety of materials to produce sounds of different pitch and volume.</p>	<p>A student at this level explores mass and forces to determine how they relate to balanced systems. He/she can give examples of new tools and technologies used to produce sound.</p>	<p>A student at this level uses data found in tables and graphs to describe the relationship between the mass of an object and the amount of force necessary to affect a balanced system. He/she determines what new tools and technologies can be used to modify sound in particular ways.</p>
<p style="text-align: center;">12.0 Forces in Nature</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 3 topic of Forces in Nature.</p>	<p>A student at this level identifies the basic characteristics of magnets and conducts a simple experiment to identify objects and materials that are attracted to magnets.</p>	<p>A student at this level can apply information found in charts and tables to predict which objects and materials will be attracted to magnets.</p>	<p>A student at this level can ask questions, make logical predictions, plan investigations, and record data to discover how magnets attract objects made of different metals.</p>

Science Grade 4

Standards	Not Proficient Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.	Approaching Proficient Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.	* Proficient Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.	Advanced Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.
Embedded Inquiry	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Technology and Engineering	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
1.0 Cells	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of Cells.	A student at this level uses appropriate tools to observe the structure of plant and animal cells. He/she recognizes that tools and technologies are used to enhance the study of cells.	A student at this level uses appropriate tools to compare and contrast structures of plant and animal cells. He/she recognizes the connection between the availability of new tools and technologies and scientific advances in the study of the cell.	A student at this level selects appropriate tools to recognize and describe the differences among various plant and animal cells. He/she explains the connection between specific tools and technologies and scientific advances in the study of the cell.

<p style="text-align: center;">2.0 Interdependence</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of Interdependence.</p>	<p>A student at this level recognizes that environmental changes affect the stability of an ecosystem. He/she recognizes that humans can cause significant changes to the environment.</p>	<p>A student at this level uses data found in charts, tables, and graphs to investigate the effects of environmental changes on the stability of an ecosystem. He/she investigates methods used to address a particular ecological problem caused by humans.</p>	<p>A student at this level poses questions and plans investigations with variables, records, analyzes, and interprets data to study how changes in the environment can affect the stability of an ecosystem. He/she designs, tests, and evaluates a strategy to address a particular ecological problem caused by humans.</p>
<p style="text-align: center;">3.0 Flow of Matter and Energy</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of Flow of Matter and Energy.</p>	<p>A student at this level can determine how different organisms acquire energy.</p>	<p>A student at this level creates a model that demonstrates the energy relationships that exist among different organisms.</p>	<p>A student at this level collects, organizes, and analyzes data to compare and contrast methods used by different organisms to acquire energy.</p>
<p style="text-align: center;">4.0 Heredity</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of Heredity.</p>	<p>A student at this level recognizes that reproduction is necessary for the survival of a species. He/she recognizes the basic difference between complete and incomplete metamorphosis.</p>	<p>A student at this level can explain the relationship between individual reproduction and the continued existence of a species. He/she compares and contrasts the stages of complete and incomplete metamorphosis.</p>	<p>A student at this level applies evidence from models and simulations to determine how reproduction is associated with the continuation of a species. He/she interprets diagrams and illustrations to differentiate between complete and incomplete metamorphosis.</p>

<p>5.0 Biodiversity and Change</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topics of Biodiversity and Change.</p>	<p>A student at this level recognizes that physical and behavioral adaptations enable an organism to survive in a particular environment. He/she can identify the general causes of extinction.</p>	<p>A student at this level uses information from a variety of sources to investigate how particular physical and behavioral adaptations ensure survival within specific environments. He/she uses the Internet to explore how specific environmental changes resulted in the extinction of various plant and animal species.</p>	<p>A student at this level uses simulations to explain how physical and behavioral adaptations ensure survival within particular environments. He/she creates a model that demonstrates how an environmental change can lead to the extinction of a species. He/she compares and contrasts this model with what is already known about extinction.</p>
<p>6.0 The Universe</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of the Universe.</p>	<p>A student at this level can identify the basic phases of the moon.</p>	<p>A student at this level can explain the relationship among the sun, moon, and earth during different lunar phases. He/she describes how different tools, technologies, and inventions help to answer questions about the universe.</p>	<p>A student at this level explains how movements of the sun, moon, and earth result in the lunar phases and solar and lunar eclipses. He/she can match particular questions about the universe with the specific tools and technologies needed to investigate these ideas.</p>
<p>7.0 The Earth</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of the Earth.</p>	<p>A student at this level recognizes that the earth's geological features are changed by erosion and deposition. He/she understands that various earth materials can be used to solve particular human problems and enhance the quality of life.</p>	<p>A student at this level designs a model to demonstrate how erosion and deposition affect the earth's surface. He/she determines how specific earth materials can be used to solve particular human problems that enhance the quality of life.</p>	<p>A student at this level selects appropriate tools and simple equipment to investigate how erosion and deposition affect the earth's geological features. He/she predicts which earth materials can be utilized to solve various human problems.</p>

8.0 The Atmosphere	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of the Atmosphere.	A student at this level uses illustrations and diagrams to recognize the major features of the water cycle. He/she understands the difference between weather and climate.	A student at this level creates a model of the water cycle that illustrates the relationships among its component parts. He/she uses charts and tables to differentiate between weather and climate in a particular location.	A student at this level uses appropriate tools and materials to investigate variables that affect the water cycle. He/she evaluates data from maps, charts, and tables to compare and contrast weather and climate in different locations.
9.0 Matter	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of Matter.	A student at this level selects appropriate tools to measure physical properties such as weight, mass, length, volume, and temperature.	A student at this level selects and uses appropriate tools to investigate physical changes in matter such as weight, mass, length, volume, and temperature.	A student at this level selects and uses appropriate tools and units to investigate variables that cause physical changes in matter.
10.0 Energy	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of Energy.	A student at this level recognizes the differences among heat, radiant, and chemical forms of energy. He/she understands how light travels and that light is influenced by different materials and surfaces.	A student at this level recognizes that tools and technologies can be used to distinguish among heat, radiant, and chemical forms of energy. He/she uses data and illustrations to describe how light travels and is influenced by different materials and surfaces.	A student at this level selects appropriate tools and technologies to explore the features of heat, radiant, and chemical forms of energy. He/she investigates how light travels and is influenced by different materials and surfaces.

<p style="text-align: center;">11.0 Motion</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of Motion.</p>	<p>A student at this level can describe the relationship between the speed of an object and the distance traveled over a period of time. He/she understands that the position of an object is relative to its background or position of other objects.</p>	<p>A student at this level uses appropriate materials and tools, and the proper scientific procedure to investigate the relationship between speed and distance traveled over time. He/she can describe the position of an object relative to its background or other objects.</p>	<p>A student at this level selects and uses appropriate materials and tools, and the proper scientific procedure to investigate the relationship between speed, distance traveled over time, and frictional forces.</p>
<p style="text-align: center;">12.0 Forces in Nature</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 4 topic of Forces in Nature.</p>	<p>A student at this level uses equipment to create a simple circuit. He/she can describe the relationship between magnets and electricity.</p>	<p>A student at this level selects and uses appropriate tools and simple equipment to investigate how electricity moves through a simple circuit. He/she uses information found in illustrations and diagrams to explain the relationship between magnets and electricity.</p>	<p>A student at this level uses simple equipment to investigate variables that affect a simple circuit. He/she asks questions, makes predictions, plans an investigation, and collects and interprets data to interpret the relationship between magnets and electricity.</p>

Science Grade 5

Standards	<p style="text-align: center;">Not Proficient</p> <p>Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.</p>	<p style="text-align: center;">Approaching Proficient</p> <p>Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.</p>	<p style="text-align: center;">* Proficient</p> <p>Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.</p>	<p style="text-align: center;">Advanced</p> <p>Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.</p>
Embedded Inquiry	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Technology and Engineering	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
1.0 Cells	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of Cells.</p>	<p>A student at this level can identify the major parts of plant and animal cells such as the nucleus, cell membrane, cell wall, and cytoplasm.</p>	<p>A student at this level uses appropriate tools to compare and contrast the major structures of plant and animal cells.</p>	<p>A student at this level can select and use appropriate tools to complete an investigation of different cell types. He/she observes different cells to predict the function of basic cell structures.</p>

<p style="text-align: center;">2.0 Interdependence</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of Interdependence.</p>	<p>A student at this level researches information found in illustrations, models, and diagrams to identify different types of nutritional and symbiotic relationships. He/she recognizes that human activities and natural disasters affect the environment. He/she understands that people interpret the same data in different ways.</p>	<p>A student at this level applies their understanding of nutritional and symbiotic relationships to create a model that illustrates these relationships in a particular environment. He/she can identify specific cases in which human activity has reduced or increased the impact of natural disasters and can design a strategy to reduce future impacts of this type. He/she can give an example of how people analyzed the same data but reached different conclusions.</p>	<p>A student at this level investigates the impact of various types of nutritional and symbiotic relationships on relevant plant and animal populations. He/she can evaluate specific instances where human activity increased the impact of a natural disaster and design a strategy to reduce future impacts of this type. He/she can offer a variety of explanations for the same set of data.</p>
<p style="text-align: center;">3.0 Flow of Matter and Energy</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of Flow of Matter and Energy.</p>	<p>A student at this level interprets tables and diagrams to conclude that all living things directly or indirectly rely on energy from the sun.</p>	<p>A student at this level uses appropriate tools, materials, and equipment to gather data which demonstrates that the sun's energy is captured by plants through the process of photosynthesis.</p>	<p>A student at this level selects and uses appropriate tools, materials, and equipment to investigate, collect, and analyze data to differentiate among organisms that obtain their energy directly or indirectly from the sun.</p>

<p style="text-align: center;">4.0 Heredity</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of Heredity.</p>	<p>A student at this level uses information found in illustrations and diagrams to determine that genetic information is transmitted from parent to offspring through reproduction.</p>	<p>A student at this level uses information found in illustrations and diagrams to determine that some characteristics are inherited while others are the result of interactions with the environment. He/she recognizes the connection between the invention of new tools and technologies and scientific advances in genetics.</p>	<p>A student at this level evaluates characteristics of organisms to predict if they are inherited or occur as the result of interactions with the environment. He/she can explain the connection between particular tools and technologies and specific scientific advances in genetics.</p>
<p style="text-align: center;">5.0 Biodiversity and Change</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topics of Biodiversity and Change.</p>	<p>A student at this level understands that fossils provide evidence about organisms and environmental conditions that existed in the past. He/she analyzes data found in tables and diagrams to conclude that animals are grouped according to similarities and differences in their characteristics.</p>	<p>A student at this level describes how fossils can be used to compare organisms and environmental conditions that existed in the past with those that exist today. He/she uses data to make inferences about particular groups to which animals belong.</p>	<p>A student at this level uses appropriate tools and technologies to illustrate how specific fossils demonstrate the connection between organisms and environmental conditions that existed in the past and those that exist today. He/she organizes and interprets data to draw conclusions about the relationships among and within different groups of animals.</p>

<p style="text-align: center;">6.0 The universe</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of the Universe.</p>	<p>A student uses charts, illustrations, and models to identify planet characteristics and star patterns. He/she can describe tools from the past and present used to investigate the universe.</p>	<p>A student at this level uses charts, models, and tables to compare and contrast planets and star patterns. He/she can explain how tools and technologies have been used to develop our understanding of planets and stars.</p>	<p>A student at this level uses charts, models, and diagrams to recognize and describe patterns among the characteristics of planets. He/she can locate and identify specific star patterns. He/she understands how tools and technologies from the past and present contribute to the field of study called astronomy.</p>
<p style="text-align: center;">7.0 The Earth</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of the Earth.</p>	<p>A student at this level can describe major geological events such as earthquakes and volcanoes and describe their affect on the earth. He/she applies data from what is already known and accepted by the scientific community to understand earthquakes and volcanoes.</p>	<p>A student at this level investigates, collects, organizes, and interprets data about major geological events to infer how they have shaped the earth's features. He/she understands that the information which is currently known and accepted by the scientific community is subject to change.</p>	<p>A student at this level can design a simulation to demonstrate how major geological events affect the earth's features. He/she can describe how human understanding of major geological events has changed over time due to the invention of new tools and technologies.</p>

<p style="text-align: center;">8.0 The Atmosphere</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of the Atmosphere.</p>	<p>A student at this level can identify the earth's major landforms and bodies of water. He/she recognizes that land and water affect atmospheric conditions and weather patterns. He/she can use basic tools to collect weather data.</p>	<p>A student at this level can analyze graphs, charts, and diagrams to determine how major landforms and bodies of water affect atmospheric conditions and offer logical explanations for the weather. He/she recognizes that new tools, technologies, and inventions are being developed to extend our knowledge of the atmosphere.</p>	<p>A student at this level analyzes major landforms and bodies of water to determine their specific affect on atmospheric conditions. He/she evaluates data from graphs, charts, and diagrams to predict and draw conclusions about the weather. He/she can describe particular tools and technologies that have been used to extend our scientific understanding of the atmosphere.</p>
<p style="text-align: center;">9.0 Matter</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of Matter.</p>	<p>A student at this level can interpret data about physical and chemical changes that occur in different types of matter. He/she observes and measures the chemical properties of common substances.</p>	<p>A student at this level conducts investigations, records and interprets data about physical changes in different types of matter. He/she uses appropriate tools and simple equipment to observe, compare, and measure the chemical properties of common substances.</p>	<p>A student at this level investigates how different variables affect physical changes in different types of matter. He/she selects and uses appropriate tools and simple equipment to observe, compare, and measure the chemical properties of common substances. He/she synthesizes data from multiple sources to analyze patterns of evidence about various types of matter.</p>

<p style="text-align: center;">10.0 Energy</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of Energy.</p>	<p>A student at this level can describe the transfer of energy through convection, conduction, and radiation. He/she can give examples of potential and kinetic energy.</p>	<p>A student at this level investigates how energy is transferred through convection, conduction, and radiation. He/she can build a model to illustrate the difference between potential and kinetic energy.</p>	<p>A student at this level makes a logical prediction about energy transfer through convection, conduction, and radiation and designs a method to test this prediction. He/she can synthesize and analyze data from multiple sources to explain the difference between potential and kinetic energy.</p>
<p style="text-align: center;">11.0 Motion</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of Motion.</p>	<p>A student at this level manipulate objects and make observations about the relationship between mass, force, and distance traveled.</p>	<p>A student at this level investigates the relationship among mass, force, and distance traveled. He/she can compare and contrast conclusions from multiple investigations to conclude that people may interpret the same results in different ways.</p>	<p>A student at this level designs a model that demonstrates the relationship among mass, force, and distance traveled. He/she designs a strategy to address a particular societal problem related to mass, force, and distance traveled.</p>

12.0 Forces in Nature	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 5 topic of Forces in Nature.	A student at this level can identify forces that act on and between objects in the universe. He/she explores how the shape of an object affects the way it falls to the earth.	A student at this level recognizes that new tools and technologies have increased our scientific understanding of forces that act on and between objects in the universe. He/she designs a model that illustrates the relationship between the shape of an object and how its falls to the earth.	A student at this level evaluates specific tools and technologies that have been used to investigate the forces that act on and between objects in the universe. He/she designs a simple investigation about how the shape of an object affects the way it falls to the earth.
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Science Grade 6

Standards	Not Proficient Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.	Approaching Proficient Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.	* Proficient Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.	Advanced Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.
Embedded Inquiry	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
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<p style="text-align: center;">2.0 Interdependence</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 6 topic of Interdependence.</p>	<p>A student at this level can distinguish among producers, consumers, and decomposers. He/she understands that matter and energy are transferred through the environment. He/she can differentiate between biotic and abiotic factors in the environment and associate organisms with particular biomes. The student identifies the general benefits and negative consequences of certain technologies on environmental systems.</p>	<p>A student at this level can identify the role of producers, consumers, and decomposers in a living community. He/she can describe how matter and energy are transferred through an ecosystem. The student interprets data about interactions between biotic and abiotic factors in environments. He/she uses diagrams and illustrations to describe the interdependence among organisms found in the world's major biomes. He/she can compare the intended benefits with the unintended consequences of a particular technology on a specific environmental system.</p>	<p>A student at this level can evaluate the importance of producers, consumers, and decomposers in a biological community. He/she investigates how matter and energy are transferred through an ecosystem. The student can design a model that illustrates the interaction between biotic and abiotic factors in a particular environment. He/she evaluates the degree of interdependence among organisms found in different major biomes. He/she measures the intended benefits with the unintended consequences of new technologies on an environmental system.</p>

6.0 The Universe

A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 6 topic of the Universe.

A student at this level can gather and organize information about the major components of the universe into charts and tables. He/she can describe the relative position of objects in the solar system. The student understands that the position of the earth, moon, and sun control the length of the day, lunar cycle, and year. He/she understands that the moon produces the tides. He/she understands the general relationship between the seasons and the earth-sun system. The student can describe the difference between lunar and solar eclipses.

A student at this level can interpret data found in charts and tables to describe the major components of the universe. He/she can describe the relative distance of objects in the solar system from the earth. The student can describe how the position of the earth, moon, and sun affect the length of the day, lunar cycle, and year. He/she can create a model to demonstrate how the moon produces tides. He/she can describe the relationship between the seasons and the earth-sun system. The student can describe the causes of lunar and solar eclipses.

A student at this level can explain the fundamental differences among the major components of the universe. He/she can create a model that illustrates the relative distance of objects in the solar system. The student can explain how the relative positions of the earth, moon, and sun interact to control the length of the day, lunar cycle, and year. He/she can apply information about moon phases to make predictions about the tides. He/she can apply information about the earth-sun system to explain the cause of the seasons. The student uses information about the earth, sun, and moon to make predictions about lunar and solar eclipses.

<p style="text-align: center;">8.0 The Atmosphere</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 6 topic of the Atmosphere.</p>	<p>A student at this level can interpret a model that illustrates the relationship among the sun, atmospheric convection, and the wind. The student understands that different ocean currents have unique characteristics. He/she identifies tools and techniques used to gather meteorological data and describe weather conditions.</p>	<p>A student at this level can analyze the results of an investigation to determine how the sun causes atmospheric convections that generate wind. The student uses charts and tables to investigate the relationship between the ocean's water temperature and currents. He/she can build simple tools to gather meteorological data.</p>	<p>A student at this level demonstrates the ability to evaluate an investigation that determines how the sun drives atmospheric convections which produces wind, and predict types of global winds. The student can create a model that illustrates the relationships among currents, ocean temperatures to global climate patterns. He/she can identify, select, and use tools to analyze meteorological data and predict weather conditions.</p>
<p style="text-align: center;">10.0 Energy</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 6 topic of Energy.</p>	<p>A student at this level can identify three different forms of potential energy. The student can give examples of technologies that depend on energy transformations. He/she recognizes the Law of Conservation of Energy and some of its underlying principles.</p>	<p>A student at this level can compare and contrast the three forms of potential energy. The student describes how specific technologies illustrate particular types of energy transformations. He/she can interpret specific examples of situations that demonstrate the Law of Conservation of Energy.</p>	<p>A student at this level designs a model that illustrates the three forms of potential energy. The student evaluates current technologies that illustrate energy transformations in terms of their efficiency. He/she describes the principles that govern the Law of Conservation of Energy and can interpret models that illustrates these principles.</p>

12.0 Forces in Nature	A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 6 topic of Forces in Nature.	A student at this level understands that an electrical current flows through a circuit. He/she knows that not all materials can conduct electricity.	A student at this level can describe how an electrical current flows through a simple circuit. He/she can describe the difference between a conductor and a non-conductor of electricity.	A student at this level can identify factors that control how an electrical current flows through a simple circuit. He/she can design and complete an experiment to determine whether a material is a conductor or non-conductor of electricity.
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Science Grade 7

Standards	<p style="text-align: center;">Not Proficient</p> <p>Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.</p>	<p style="text-align: center;">Approaching Proficient</p> <p>Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.</p>	<p style="text-align: center;">* Proficient</p> <p>Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.</p>	<p style="text-align: center;">Advanced</p> <p>Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.</p>
Embedded Inquiry	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Technology and Engineering	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			

1.0 Cells	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 7 topic of Cells.</p>	<p>A student at this level demonstrates the ability to list the basic structures and functions of plant and animal cellular organelles. A student can describe the different levels of organization within living systems. The student recognizes the basic function of organ systems that contribute to the survival of complex multicellular organisms. He/she recognizes the stages of cell division and can define simple diffusion. The student recognizes some elements of the engineering design cycle associated with the development of adaptive and assistive bioengineered products.</p>	<p>A student at this level demonstrates the ability to observe and describe the structure and function of plant and animal cellular organelles. The student can summarize how different levels of organization are integrated within living systems. The student can describe the overall function of different organ systems and explain how the major organs are essential for survival. He/she interprets an illustration of how cell division maintains the chromosome number of a species. The student can explain how various materials move through simple diffusion. The student recognizes the steps involved in the engineering design process associated with developing adaptive and assistive bioengineered products.</p>	<p>A student at this level can compare and contrast the structure and function of plant and animal cellular organelles. The student can interpret the hierarchy that exists among the different levels of organization found in living systems. The student can describe how the combined interactions of different organ systems enable complex multicellular organisms to survive. He/she can produce and evaluate models that explain the processes of cell division and diffusion. The student proposes engineering design solutions for new adaptive and assistive bioengineered products.</p>

<p style="text-align: center;">3.0 Flow of Matter and Energy</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 7 topics of Flow of Matter and Energy.</p>	<p>A student at this level can list and describe the basic features of photosynthesis and respiration. The student recognizes that oxygen and carbon dioxide cycle through the environment. He/she can identify some benefits and consequences of human activities on the environment.</p>	<p>A student at this level distinguishes between the basic features of photosynthesis and respiration and investigates the exchange of oxygen and carbon dioxide between living things and the environment. He/she can compare the intended benefits with the unintended consequences of how new technologies affect the environment.</p>	<p>A student at this level can compare and contrast photosynthesis and respiration and investigate variables that affect these processes. He/she can predict how human behaviors affect the oxygen and carbon dioxide cycle and evaluate the impact of specific technologies on the environment.</p>
<p style="text-align: center;">4.0 Heredity</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 7 topic of Heredity.</p>	<p>A student at this level can label the basic flower parts and describe sexual reproduction. The student can differentiate between sexual and asexual reproduction. The student can define genes and chromosomes and recognizes that they control inherited features. He/she realizes that biotechnologies emerge in response to social, political, and economic needs.</p>	<p>A student at this level demonstrates an understanding of sexual reproduction in flowering plants and can distinguish between sexual and asexual reproduction. The student can explain the relationships among genes, chromosomes, and inherited traits, and predict the probable characteristics of offspring based on parental traits. He/she can explain how biotechnologies respond to social, political, and economic needs.</p>	<p>A student at this level can explain how sexual reproduction occurs in flowering plants. The student can evaluate the advantages of sexual reproduction over asexual reproduction. The student infers how changes in genes and chromosomes can affect the inherited traits of offspring. He/she can analyze how biotechnologies respond to social, political, and economic needs.</p>

<p style="text-align: center;">7.0 The Earth</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 7 topic of the Earth.</p>	<p>A student at this level recognizes the tools and techniques used to describe the physical properties of minerals. He/she can list some of the stages in the rock cycle. The student identifies the basic characteristics of the earth's layers and major plates. The student recognizes that earthquakes, mountain building, volcanoes, and sea floor spreading are associated with movements of the earth's plates. He/she can provide examples of how human activities and technologies affect the earth's land, oceans, and atmosphere.</p>	<p>A student at this level can apply common tools and techniques to identify the physical properties of minerals. He/she can associate the basic events that occur during the rock cycle with the resulting outcomes. The student analyzes the characteristics of the earth's layers and the location of the major plates. The student can describe how earthquakes, mountain building, volcanoes, and sea floor spreading are associated with movements of the earth's major plates. He/she analyzes how human activities and technologies affect the earth's land, oceans, and atmosphere.</p>	<p>A student at this level can select appropriate tools and techniques to analyze specific physical properties of minerals. He/she can build and apply a model of the rock cycle to predict the outcome of events that affect the cycle. The student can explain how the composition of earth's layers is related to plate movement. He/she evaluates how specific human activities and technologies affect the earth's land, oceans, and atmosphere.</p>

11.0 Motion	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 7 topic of Motion.</p>	<p>A student at this level can list the six types of simple machines. He/she recognizes the equation for work and can describe the concepts of speed and velocity. The student can define Newton's Laws of Motion. The student can list the parts of waves and explain some of the fundamental properties of waves.</p>	<p>A student at this level can explain the differences among the six types of simple machines. He/she applies the equation for work to determine the amount of force needed to do work under prescribed conditions. The student distinguishes between speed and velocity. He/she can describe how Newton's Laws of Motion explain an object's movement. The student can compare and contrast the basic parts of a wave, identify the fundamental features of waves, and identify different types of waves.</p>	<p>A student at this level can select the appropriate simple machine to perform a particular task. He/she can design and conduct a simple experiment to investigate the amount of force required to do work. The student can relate the phenomena of speed and motion to Newton's Laws of Motion. The student can build a model that represents wave parts, types, and properties.</p>
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Science Grade 8

Standards	<p style="text-align: center;">Not Proficient</p> <p>Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.</p>	<p style="text-align: center;">Approaching Proficient</p> <p>Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.</p>	<p style="text-align: center;">* Proficient</p> <p>Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.</p>	<p style="text-align: center;">Advanced</p> <p>Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.</p>
Embedded Inquiry	<p>NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.</p>			
Embedded Technology and Engineering	<p>NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.</p>			

<p style="text-align: center;">5.0 Biodiversity and Change</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 8 topic of Biodiversity and Change.</p>	<p>A student at this level can identify simple criteria to classify organisms into groups and use a simple classification key to identify a specific organism. The student recognizes how structural, behavioral, and physiological adaptations enable a population to survive and realizes that variations enhance a population's chances for survival. He/she recognizes the importance of maintaining the earth's biodiversity and understands that new technologies produce benefits and unintended consequences. The student identifies how fossils in sedimentary rock layers provide evidence of changing life forms.</p>	<p>A student at this level can apply different criteria to classify organisms into groups and use a simple classification key to identify an unknown organism. He/she analyzes how structural, behavioral, and physiological adaptations enable a population to survive, and can explain how variation enhances a population's chances for survival. He/she understands the importance of maintaining the earth's biodiversity and can compare intended benefits with the unintended consequences of a new technology. The student compares fossils in different sedimentary rock layers to provide evidence of changing life forms.</p>	<p>A student at this level can evaluate different criteria used to classify organisms into groups and design a classification key to identify a specific organism. The student explains how structural, behavioral, and physiological adaptations enable a population to survive and predicts which variations enhance a population's chances for survival. He/she evaluates the advantages of maintaining the earth's biodiversity and can differentiate between the intended benefits and unintended consequences of a new technology. The student compares fossils in sedimentary rock layers to create a geologic time table.</p>

<p style="text-align: center;">9.0 Matter</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 8 topic of Matter.</p>	<p>A student at this level recognizes that matter is comprised of atoms and recognizes that the properties of matter are determined by the structure and arrangement of atoms. The student can distinguish between physical and chemical changes. He/she can define elements, mixtures, and compounds. The student realizes that the atmosphere is a mixture of gases. The student recognizes that the periodic table represents all the known elements. The student can identify a balanced equation and define the Law of Conservation of Mass. He/she applies materials and techniques to identify acids and bases.</p>	<p>A student at this level understands that all matter is made of atoms and can explain how the properties of matter are determined by the structure and arrangement of atoms. He/she interprets data from an investigation to differentiate between physical and chemical changes. The student applies their understanding of the atmosphere to distinguish among elements, compounds, and mixtures. The student applies the periodic table to determine the characteristics of an element. The student applies the Law of Conservation of Mass to interpret a chemical reaction represented by an equation. He/she can describe the properties of acids and bases.</p>	<p>A student at this level understands that atoms contain subatomic particles which determine their properties. He/she designs an investigation to explore the differences between physical and chemical changes. The student can classify a substance as an element, compound, or mixture and apply this understanding to conclude that the atmosphere is a mixture of gases. The student can apply the periodic table to predict an element's properties based on its atomic number. He/she can balance a simple equation according to the Law of Conservation of Mass. He/she applies their knowledge of acids and bases to write the formula equation for an acid and base neutralization reaction.</p>

12.0 Forces in Nature

A student at this level has not demonstrated a basic understanding of the principles associated with the Grade 8 topic of Forces of Nature.

A student at this level can define electricity and magnetism. The student can describe an electromagnet and its component parts. The student recognizes that the earth has a magnetic field. He/she understands that distance and mass influence gravity and that gravitational attraction affects the movement of objects in the solar system.

A student at this level understands the relationship between magnetism and electricity and can relate these concepts to the design of electrical power generating facilities. He/she can interpret the results of an investigation designed to alter the strength of an electromagnet, identify possible sources of error, and offer alternative explanations. The student compares and contrasts the earth's magnetic field with that of a magnet/electromagnet. He/she can identify factors that affect the amount of gravitational force between objects and knows that gravity controls the movement of objects in the solar system.

A student at this level can design investigations to explore the relationship between magnetism and electricity and conditions that affect the strength of an electromagnet. He/she can describe the global and social impacts of the earth's magnetic field. The student can analyze data to reach conclusions about the effect of mass and distance on the amount of gravitational force between objects. He/she can construct a model to demonstrate how gravity controls the movement of objects in the solar system.

Biology

Standards	<p style="text-align: center;">Not Proficient</p> <p>Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.</p>	<p style="text-align: center;">Approaching Proficient</p> <p>Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.</p>	<p style="text-align: center;">* Proficient</p> <p>Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.</p>	<p style="text-align: center;">Advanced</p> <p>Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.</p>
Embedded Inquiry	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Technology and Engineering	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Mathematics	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			

<p style="text-align: center;">1.0 Cells</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Biology topic of Cells.</p>	<p>A student at this level can identify the structure and function of some cellular organelles and macromolecules found in prokaryotic and eukaryotic cells. He/she lists and describes the processes associated with cell regulation, growth, reproduction, and transport. The student can identify technologies that relate to cellular processes.</p>	<p>A student at this level can describe the structure and function of many cellular organelles and macromolecules found in prokaryotic and eukaryotic cells. He/she analyzes data found in illustrations and tables to explain the processes associated with cell regulation, growth, reproduction, and transport. The student can apply this knowledge to understand the applications of current biotechnologies.</p>	<p>A student at this level can compare the structure and function of numerous cellular organelles and macromolecules found in prokaryotic and eukaryotic cells. He/she develops models that illustrate processes associated with cell regulation, growth, reproduction, and transport. The student can apply this knowledge to describe the need for the development of new cellular technologies.</p>
<p style="text-align: center;">2.0 Interdependence</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Biology topic of Interdependence.</p>	<p>A student at this level can identify major interactions that occur between living things and abiotic factors of the environment. He/she recognizes that changes in an environmental variable can affect an ecosystem.</p>	<p>A student at this level can explain interactions that occur between living things and abiotic factors of the environment. He/she can describe the impact of altering a particular environmental variable on an ecosystem. The student recognizes that science, technology, and engineering are interrelated.</p>	<p>A student at this level can compare and contrast interactions that occur between different living things and particular abiotic factors of the environment. He/she can predict how changing multiple environmental variables may affect an ecosystem. The student can describe the dynamic relationship among science, technology, and engineering.</p>

<p style="text-align: center;">3.0 Flow of Matter and Energy</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Biology topics of Flow of Matter and Energy.</p>	<p>A student at this level can recognize that chemical cycling of matter and flow of energy through the biosphere are interrelated. He/she completes a scientific investigation to explore these processes.</p>	<p>A student at this level can explain relationships between the chemical cycling of matter and flow of energy through the biosphere. He/she designs and conducts a scientific investigation to explore these processes.</p>	<p>A student at this level can describe long-range effects of the chemical cycling of matter and flow of energy on the biosphere. He/she designs, conducts, and analyzes the results of a scientific investigation to explore these processes.</p>
<p style="text-align: center;">4.0 Heredity</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Biology topic of Heredity.</p>	<p>A student at this level recognizes a relationship among nucleic acids, genes, chromosomes, proteins, and hereditary traits. He/she can apply simple tools and techniques to predict the probability of inheriting a particular genetic trait. The student can identify some emerging genetic technologies and recognize their impact on social, ethical, political, and economic systems.</p>	<p>A student at this level can create a model that illustrates the relationships among nucleic acids, genes, chromosomes, proteins, and hereditary traits. He/she uses statistical methods to predict the probability of inheriting a simple genetic trait. The student can evaluate the impact of emerging genetic technologies on social, ethical, political, and economic systems.</p>	<p>A student at this level can explain detailed interrelationships among nucleic acids, genes, chromosomes, proteins, and hereditary traits. He/she selects and applies appropriate statistical methods to predict the probability of inheritance patterns. The student can analyze and debate the impact of various genetic technologies on social, ethical, political and economic systems.</p>

<p style="text-align: center;">5.0 Biodiversity and Change</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Biology topics of Biodiversity and Change.</p>	<p>A student at this level understands that the amount of biodiversity is controlled by environmental factors and influenced by humans. He/she recognizes that genetic variation within a population affects an individual's potential to survive and reproduce and the population's ability to respond to a changing environment. The student identifies key elements and assumptions found in accepted models of evolution and taxonomic systems.</p>	<p>A student at this level understands the causal relationship between the amount of biodiversity and natural and human impact on the environment. He/she can describe the connections among the amount of genetic variation in a population, individual survival and reproduction, and the evolution of a species. The student can determine which evolutionary models and taxonomic systems are best supported by scientific data.</p>	<p>A student at this level understands the potential impact of specific environmental changes on the level of biodiversity. He/she can explain causes of genetic variation and relationships among variation, adaptation, natural selection, and evolutionary change. The student evaluates evolutionary models and taxonomic systems using scientific data and discoveries from the field of genetics.</p>
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Chemistry

Standards	<p style="text-align: center;">Not Proficient</p> <p>Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.</p>	<p style="text-align: center;">Approaching Proficient</p> <p>Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.</p>	<p style="text-align: center;">* Proficient</p> <p>Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.</p>	<p style="text-align: center;">Advanced</p> <p>Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.</p>
Embedded Inquiry	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Technology and Engineering	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Mathematics	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			

1.0 Atomic Structure	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Chemistry topic of Atomic Structure.</p>	<p>A student at this level can use the periodic table to describe an elements' atomic structure and resulting chemical properties. He/she can describe various models of the atom in the correct historical sequence. The student can describe isotopes, ions, and the energy of electrons. The student can recognize why the properties of an element make it useful for various technological applications.</p>	<p>A student at this level can use the periodic table to compare the atomic structure and chemical properties of different elements. He/she can describe the experimental evidence that led to the development of different atomic models over time. The student can apply mathematical principles to understand isotopes, ions, and the energy of electrons. The student can apply the engineering design cycle to describe the connection between the properties of an element and its use by humans.</p>	<p>A student at this level can apply the periodic table to predict an elements' atomic structures and resulting chemical properties. He/she can evaluate the strengths and weakness of different models that have been used to describe the structure of an atom. He/she can describe the latest subatomic particles to have been identified. The student applies advanced mathematical operations to describe the characteristics of isotopes, ions, and the energy of electrons. The student can apply the engineering design cycle to predict potential uses for an element based on the properties of its atoms.</p>

<p style="text-align: center;">2.0 Matter and Energy</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Chemistry topic of Matter and Energy.</p>	<p>A student at this level can use appropriate tools and techniques to explore the properties of matter and the interactions between matter and energy. He/she can translate data into a table or graph to draw a simple conclusion. The student can apply given mathematical equations to study the properties of matter and the interactions between matter and energy.</p>	<p>A student at this level can select appropriate tools and techniques to investigate the properties of matter and the interactions between matter and energy. He/she can apply qualitative and quantitative techniques to analyze data, interpolate between data points in a graph, and draw accurate conclusions. The student can select the appropriate mathematical equations used to study a particular property of matter and the interactions between matter and energy.</p>	<p>A student at this level can design and conduct complex investigations of the properties of matter and the interactions between matter and energy using appropriate tools and techniques. He/she can modify experimental conditions to produce different results. He/she can select appropriate qualitative and quantitative measures to analyze data, interpolate between and extrapolate from data points in a graph, and draw accurate conclusions. The student can apply complex mathematical equations to study the properties of matter and the interactions between matter and energy.</p>

3.0 Interactions of Matter

A student at this level has not demonstrated a basic understanding of the principles associated with the Chemistry topic of Interaction of Matter.

A student at this level demonstrates an understanding of the law of conservation of matter by writing a balanced chemical equation and solving basic stoichiometric problems. He/she can compare nuclear processes to chemical and physical processes and recognize examples of nuclear decay. The student can identify some impacts of nuclear energy technology on social, political, and economic systems.

A student at this level demonstrates an understanding of the law of conservation of matter by writing balanced chemical equations, predicting products, and analyzing stoichiometric relationships. He/she can interpret equations used to describe nuclear decay. The student can debate the pros and cons of nuclear energy technology on social, political, and economic systems.

A student at this level demonstrates an understanding of the law of conservation of matter by writing balanced chemical equations and analyzing stoichiometric relationships with high levels of complexity. He/she can write equations used to describe nuclear decay. The student can evaluate specific cause and effect relationships between nuclear energy technology and social, political, and economic systems.

Physics

Standards	<p style="text-align: center;">Not Proficient</p> <p>Students who perform at this level have not demonstrated mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are not prepared for the next level of study.</p>	<p style="text-align: center;">Approaching Proficient</p> <p>Students who perform at this level demonstrate partial mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are minimally prepared for the next level of study.</p>	<p style="text-align: center;">* Proficient</p> <p>Students who perform at this level demonstrate mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are well prepared for the next level of study.</p>	<p style="text-align: center;">Advanced</p> <p>Students who perform at this level demonstrate superior mastery in academic performance, thinking abilities, and application of understandings that reflect the knowledge and skills specified by the grade/course level content standards and are significantly prepared for the next level of study.</p>
Embedded Inquiry	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Technology and Engineering	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course.			
Embedded Mathematics	NOTE: embedded standards are taught and assessed as components that are integrated into the science content at each grade level or course			

<p style="text-align: center;">1.0 Mechanics</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Physics topic of Mechanics.</p>	<p>A student at this level can identify which of Newton's laws of motion are represented in a particular situation. The student can identify the correct variables and apply given kinematics equations to solve for unknown quantities. He/she can design an experiment to determine distance/time and velocity/time relationships. The student can analyze vector diagrams. He/she applies the law of conservation of energy to describe conversions between different forms of energy.</p>	<p>A student at this level can explain why Newton's laws of motion are applicable in a particular situation. The student can identify the correct variables and select and apply the proper kinematics equations to solve for unknown quantities. He/she can interpret distance/time and velocity/time graphs, and understands the physical meaning of slope. The student resolves and determines resultant vectors. He/she applies the law of conservation of energy to calculate conversions between different forms of energy.</p>	<p>A student at this level can select and apply the appropriate law of motion to interpret a particular situation. The student can identify the correct variables and derive kinematics equations to solve for unknown quantities. He/she can prepare and interpret distance/time and velocity/time graphs, and understands the physical meaning of slope. He/she understands methods to approximate instantaneous values for non-linear data. The student uses trigonometric functions to resolve and determine resultant vectors. He/she can design an investigation that applies the law of conservation of energy to calculate conversions between various forms of energy.</p>

<p style="text-align: center;">2.0 Thermodynamics</p>	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Physics topic of Thermodynamics.</p>	<p>A student at this level can describe the basic relationship between the laws of thermodynamics and conservation of energy. He/she uses tools and measurement scales to explore changes in heat content and associates resulting observations with kinetic energy and specific heat. He/she can graph complex data to draw conclusions. A student can apply given equations and analyze data for thermal expansion and contraction.</p>	<p>A student at this level can explain the relationship between the laws of thermodynamics and conservation of energy. He/she selects and uses appropriate tools and measurement scales to investigate changes in heat content and can associate the results with kinetic energy and specific heat. He/she can extrapolate between data points to make predictions. A student can identify the proper equations and analyze data for thermal expansion and contraction.</p>	<p>A student at this level can explain the complex connection between the laws of thermodynamics and conservation of energy. He/she can design an investigation to study changes in heat content and associate the results with kinetic energy and specific heat. He/she can interpolate and extrapolate between data points to make inferences and predictions. A student can select and apply appropriate equations and analyze complex data for thermal expansion and contraction.</p>

3.0 Waves	<p>A student at this level has not demonstrated a basic understanding of the principles associated with the Physics topic of waves.</p>	<p>A student at this level can identify examples of simple harmonic motion and calculate amplitude and period of oscillation. He/she understands the relationship between the velocity, frequency and wavelength of a sound wave. The student recognizes that wave characteristics vary with temperature, density, and elasticity of the medium. He/she can predict the change in apparent frequency for a stationary observer. He/she can measure the spring constant in a laboratory setting. The student can interpret a graphical representation of a transverse wave that illustrates wavelength, amplitude, and frequency.</p>	<p>A student at this level can describe simple harmonic motion and use laboratory equipment to determine amplitude and period of oscillation. He/she can explain how the velocity, frequency and wavelength of a sound wave are affected by the physical environment. The student can apply Doppler shift equations to calculate apparent frequency and velocity for a stationary observer. He/she can calculate the spring constant using Hooke's law. The student can prepare a graphical representation of a transverse wave that illustrates the correct wavelength, amplitude, and frequency.</p>	<p>A student at this level can design a method to determine the amplitude and period of oscillation of simple harmonic motion. He/she can predict how the velocity, frequency and wavelength of a sound wave will be affected by different physical environments. The student can apply complex Doppler shift equations to calculate apparent frequency or velocity for a stationary or moving observer. He/she can design an investigation to determine the spring constant. The student can design an investigation to study the properties of transverse waves.</p>

4.0 Optics

A student at this level has not demonstrated a basic understanding of the principles associated with the Physics topic of Optics.

A student at this level can distinguish among different forms of electromagnetic energy. The student can interpret an optical scenario to determine image distance, image height, and magnification. He/she can describe a formed image based on an object's location and type of lens or mirror. The student can name the major tenets of the ray, wave, and particle models of light. He/she can predict the type of refraction that occurs at the boundary between two different optical media. The student can use additive and subtractive processes to determine color combinations for light and pigments. He/she understands that optical media are used to store information and how this ability is used by the communication industry.

A student at this level can explain the difference among various forms of electromagnetic energy and determine their sources. The student can use algebraically manipulated versions of the lens maker's equation to solve for image distance, image height, and magnification. He/she can explain the relationships among a formed image, an object's location, and the type of lens or mirror. The student can compare and contrast the major tenets of the ray, wave, and particle models of light. He/she can apply Snell's law to determine the angle of refraction between different optical media. The student can design an investigation of additive and subtractive processes to determine color combinations for light and pigments. He/she can describe how optical media store information and why applications of optic principles have led to advancements in the communication industry.

A student at this level can rank order the different forms of electromagnetic energy in terms of wavelength and describe their different properties. The student can apply the lens maker's equation to solve for image distance, image height, and magnification. He/she can predict the nature of a formed image based on an object's location and the type of lens or mirror. The student can explain and apply the ray, wave and particle models of light. He/she can apply Snell's law to determine the angle of refraction and critical angle between different optical media. The student is able to apply the additive and subtractive processes to predict color combinations for light and pigments. He/she can explain how new optical tools and technologies are utilized by the communication industry.

5.0 Electricity and Magnetism

A student at this level has not demonstrated a basic understanding of the principles associated with the Physics topics of Electricity and Magnetism.

A student at this level can describe the force on a charge caused by other charges in an electric field and sketch the orientation of the electric field. He/she can apply given equations to solve for voltage, current, and resistance. The student draws and interprets diagrams of series and parallel circuits and calculates the equivalent resistance of the circuit. He/she can build simple series and parallel circuits in the laboratory. The student understands that a magnetic field can induce current.

A student at this level can apply Coulomb's law to predict the force on a charge due to other charges. He/she uses Ohm's law to solve for voltage, current, and resistance. The student interprets series and parallel circuit diagrams to determine voltage and current drops at various points in the circuit. The student can compare equivalent resistance for series and parallel circuits. He/she can build functional series and parallel circuits in the laboratory. The student can conduct an experiment to induce a current from a magnetic field and describe how this process occurs in a motor.

A student at this level can apply Coulomb's law to predict the net force on a charge, given a complex charge distribution. He/she designs an investigation that demonstrates how Ohm's law is applied to solve for voltage, current or resistance. The student can prepare series, parallel, and complex circuit diagrams that illustrate voltage and current drops at various points in the circuit. The student can determine equivalent resistance for series, parallel, and complex circuits. He/she selects appropriate components to build functional series, parallel, and complex circuits in the laboratory. The student can design an experiment to induce a current from a magnetic field and use this current in a practical circuit.

6.0 Nuclear Physics

A student at this level has not demonstrated a basic understanding of the principles associated with the Physics topic of Nuclear Physics.

A student at this level understands the structure and properties of the atom. The student recognizes that the nucleus of radioactive elements is dynamic and that it decays in predictable ways. The student can compare atomic models. He/she can quantify nuclear physics using nuclear equations and describe these phenomena. He/she can describe the fundamental difference between nuclear fission and fusion. He/she can discuss the impact of nuclear energy technology on social, political, and economic systems.

A student at this level can describe the structure and properties of the atom. The student can describe factors that make the nucleus of radioactive elements dynamic and explain why it decays in predictable ways. The student can compare and contrast the Bohr and quantum models of the atom. He/she can quantify nuclear physics using nuclear equations and apply quantum theory to interpret these phenomena. The student can compare and contrast nuclear fission and fusion. He/she can evaluate the pros and cons of current applications of nuclear technology.

A student at this level can associate specific properties of the atom with particular structures. The student understands why the nucleus of radioactive elements is dynamic and decays in predictable ways. He/she can quantify nuclear physics using complex nuclear equations and apply quantum theory to explain these phenomena. The student can compare and contrast particular examples of nuclear fission and fusion. He/she applies the engineering design process to develop ideas for safer and more efficient ways to utilize nuclear technology.