

Vertical Alignment Document

Science

Kindergarten – Grade 2

2011 – 2012



SCIENCE VERTICAL ALIGNMENT DOCUMENT

KINDERGARTEN	GRADE 1	GRADE 2
<p>§112.10. Implementation of Texas Essential Knowledge and Skills for Science, Elementary, Beginning with School Year 2010-2011. <i>Source: The provisions of this §112.10 adopted to be effective August 4, 2009, 34 TexReg 5063; amended to be effective August 24, 2010, 35 TexReg 7230.</i></p>		
<p>§112.11. - §112.13. Science, Kindergarten – Grade 2, Beginning with School Year 2010-2011.</p>		
<p>(a) Introduction.</p>		
<p>(1) Science, as defined by the National Academy of Sciences, is the "use of evidence to construct testable explanations and predictions of natural phenomena, as well as the knowledge generated through this process."</p>		
<p>(2) Recurring themes are pervasive in sciences, mathematics, and technology. These ideas transcend disciplinary boundaries and include patterns, cycles, systems, models, and change and constancy.</p>		
<p>(3) The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific processes, including inquiry methods, analyzing information, making informed decisions, and using tools to collect and record information, while addressing the major concepts and vocabulary in the context of physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 80% of instructional time.</p>		<p>(3) The study of elementary science includes planning and safely implementing classroom and outdoor investigations using scientific processes, including inquiry methods, analyzing information, making informed decisions, and using tools to collect and record information, all while addressing the major concepts and vocabulary in the context of physical, earth, and life sciences. Districts are encouraged to facilitate classroom and outdoor investigations for at least 60% of instructional time.</p>
<p>(4) In Kindergarten, students observe and describe the natural world using their five senses. Students do science as inquiry in order to develop and enrich their abilities to understand scientific concepts and processes. Students develop vocabulary through their experiences investigating properties of common objects, earth materials, and organisms.</p> <p>(A) A central theme throughout the study of scientific investigation and reasoning, matter and energy; force, motion, and energy; Earth and space; and organisms and environment is active</p>	<p>(4) In Grade 1, students observe and describe the natural world using their five senses. Students do science as inquiry in order to develop and enrich their abilities to understand the world around them in the context of scientific concepts and processes. Students develop vocabulary through their experiences investigating properties of common objects, earth materials, and organisms.</p> <p>(A) A central theme in first grade science is active engagement in asking questions, communicating ideas, and exploring with scientific tools in order to explain scientific concepts and</p>	<p>(4) In Grade 2, careful observation and investigation are used to learn about the natural world and reveal patterns, changes, and cycles. Students should understand that certain types of questions can be answered by using observation and investigations and that the information gathered in these may change as new observations are made. As students participate in investigation, they develop the skills necessary to do science as well as develop new science concepts.</p> <p>(A) Within the physical environment, students expand their</p>

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<p>engagement in asking questions, communicating ideas, and exploring with scientific tools. Scientific investigation and reasoning involves practicing safe procedures, asking questions about the natural world, and seeking answers to those questions through simple observations and descriptive investigations.</p> <p>(B) Matter is described in terms of its physical properties, including relative size and mass, shape, color, and texture. The importance of light, heat, and sound energy is identified as it relates to the students' everyday life. The location and motion of objects are explored.</p> <p>(C) Weather is recorded and discussed on a daily basis so students may begin to recognize patterns in the weather. Other patterns are observed in the appearance of objects in the sky.</p> <p>(D) In life science, students recognize the interdependence of organisms in the natural world. They understand that all organisms have basic needs that can be satisfied through interactions with living and nonliving things. Students will investigate the life cycle of plants and identify likenesses between parents and offspring.</p>	<p>processes like scientific investigation and reasoning, matter and energy, force, motion, and energy, Earth and space, and organisms and environment. Scientific investigation and reasoning involves practicing safe procedures, asking questions about the natural world, and seeking answers to those questions through simple observations and descriptive investigations.</p> <p>(B) Matter is described in terms of its physical properties, including relative size and mass, shape, color, and texture. The importance of light, heat, and sound energy is identified as it relates to the students' everyday life. The location and motion of objects are explored.</p> <p>(C) Weather is recorded and discussed on a daily basis so students may begin to recognize patterns in the weather. In addition, patterns are observed in the appearance of objects in the sky.</p> <p>(D) In life science, students recognize the interdependence of organisms in the natural world. They understand that all organisms have basic needs that can be satisfied through interactions with living and nonliving things. Students will investigate life cycles of animals and identify likenesses between parents and offspring.</p>	<p>understanding of the properties of objects such as shape, mass, temperature, and flexibility then use those properties to compare, classify, and then combine the objects to do something that they could not do before. Students manipulate objects to demonstrate a change in motion and position.</p> <p>(B) Within the natural environment, students will observe the properties of earth materials as well as predictable patterns that occur on Earth and in the sky. The students understand that those patterns are used to make choices in clothing, activities, and transportation.</p> <p>(C) Within the living environment, students explore patterns, systems, and cycles by investigating characteristics of organisms, life cycles, and interactions among all the components within their habitat. Students examine how living organisms depend on each other and on their environment.</p>

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KINDERGARTEN		GRADE 1		GRADE 2	
SCIENTIFIC INVESTIGATION AND REASONING FORCE, MOTION, AND ENERGY					
K.6	<i>Force, motion, and energy. The student knows that energy, force, and motion are related and are a part of their everyday life. The student is expected to:</i>	1.6	<i>Force, motion, and energy. The student knows that force, motion, and energy are related and are a part of everyday life. The student is expected to:</i>	2.6	<i>Force, motion, and energy. The student knows that forces cause change and energy exists in many forms. The student is expected to:</i>
K.6A	<p>Use the five senses to explore different forms of energy such as light, heat, and sound.</p> <p>Use</p> <p>THE FIVE SENSES TO EXPLORE DIFFERENT FORMS OF ENERGY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Light • Sources of light • Color • Heat • Sources of heat • Sound • Sources of sound (loud, soft, high, low) 	1.6A	<p>Identify and discuss how different forms of energy such as light, heat, and sound are important to everyday life.</p> <p>Identify, Discuss</p> <p>HOW DIFFERENT FORMS OF ENERGY ARE IMPORTANT TO EVERYDAY LIFE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Light • Sunlight • Artificial light • Heat • Sun • Fire • Appliances • Sound • Safety 	2.6A	<p>Investigate the effects on an object by increasing or decreasing amounts of light, heat, and sound energy such as how the color of an object appears differently in dimmer light or how heat melts butter.</p> <p>Investigate</p> <p>THE EFFECTS ON AN OBJECT BY INCREASING OR DECREASING THE AMOUNTS OF ENERGY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Light • Color of an object appearing differently in dimmer light • Affects on plant growth • Heat • Adding heat melts butter • Changes in temperature • Sound • Pitch • Volume
K.6B	<p>Explore interactions between magnets and various materials.</p> <p>Explore</p>	1.6B	<p>Predict and describe how a magnet can be used to push or pull an object.</p> <p>Predict, Describe</p>	2.6B	<p>Observe and identify how magnets are used in everyday life.</p> <p>Observe, Identify</p>

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KINDERGARTEN		GRADE 1		GRADE 2	
	<p>INTERACTIONS BETWEEN MAGNETS AND VARIOUS MATERIALS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Magnetic materials • Nonmagnetic materials 		<p>HOW A MAGNET CAN BE USED TO PUSH OR PULL AN OBJECT</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Attracting (pull) • Repelling (push) 		<p>HOW MAGNETS ARE USED IN EVERYDAY LIFE</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Separation of metals • Machines • Toys
K.6C	<p>Observe and describe the location of an object in relation to another such as above, below, behind, in front of, and beside.</p> <p>Observe, Describe</p> <p>THE LOCATION OF AN OBJECT IN RELATION TO ANOTHER</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Above • Below • Behind • In front of • Beside 	1.6C	<p>Describe the change in the location of an object such as closer to, nearer, and farther from.</p> <p>Describe</p> <p>THE CHANGE IN THE LOCATION OF AN OBJECT</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Closer/nearer to • Farther from 	2.6C	<p>Trace the changes in the position of an object over time such as a cup rolling on the floor and a car rolling down a ramp.</p> <p>Trace</p> <p>THE CHANGES IN THE POSITION OF AN OBJECT OVER TIME</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • A cup rolling on the floor • A car rolling down a ramp • Pushed • Pulled • Left alone
K.6D	<p>Observe and describe the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow.</p> <p>Observe, Describe</p> <p>THE WAYS THAT OBJECTS CAN MOVE</p> <p>Including, but not limited to:</p>	1.6D	<p>Demonstrate and record the ways that objects can move such as in a straight line, zigzag, up and down, back and forth, round and round, and fast and slow.</p> <p>Demonstrate, Record</p> <p>THE WAYS THAT OBJECTS CAN MOVE</p> <p>Including, but not limited to:</p>	2.6D	<p>Compare patterns of movement of objects such as sliding, rolling, and spinning.</p> <p>Compare</p> <p>PATTERNS OF MOVEMENT OF OBJECTS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Sliding

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	<ul style="list-style-type: none"> In a straight line Zigzag Up and down Back and forth Round and round Fast and slow 		<ul style="list-style-type: none"> In a straight line Zigzag Up and down Back and forth Round and round Fast and slow 		<ul style="list-style-type: none"> Pushed Pulled Released on a slope Rolling Pushed Pulled Spinning
EARTH AND SPACE					
<i>K.7</i>	<i>Earth and space. The student knows that the natural world includes earth materials. The student is expected to:</i>	<i>1.7</i>	<i>Earth and space. The student knows that the natural world includes rocks, soil, and water that can be observed in cycles, patterns, and systems. The student is expected to:</i>	<i>2.7</i>	<i>Earth and space. The student knows that the natural world includes earth materials. The student is expected to:</i>
K.7A	<p>Observe, describe, compare, and sort rocks by size, shape, color, and texture.</p> <p>Observe, Describe, Compare, Sort</p> <p>ROCKS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> Size Shape Color Texture 			2.7A	<p>Observe and describe rocks by size, texture and color.</p> <p>Observe, Describe</p> <p>ROCKS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> Size Boulders Gravel Sand Color Texture <p>2061 Note: By the end of 2nd grade, the student should know that:</p> <ul style="list-style-type: none"> Chunks of rocks come in many sizes and shapes, from boulders to grains of sand and even smaller. 4C/P1

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		<p>1.7A</p> <p>Observe, compare, describe and sort components of soil by size, texture, and color.</p> <p>Observe, Compare, Sort</p> <p>SOIL</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Size • Texture • Color <p>Describe</p> <p>COMPONENTS OF SOIL</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Air • Water • Organic material • Minerals 			
<p>K.7B</p> <p>Observe and describe physical properties of natural sources of water, including color and clarity.</p> <p>Observe, Describe</p> <p>PHYSICAL PROPERTIES OF NATURAL SOURCES OF WATER</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Properties • Color • Clarity 	<p>1.7B</p> <p>Identify and describe a variety of natural sources of water, including streams, lakes, and oceans.</p> <p>Identify, Describe</p> <p>A VARIETY OF NATURAL SOURCES OF WATER</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Stream • Lake • Ocean 	<p>2.7B</p> <p>Identify and compare the properties of natural sources of freshwater and saltwater.</p> <p>Identify, Compare</p> <p>THE PROPERTIES OF NATURAL SOURCES OF WATER</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Freshwater • Rivers • Lakes 			

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	<ul style="list-style-type: none"> Natural sources Ocean Lake Pond River Stream 		<ul style="list-style-type: none"> Pond River 		<ul style="list-style-type: none"> Ponds Streams Saltwater Ocean
K.7C	<p>Give examples of ways rocks, soil, and water are useful.</p> <p>Give</p> <p>EXAMPLES OF WAYS ROCKS, SOIL, AND WATER ARE USEFUL</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> For recreation At home In the community For a garden 	1.7C	<p>Gather evidence of how rocks, soil, and water help to make useful products.</p> <p>Gather</p> <p>EVIDENCE OF HOW ROCKS, SOIL, AND WATER HELP TO MAKE USEFUL PRODUCTS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> In everyday life Shelter Food Recreation 		
				2.7C	<p>Distinguish between natural and manmade resources.</p> <p>Distinguish</p> <p>BETWEEN NATURAL AND MANMADE RESOURCES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> Natural resources Plants Animals Sunlight

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					<ul style="list-style-type: none"> • Air • Water • Fossil fuels • Manmade resources • Manufactured goods
K.8	<i>Earth and Space. The student knows that there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:</i>	1.8	<i>Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:</i>	2.8	<i>Earth and space. The student knows that there are recognizable patterns in the natural world and among objects in the sky. The student is expected to:</i>
K.8A	<p>Observe and describe weather changes from day to day and over seasons.</p> <p>Observe, Describe</p> <p>WEATHER CHANGES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Types of weather <ul style="list-style-type: none"> • Sunny • Clear • Cloudy • Calm • Windy • Rainy • Snowy • Weather changes over time <ul style="list-style-type: none"> • Seasonal changes • Temperature changes 	1.8A	<p>Record weather information, including relative temperature such as hot or cold, clear or cloudy, calm or windy, and rainy or icy.</p> <p>Record</p> <p>WEATHER INFORMATION</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Relative temperature <ul style="list-style-type: none"> • Hot or cold • Clear or cloudy • Calm or windy • Rainy or icy 	2.8A	<p>Measure, record, and graph weather information, including temperature, wind conditions, precipitation, and cloud coverage in order to identify patterns in the data.</p> <p>Measure, Record, Graph</p> <p>WEATHER INFORMATION IN ORDER TO IDENTIFY PATTERNS IN THE DATA</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Changes in weather <ul style="list-style-type: none"> • Temperature • Wind conditions • Precipitation • Cloud coverage • Patterns in weather <p>2061 Note: By the end of 2nd grade, the student should know that:</p> <ul style="list-style-type: none"> • The temperature and amount of rain (or snow) tend to be high, low, or medium in the same months every year. 4B/P1*

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K.8B	<p>Identify events that have repeating patterns, including seasons of the year and day and night.</p> <p>Identify</p> <p>EVENTS THAT HAVE REPEATING PATTERNS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Seasons of the year • Day and night 	1.8C	<p>Identify characteristics of the seasons of the year and day and night.</p> <p>Identify</p> <p>CHARACTERISTICS</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Seasons of the year • Changes in temperature • Changes in plants • Day and night 	2.8B	<p>Identify the importance of weather and seasonal information to make choices in clothing, activities, and transportation.</p> <p>Identify</p> <p>IMPORTANCE OF WEATHER AND SEASONAL INFORMATION TO MAKE CHOICES</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Clothing • Activities • Transportation
K.8C	<p>Observe, describe, and illustrate objects in the sky such as the clouds, Moon, and stars, including the Sun.</p> <p>Observe, Describe, Illustrate</p> <p>OBJECTS IN THE SKY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Clouds • Moon • Stars (Sun) 	1.8B	<p>Observe and record changes in the appearance of objects in the sky such as clouds, the Moon, and stars, including the Sun.</p> <p>Observe, Record</p> <p>CHANGES IN THE APPEARANCE OF OBJECTS IN THE SKY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Clouds • Moon • Stars (Sun) 	2.8D	<p>Observe, describe, and record patterns of objects in the sky, including the appearance of the Moon.</p> <p>Observe, Describe, Record</p> <p>PATTERNS OF OBJECTS IN THE SKY</p> <p>Including, but not limited to:</p> <ul style="list-style-type: none"> • Appearance of the Moon • Patterns of stars • Apparent movement of the Sun's position in the sky

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