

## New Mexico Expanded Grade Band Expectations Science: Grades 7 and 8

### Strand I: SCIENTIFIC THINKING AND PRACTICE

**Standard I: Understand the processes of scientific investigations and use inquiry and scientific ways of observing, experimenting, predicting, and validating to think critically**

	<b>5–8 Benchmark 1:</b> Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings		<b>5–8 Benchmark 2:</b> Understand the processes of scientific investigation and how scientific inquiry results in scientific knowledge		<b>5–8 Benchmark 3:</b> Use mathematical ideas, tools, and techniques to understand scientific knowledge	
<b>ENGAGEMENT</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>1-a indicates that scientific problems exist as a result of collecting and responding to information</i>	7.1 8.2	<i>1-a responds to routine events while participating in investigative science activities</i>	7.2 8.3	<i>1-a attends to scientific tools and materials that are reflective of grade band expectations for at least a few seconds at a time on a regular basis</i>	7.3 8.2
	<i>2-a maintains and shifts attention between one or more science objects, activities, or social partners while participating in activities related to scientific methods of inquiry</i>	7.1 8.2	<i>2-a recognizes that actions have consequences</i>	7.2 8.3	<i>2-a indicates understanding of routine events occurring in sequenced science activities</i>	7.3 8.2

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<b>PRE-SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>4-a identifies problems/issues that exist in the physical world</i>	8.1	<i>4-a identifies problems/issues that exist in the physical world</i>	8.1		
	<i>4-b investigates data presented in graph, chart, and table form</i>	8.2	<i>4-b investigates problems/issues with peers</i>	8.3		
<b>SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>5-a collects specific data related to a posed scientific question or problem</i>	8.2	<i>6-a uses defined criteria to investigate a hypothesis for a given scientific problem with peers</i>	7.2 8.3	<i>5-a demonstrates that numerals can be used to convey information about the physical world (e.g., number of objects, tallying measurable observations)</i>	7.2 8.1
	<b>5-b communicates observations about the world</b>	7.2	<i>6-b discusses how bias can affect scientific investigation and conclusions</i>	7.1	<i>5-b investigates models that describe phenomena (e.g., water cycle, food chain, lines of force of magnets)</i>	7.3 8.2

	<b>5–8 Benchmark 1:</b> Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings		<b>5–8 Benchmark 2:</b> Understand the processes of scientific investigation and how scientific inquiry results in scientific knowledge		<b>5–8 Benchmark 3:</b> Use mathematical ideas, tools, and techniques to understand scientific knowledge	
	<b>6-a systematically records data, using appropriate tools, related to a problem or observation (e.g., average height in the classroom)</b>	8.1			<i>6-a recognizes that tables, charts, and graphs contain information that can be used to answer specific questions</i>	8.1
<b>EXTENDED SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>7-a constructs appropriate graphs, tables, and charts from data to determine simple relationships between two variables</i>	7.2 8.2	<i>7-a communicates basic understanding of scientific investigation (e.g., hypothesis, experiment, conclusion)</i>	8.3	<i>7-a uses mathematical numerals to represent measurable data and observations</i>	7.2 8.1
	<i>7-b identifies anomalous data in a given data set</i>	8.3	<i>7-b formulates hypotheses that potentially explain observations</i>	7.2	<i>7-b uses an appropriate model to examine a phenomenon of interest</i>	7.3 8.2
	<i>8-a plans and conducts an investigation, including formulating a question, making observations, developing conclusions, and communicating findings</i>	7.1 8.2	<i>8-a shares the results of an experiment with peers and gathers feedback regarding their respective acceptance or rejection of the hypothesis and conclusion</i>	8.3	<i>8-a creates a simple model to describe phenomena (e.g., water cycle, food chain, lines of force of magnets)</i>	7.3 8.2

	<b>5–8 Benchmark 1:</b> Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings		<b>5–8 Benchmark 2:</b> Understand the processes of scientific investigation and how scientific inquiry results in scientific knowledge		<b>5–8 Benchmark 3:</b> Use mathematical ideas, tools, and techniques to understand scientific knowledge	
	<b>8-b uses available tools to collect and analyze data (e.g., calculators, computers, balances, spring scales, microscopes)</b>	7.1 8.2	<i>8-b discusses the process required to generate scientific knowledge</i>	7.3 8.2 8.3	<b>8-b communicates findings using mathematical expressions (e.g., number of objects counted, estimation, mean) with graphs, tables, charts</b>	7.2 8.1 8.2
	<b>8-c uses a variety of graphic models to present data (e.g., charts, graphs, tables, labeled diagrams)</b>	7.2 8.2	<i>8-c examines alternative explanations for observations with peers</i>	7.2 8.1	<i>8-c demonstrates that the number of data (sample size) influences the reliability of a prediction (e.g., replicating a heads/tails coin experiment three times vs. 20 times)</i>	7.1

**S Strand II: CONTENT OF SCIENCE**

**Standard I (Physical Science): Understand the structure and properties of matter, the characteristics of energy, and the interactions between matter and energy**

	<b>5–8 Benchmark 1:</b> Know the forms and properties of matter and how matter interacts		<b>5–8 Benchmark 2:</b> Explain the physical processes involved in the transfer, change, and conservation of energy		<b>5–8 Benchmark 3:</b> Describe and explain forces that produce motion in objects	
<b>ENGAGEMENT</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>1-a responds to changes in properties (e.g., textures and forms)</i>	7.4 8.1 8.8	<i>1-a responds to changes in environmental conditions involving energy (e.g., light, temperature)</i>	8.1	<b>1-a responds to changes in movement and touch</b>	7.1 8.2
	<i>2-a responds selectively to properties of matter (e.g., hard/soft, scratchy/smooth, round/square)</i>	7.4 8.1 8.8	<i>2-a responds selectively to environmental conditions (e.g., hot/cold, light/dark)</i>	8.1	<b>2-a shows a preference for different types of movement (e.g., rocking, bouncing) and touch (e.g., heavy/light)</b>	7.1 8.2
<b>PRE-SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>4-a describes functional changes in matter (e.g., melting)</i>	8.7	<i>4-a initiates purposeful activity in response to environmental conditions (e.g., light, heat, sound, and pressure)</i>	7.1	<b>3-a recognizes that force produces motion</b>	7.1 8.2
					<b>4-a identifies actions or motion of objects</b>	7.1 8.2 8.3

	<b>5–8 Benchmark 1:</b> Know the forms and properties of matter and how matter interacts		<b>5–8 Benchmark 2:</b> Explain the physical processes involved in the transfer, change, and conservation of energy		<b>5–8 Benchmark 3:</b> Describe and explain forces that produce motion in objects	
<b>SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>6-a distinguishes between simple metals and non-metals (e.g., iron vs. plastic)</i>	8.2			<i>5-a demonstrates that equal forces acting on an object in opposition cancel each other out</i>	8.3
					<i>6-a identifies simple machines (e.g., wedges, inclined planes, levers, wheels and axles, pulleys, screws)</i>	7.1
<b>EXTENDED SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<b>7-a demonstrates how matter changes phases (e.g., ice to water to steam)</b>	8.1	<i>7-a describes various sources for the production of electricity (e.g., coal plants, wind generators, solar cells, geothermal plants, nuclear power plants)</i>	8.4	<i>7-a demonstrates that when greater force is applied to an object, a proportionally greater acceleration will occur</i>	8.8
	<b>7-b describes physical and chemical changes that occur naturally (e.g., snow melting, photosynthesis, rusting, burning, mixing sugar in tea)</b>	7.5 8.8	<i>8-a describes the conversion of some energy into heat when energy changes forms</i>	8.1	<i>7-b demonstrates that greater force is needed to move objects with greater mass</i>	8.8

	<b>5–8 Benchmark 1:</b> Know the forms and properties of matter and how matter interacts		<b>5–8 Benchmark 2:</b> Explain the physical processes involved in the transfer, change, and conservation of energy		<b>5–8 Benchmark 3:</b> Describe and explain forces that produce motion in objects	
	<b>8-a describes phase changes among states of matter (e.g., evaporation, condensation, melting)</b>	8.7	<i>8-b describes the environmental effects of mankind’s use of electricity (e.g., pollution, global warming, water quality)</i>	7.1	<i>8-a describes fundamental forces in nature (e.g., gravity, magnetism, electricity, friction, nuclear)</i>	8.1
	<i>8-b uses properties to identify substances (e.g., hardness, color, texture, smell)</i>	8.3			<i>8-b demonstrates understanding of forces causing motion in living systems (e.g., lever in muscular/skeletal system, heart generating blood pressure)</i>	7.1
	<i>8-c demonstrates that chemical reactions can absorb energy (endothermic) or release energy (exothermic)</i>	7.5 8.10			<i>8-c demonstrates understanding that force has both magnitude and direction</i>	8.2
	<i>8-d uses models to investigate the structure of simple atoms and molecules</i>	8.3 8.4				

**Strand II: CONTENT OF SCIENCE**

**Standard II (Life Science): Understand the properties, structures, and processes of living things and the interdependence of living things and their environments**

	<b>5–8 Benchmark 1:</b> Explain the diverse structures and functions of living things and the complex relationships between living things and their environments		<b>5–8 Benchmark 2:</b> Understand how traits are passed from one generation to the next and how species evolve		<b>5–8 Benchmark 3:</b> Understand the structure of organisms and the function of cells in living systems	
<b>ENGAGEMENT</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<b>1-a attends to others in the environment for at least a few seconds at a time on a regular basis as demonstrated by physical orientation, when possible, toward others and a change in previous activity or behavior</b>	7.1 7.4	<b>1-a attends to others in the environment for at least a few seconds at a time on a regular basis as demonstrated by physical orientation, when possible, toward others and a change in previous activity or behavior</b>	7.5	<i>1-a responds to a variety of sensory information or stimuli (e.g., smell, visual, taste, touch, sound or movement) that represent the structure of organisms</i>	7.1
	<i>2-a attends to living things in the environment</i>	7.1 7.4	<i>2-a distinguishes between self and others</i>	7.5	<i>2-a distinguishes between self-directed movement and being moved by others</i>	7.1
			<b>2-b distinguishes between different organisms</b>	7.5	<b>2-b distinguishes between different organisms</b>	7.1

	<b>5–8 Benchmark 1:</b> Explain the diverse structures and functions of living things and the complex relationships between living things and their environments		<b>5–8 Benchmark 2:</b> Understand how traits are passed from one generation to the next and how species evolve		<b>5–8 Benchmark 3:</b> Understand the structure of organisms and the function of cells in living systems	
<b>PRE-SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>4-a matches organisms to specific ecosystems in which they live (e.g., beavers to riparian ecosystem)</i>	7.1 7.3	<b>3-a matches graphic representations of like plants and animals (species)</b>	7.5	<i>4-a matches plant cells with plant cells and animal cells with animal cells</i>	7.1 7.2 7.4
					<i>4-b identifies characteristics of plant cells</i>	7.1 7.4
					<i>4-c identifies characteristics of animal cells</i>	7.2 7.4
<b>SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<b>6-a describes how individuals interact with physical environments to create an ecosystem (e.g., populations, communities, niches, habitats, food webs)</b>	7.3	<i>5-a identifies characteristics that are the same between parents and offspring</i>		<i>5-a distinguishes between plant and animal cells</i>	7.4

	<b>5–8 Benchmark 1:</b> Explain the diverse structures and functions of living things and the complex relationships between living things and their environments		<b>5–8 Benchmark 2:</b> Understand how traits are passed from one generation to the next and how species evolve		<b>5–8 Benchmark 3:</b> Understand the structure of organisms and the function of cells in living systems	
	<b>6-b demonstrates understanding that organisms are classified by their characteristics into different groups (e.g., domain, kingdom, phylum, class, order, family, genus, species)</b>	7.7	<i>6-a explains how reproduction is a characteristic of all living things and is essential to the continuation of the species</i>	7.1	<i>6-a describes how radiation, UV light, and drugs can damage cells</i>	7.6
			<i>6-b identifies adaptations that species have undergone that resulted in an advantage within a specific environment</i>	7.5 7.7 7.10	<i>6-b compares the structure and processes of plant and animal cells</i>	7.4
			<i>6-c identifies adaptations that species have undergone that resulted in the extinction of the species within a specific environment</i>	7.12		

	<b>5–8 Benchmark 1:</b> Explain the diverse structures and functions of living things and the complex relationships between living things and their environments		<b>5–8 Benchmark 2:</b> Understand how traits are passed from one generation to the next and how species evolve		<b>5–8 Benchmark 3:</b> Understand the structure of organisms and the function of cells in living systems	
<b>EXTENDED SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>		<b>GLPS</b>
	<i>7-a demonstrates how energy flows through ecosystems (e.g., sunlight, green plants, food for animals)</i>	8.2	<i>7-a compares how a variety of organisms have changed over generations, based upon the fossil record</i>	7.8	<i>7-a demonstrates understanding that cells perform specialized functions (e.g., reproduction, digestion, movement)</i>	7.3
	<i>7-b describes the resources needed to sustain life in a variety of ecosystems</i>	7.4	<b>7-b demonstrates understanding that parents pass along inheritable traits to their offspring</b>	7.5	<i>7-b identifies unicellular and multicellular organisms</i>	7.1
	<i>8-a discusses how available resources limit growth (e.g., quantity of light and water, temperature ranges, soil composition)</i>	7.5	<i>7-c demonstrates understanding that genes contain hereditary information that determines specific traits</i>	7.6	<i>8-a explains how photosynthesis is the process that green plants use to capture and store energy from the sun</i>	7.4 8.2
	<i>8-b describes how organisms adapt to various environmental conditions</i>	7.4	<i>8-a identifies traits that are inherited by offspring of both plants and animals (e.g., flower color, eye color)</i>	7.5	<i>8-b explains how organs are composed of tissues of different types of cells (e.g., skin, bone, muscle, heart, intestines)</i>	7.2

	<b>5–8 Benchmark 1:</b> Explain the diverse structures and functions of living things and the complex relationships between living things and their environments		<b>5–8 Benchmark 2:</b> Understand how traits are passed from one generation to the next and how species evolve		<b>5–8 Benchmark 3:</b> Understand the structure of organisms and the function of cells in living systems	
	<i>8-c describes key components of the New Mexico biome (e.g., desert, pine forest)</i>	7.2	<b>8-b demonstrates understanding that organisms that reproduce sexually fertile offspring are members of the same species</b>	7.4	<i>8-c describe how cells survive by using energy to perform cellular functions such as respiration</i>	8.1
	<i>8-d demonstrates how matter moves through ecosystems (e.g., water cycle, carbon cycle)</i>	8.1				

**Strand II: CONTENT OF SCIENCE**

**Standard III (Earth and Space Science): Understand the structure of Earth, the solar system, and the universe, the interconnections among them, and the processes and interactions of Earth’s systems**

	<b>5–8 Benchmark 1:</b> Describe how the concepts of energy, matter, and force can be used to explain the observed behavior of the solar system, the universe, and their structures		<b>5–8 Benchmark 2:</b> Describe the structure of Earth and its atmosphere and explain how energy, matter, and forces shape Earth’s systems	
<b>ENGAGEMENT</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>
	<i>1-a attends to objects in the sky (e.g., planets, moon, sun, stars)</i>	7.1 8.1	<i>1-a responds to atmospheric changes (e.g., wind, water, weather)</i>	7.2 8.2
	<i>2-a shifts attention to objects in the sky (e.g., planets, moon, sun, stars)</i>	7.1 8.1	<i>2-a shifts attention to atmospheric changes (wind, water, weather)</i>	7.2 8.2
<b>PRE-SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>
<b>SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>
<b>EXTENDED SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>		<b>GLPS</b>
	<i>8-a explains how the Earth is unique in its ability to support life in our solar system and how the sun is the source of our energy</i>	7.1 7.2 8.1	<i>8-a demonstrates understanding that landforms are shaped by constructive and destructive forces (e.g., weather, erosion, plate tectonics, volcanoes, asteroids, glaciers)</i>	7.7 7.8
			<i>8-b demonstrates understanding of the role that water plays on Earth (e.g., water vapor, water cycle, erosion, surface waters, solvent)</i>	8.2

**Strand III: SCIENCE AND SOCIETY**

**Standard I: Understand how scientific discoveries, inventions, practices, and knowledge influence, and are influenced by, individuals and societies**

	<b>5–8 Benchmark 1:</b> Explain how scientific discoveries and inventions have changed individuals and societies	
<b>ENGAGEMENT</b>	<b>The student</b>	<b>GLPS</b>
	<i>1-a attends to others while participating in discussions about how scientific discoveries (e.g., transportation, entertainment, health, nutrition, medicine, computers, space exploration) have changed individuals and societies</i>	7.1 7.3 8.3
	<i>2-a responds to others while participating in activities that address how scientific discoveries (e.g., transportation, entertainment, health, nutrition, medicine, computers, space exploration) have changed individuals and societies</i>	7.1 7.3 8.3
<b>PRE-SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>
<b>SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>
	<i>5-a identifies how scientific knowledge has shaped our decision-making processes (e.g., nutrition, hygiene, preventative medicine, medical treatment, exploration)</i>	8.3
<b>EXTENDED SYMBOLIC</b>	<b>The student</b>	<b>GLPS</b>
	<i>7-a describes how various technologies have affected the lives of individuals (e.g., assistive technology, transportation, entertainment, health, energy production)</i>	7.1 8.3
	<i>7-b describes how scientific information can help people respond to health emergencies (e.g., CPR, epidemics, HIV, bioterrorism)</i>	7.3
	<i>8-a describe the technologies that are responsible for revolutionizing communications, medicine, health, energy production</i>	7.1 7.2 7.3 8.4
	<i>8-b describe how scientific information can help explain environmental phenomena (e.g., floods, earthquakes, volcanoes, fire, extreme weather)</i>	8.2
	<i>8-c analyze the risks associated with energy production</i>	8.4

