

<p style="text-align: center;"><b>Pre-Kindergarten</b>  <b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b>                      Patterns and functional relationships can be represented and analyzed using                      a variety of strategies, tools, and technology.</p>		
<p style="text-align: center;"><b>How do patterns and functions help us describe data and physical                      phenomena and solve a variety of problems?</b></p>		
Students should...	Performance Standards	Expected Performances
1.1 <u><b>Understand</b></u> and <u><b>Describe</b></u> <ul style="list-style-type: none"> <li>• patterns</li> <li>• functional relationships</li> </ul>	a. <u><b>Sort</b></u> and <u><b>Classify</b></u> objects by an attribute.	(1) <u><b>Sort</b></u> and <u><b>Classify</b></u> objects <ul style="list-style-type: none"> <li>• by a single attribute (size, shape, color)</li> <li>• by texture,</li> <li>• by orientation and</li> <li>• by position and <u><b>Describe</b></u> the reason.</li> </ul> (2) Describe qualitative changes such as <ul style="list-style-type: none"> <li>• hotter,</li> <li>• cooler, or</li> <li>• taller.</li> </ul>
	b. <u><b>Describe patterns</b></u> and <u><b>Extend patterns</b></u> using the attributes of various objects.	(1) <u><b>Recognize, Copy, Extend,</b></u> and <u><b>Create</b></u> simple <ul style="list-style-type: none"> <li>• auditory patterns                             <ul style="list-style-type: none"> <li>○ using a variety of materials</li> <li>○ in different contexts</li> </ul> </li> <li>• physical patterns                             <ul style="list-style-type: none"> <li>○ using a variety of materials</li> <li>○ in different contexts</li> </ul> </li> </ul>

<p style="text-align: center;"><b>Kindergarten</b>  <b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b>                      Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.</p>		
<p style="text-align: center;"><b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b></p>		
Students should...	Performance Standards	Expected Performances
<p>1.1  <b><u>Understand</u></b> and  <b><u>Describe</u></b></p> <ul style="list-style-type: none"> <li>• patterns</li> <li>• functional relationships</li> </ul>	<p>a. <b><u>Sort</u></b> and <b><u>Classify</u></b> objects using attributes.</p>	<p><b>(1) <u>Sort</u></b> and <b><u>Classify</u></b> objects by</p> <ul style="list-style-type: none"> <li>• size,</li> <li>• shape,</li> <li>• color,</li> <li>• texture,</li> <li>• use,</li> <li>• position and</li> <li>• orientation</li> </ul> <p>and <b><u>describe</u></b> the reason.</p>
	<p>b. <b><u>Identify</u></b> a pattern and <b><u>Describe</u></b> the rule of the pattern</p> <ul style="list-style-type: none"> <li>• using the <b><u>physical attributes</u></b> of objects in a sequence or</li> <li>• using the <b><u>position</u></b> of objects in a sequence.</li> </ul>	<p><b>(1) <u>Recognize, Copy</u></b> and <b><u>Extend</u></b> patterns of</p> <ul style="list-style-type: none"> <li>• sounds in a variety of contexts,</li> <li>• colors in a variety of contexts,</li> <li>• shapes in a variety of contexts,</li> <li>• textures in a variety of contexts and</li> <li>• numbers in a variety of contexts</li> </ul> <p>and <b><u>Describe</u></b> the rule of the pattern.</p> <p><b>(2) <u>Make</u></b> comparisons of a given pattern and <b><u>Describe</u></b> qualitative and quantitative changes of a given pattern</p> <ul style="list-style-type: none"> <li>• (more,</li> <li>• less,</li> <li>• bigger,</li> <li>• smaller,</li> <li>• longer,</li> <li>• one more,</li> <li>• one less).</li> </ul>

<b>Grade 1</b> <b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b> Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.		
<b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b>		
Students should...	Performance Standards	Expected Performances
1.1 <b><u>Understand</u></b> and <b><u>Describe</u></b> <ul style="list-style-type: none"> <li>• patterns</li> <li>• functional relationships</li> </ul>	a. <b><u>Examine</u></b> attributes of objects and  <b><u>Describe</u></b> the relationships.	(1) <b><u>Sort, Classify</u></b> and <b><u>Order</u></b> <ul style="list-style-type: none"> <li>• objects based on one and two attributes and</li> <li>• numbers based on one and two attributes</li> </ul> and <b><u>Describe</u></b> the rule used. (2) <b><u>Recognize, Extend, Describe</u></b> and <b><u>Create</u></b> a variety of patterns, and <b><u>Translate</u></b> the same pattern <ul style="list-style-type: none"> <li>• from one representation (such as color)</li> <li>• to another representation (such as shape).</li> </ul> (3) <b><u>Describe</u></b> <ul style="list-style-type: none"> <li>• counting patterns and</li> <li>• number patterns.</li> </ul> (4) <b><u>Develop</u></b> and <b><u>Test</u></b> generalizations based on observations of <ul style="list-style-type: none"> <li>• patterns and</li> <li>• relationships.</li> </ul>
1.2 <b><u>Represent</u></b> and <b><u>Analyze</u></b> quantitative relationships in a variety of ways.	a. Represent the result of <ul style="list-style-type: none"> <li>• counting,</li> <li>• combining and</li> <li>• separating sets of objects using number sentences.</li> </ul>	(1) Model real life situations that involve <b><u>addition</u></b> of whole numbers using <ul style="list-style-type: none"> <li>• objects,</li> <li>• pictures and</li> <li>• open sentences.</li> </ul> Model real life situations that involve <b><u>subtraction</u></b> of whole numbers using <ul style="list-style-type: none"> <li>• objects,</li> <li>• pictures and</li> <li>• open sentences.</li> </ul>
1.3 <b><u>Use operations, Use properties</u></b> and <b><u>Use algebraic symbols</u></b> <ul style="list-style-type: none"> <li>• to determine equivalence and</li> <li>• to solve problems.</li> </ul>	a. Identify quantities as <ul style="list-style-type: none"> <li>• equivalent or</li> <li>• non-equivalent.</li> </ul>	(1) <b><u>Demonstrate balance</u></b> using models or <b><u>Demonstrate equivalence</u></b> using models.

<b>Grade 2</b> <b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b> Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.		
<b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b>		
Students should...	Performance Standards	Expected Performances
1.1 <b><u>Understand</u></b> and <b><u>Describe</u></b> <ul style="list-style-type: none"> <li>• patterns</li> <li>• functional relationships</li> </ul>	a. <b><u>Describe</u></b> and <b><u>Extend</u></b> patterns.	(1) <b><u>Describe</u></b> and <b><u>Classify</u></b> <ul style="list-style-type: none"> <li>• data based on more than one attribute and</li> <li>• objects based on more than one attribute.</li> </ul> (2) <b><u>Use patterns</u></b> and <b><u>Use the rules</u></b> that describe them to identify <ul style="list-style-type: none"> <li>• a missing object,</li> <li>• objects with common attributes or</li> <li>• objects with different attributes, and</li> <li>• the complement of a set of objects.</li> </ul> (3) <b><u>Explore</u></b> a variety of ways to <ul style="list-style-type: none"> <li>• describe rules for patterns and</li> <li>• write rules for patterns.</li> </ul>
	b. Analyze change in terms of <ul style="list-style-type: none"> <li>• <b><u>quantity</u></b> using patterns and</li> <li>• <b><u>quality</u></b> using patterns.</li> </ul>	(1) <b><u>Explore</u></b> and <b><u>describe</u></b> number patterns including <ul style="list-style-type: none"> <li>• odd and even numbers,</li> <li>• counting <b>by</b> 2s, 5s, 10s, 100s and</li> <li>• counting <b>on</b> by 10.</li> </ul> (2) <b><u>Make</u></b> comparisons of data <ul style="list-style-type: none"> <li>• using qualitative descriptions</li> <li>• using quantitative descriptions</li> </ul> and <b><u>analyze</u></b> observable changes <ul style="list-style-type: none"> <li>• using qualitative descriptions and</li> <li>• quantitative descriptions.</li> </ul>
1.2 <b><u>Represent</u></b> and <b><u>Analyze</u></b> quantitative relationships in a variety of ways.	a. Represent real-life situations using number sentences.	(1) Model situations involving <b><u>addition</u></b> of whole numbers and <b><u>subtraction</u></b> of whole numbers using <ul style="list-style-type: none"> <li>• objects,</li> <li>• pictures,</li> <li>• symbols and</li> <li>• open sentences.</li> </ul>

**Grade 2**

**ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS**

Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.

**How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?**

Students should...	Performance Standards	Expected Performances
<p>1.3 <b><u>Use operations</u></b>, <b><u>Use properties</u></b> and <b><u>Use algebraic symbols</u></b></p> <ul style="list-style-type: none"> <li>• to determine equivalence and</li> <li>• to solve problems.</li> </ul>	<p>a. Represent quantities that have the same value with an equal sign.</p>	<p><b>(1)</b> Demonstrate understanding of the = sign as an equality symbol.</p>

<b>Grade 3 - ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b> Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.		
<b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b>		
Students should...	Performance Standards	Expected Performances
1.1 <b><u>Understand</u></b> and <b><u>Describe</u></b> <ul style="list-style-type: none"> <li>• patterns</li> <li>• functional relationships</li> </ul>	a. <b><u>Create patterns</u></b> and <b><u>Describe patterns</u></b> using different <ul style="list-style-type: none"> <li>• objects and</li> <li>• symbols.</li> </ul>	(1) Use a variety of materials to <ul style="list-style-type: none"> <li>• <b><u>construct</u></b> numerical patterns and spatial patterns,</li> <li>• <b><u>reproduce</u></b> numerical patterns and spatial patterns</li> <li>• <b><u>describe</u></b> numerical patterns and spatial patterns</li> <li>• <b><u>extend</u></b> numerical patterns and spatial patterns.</li> </ul> (2) <b><u>Explore</u></b> and <b><u>describe</u></b> patterns using <ul style="list-style-type: none"> <li>• tables,</li> <li>• graphs and</li> <li>• charts.</li> </ul> <b><u>Explore</u></b> and <b><u>describe</u></b> sequences using <ul style="list-style-type: none"> <li>• tables,</li> <li>• graphs and</li> <li>• charts.</li> </ul> (3) <b><u>Sort</u></b> and <b><u>classify</u></b> the same set of objects <ul style="list-style-type: none"> <li>• in more than one way and</li> </ul> <b><u>Explain</u></b> the reason for each sort.
1.2 <b><u>Represent</u></b> and <b><u>Analyze</u></b> quantitative relationships in a variety of ways.	a. Identify mathematical relationships as equations.	(1) <b><u>Model</u></b> situations that reflect mathematical relationships involving <ul style="list-style-type: none"> <li>• addition as open sentences,</li> <li>• subtraction as open sentences,</li> <li>• multiplication as open sentences and</li> <li>• division as open number sentences</li> </ul> and <b><u>Match</u></b> to story problems.
1.3 <b><u>Use operations, Use properties</u></b> and <b><u>Use algebraic symbols</u></b> <ul style="list-style-type: none"> <li>• to determine equivalence and</li> <li>• to solve problems.</li> </ul>	a. Represent quantities that have the same value with an equal sign.	(1) <b><u>Demonstrate</u></b> understanding of the = sign as an equality symbol. <b><u>Explore</u></b> inequalities. <b><u>Explore</u></b> the ≠ symbol. (2) Demonstrate equivalence using the <ul style="list-style-type: none"> <li>• commutative properties of whole numbers.</li> <li>• associative properties of whole numbers</li> </ul>

<p style="text-align: center;"><b>Grade 4</b></p> <p style="text-align: center;"><b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b></p> <p style="text-align: center;">Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.</p>		
<p style="text-align: center;"><b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b></p>		
Students Should...	Performance Standards	Expected Performances
<p>1.1 <b><u>Understand</u></b> and <b><u>Describe</u></b></p> <ul style="list-style-type: none"> <li>• patterns</li> <li>• functional relationships.</li> </ul>	<p>a. Classify patterns as</p> <ul style="list-style-type: none"> <li>• repeating or</li> <li>• growing.</li> </ul>	<p><b>(1)</b> Recognize a variety of</p> <ul style="list-style-type: none"> <li>• patterns and</li> <li>• trends</li> <li>• including repeating patterns and</li> <li>• including growing patterns.</li> </ul> <p><b>(2)</b> Explore extending</p> <ul style="list-style-type: none"> <li>• arithmetic sequences</li> <li>• geometric sequences.</li> </ul> <p>Explore comparing</p> <ul style="list-style-type: none"> <li>• arithmetic sequences</li> <li>• geometric sequences</li> </ul> <p><b>(3)</b> Develop generalizations of</p> <ul style="list-style-type: none"> <li>• patterns and</li> <li>• relationships.</li> </ul> <p>Test generalizations of</p> <ul style="list-style-type: none"> <li>• patterns</li> <li>• relationships</li> </ul>
<p>1.2 <b><u>Represent</u></b> and <b><u>Analyze</u></b> quantitative relationships in a variety of ways.</p>	<p>a. Demonstrate the equivalence of both sides of an equation.</p>	<p><b>(1)</b> Use equations to</p> <ul style="list-style-type: none"> <li>• describe the rules for number patterns and</li> <li>• to model word problems.</li> </ul> <p><b>(2)</b> Demonstrate equivalence with the</p> <ul style="list-style-type: none"> <li>• commutative property of whole numbers</li> <li>• associative property of whole numbers</li> <li>• distributive property of whole numbers.</li> </ul>

**Grade 4**

**ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS**

Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.

**How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?**

Students Should...	Performance Standards	Expected Performances
<p>1.3 <u>Use operations</u>, <u>Use properties</u> and <u>Use algebraic symbols</u></p> <ul style="list-style-type: none"> <li>• to determine equivalence and</li> <li>• to solve problems.</li> </ul>	<p>a. Represent possible values using symbols.</p>	<p><b>(1)</b> Use variables to represent quantities in</p> <ul style="list-style-type: none"> <li>• expressions and</li> <li>• number sentences.</li> </ul>

<p style="text-align: center;"><b>Grade 5</b>  <b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b>                      Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.</p>		
<p style="text-align: center;"><b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b></p>		
Students should...	Performance Standards	Expected Performances
<p>1.1 <b><u>Understand</u></b> and <b><u>Describe</u></b></p> <ul style="list-style-type: none"> <li>• patterns and</li> <li>• functional relationships.</li> </ul>	<p>a. <b><u>Identify trends</u></b> and <b><u>Make predictions</u></b> based upon</p> <ul style="list-style-type: none"> <li>• patterns displayed in different formats and</li> <li>• data displayed in different formats.</li> </ul>	<p>(1) <b><u>Extend</u></b> and <b><u>Compare</u></b></p> <ul style="list-style-type: none"> <li>• arithmetic sequences and</li> <li>• geometric sequences.</li> </ul> <p>(2) <b><u>Represent geometric patterns</u></b> and <b><u>Represent numeric patterns</u></b> using</p> <ul style="list-style-type: none"> <li>• words,</li> <li>• tables,</li> <li>• graphs and</li> <li>• equations.</li> </ul> <p>(3) <b><u>Analyze patterns</u></b> and <b><u>Analyze data</u></b> to make</p> <ul style="list-style-type: none"> <li>• generalizations and</li> <li>• predictions.</li> </ul>
<p>1.2 <b><u>Represent</u></b> and <b><u>Analyze</u></b> quantitative relationships in a variety of ways.</p>	<p>a. Recognize that a change in one variable may relate to a change in another variable.</p>	<p>(1) Describe how a change in one variable relates to a change in a second variable <b>in context</b>.</p>
<p>1.3 <b><u>Use operations</u></b>, <b><u>Use properties</u></b> and <b><u>Use algebraic symbols</u></b></p> <ul style="list-style-type: none"> <li>• to determine equivalence and</li> <li>• to solve problems.</li> </ul>	<p>a. Describe the general relationship between two sets of data</p> <ul style="list-style-type: none"> <li>• using an equation or</li> <li>• using an inequality.</li> </ul>	<p>(1) Represent mathematical relationships using <b><u>variables</u></b> in</p> <ul style="list-style-type: none"> <li>• expressions,</li> <li>• equations and</li> <li>• inequalities.</li> </ul> <p>(2) <b><u>Model</u></b> and <b><u>solve</u></b> one step equations using materials that model equivalence.</p>

<p style="text-align: center;"><b>Grade 6</b></p> <p style="text-align: center;"><b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b></p> <p style="text-align: center;">Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.</p>		
<p style="text-align: center;"><b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b></p>		
Students should...	Performance Standards	Expected Performances
<p>1.1 <b><u>Understand</u></b> and <b><u>Describe</u></b></p> <ul style="list-style-type: none"> <li>• patterns and</li> <li>• functional relationships.</li> </ul>	<p>a. Identify relationships through the use of patterns.</p> <p>Make generalizations through the use of patterns.</p>	<p><b>(1) <u>Describe, analyze,</u></b> and <b><u>extend</u></b></p> <ul style="list-style-type: none"> <li>• numeric patterns</li> <li>• geometric patterns and</li> <li>• statistical patterns.</li> </ul> <p><b><u>Use numeric patterns</u></b> and <b><u>Use geometric patterns</u></b> and <b><u>Use statistical patterns</u></b></p> <ul style="list-style-type: none"> <li>• to identify trends and</li> <li>• to justify predictions.</li> </ul>
<p>1.2 <b><u>Represent</u></b> and <b><u>Analyze</u></b> quantitative relationships in a variety of ways.</p>	<p>a. Solve real world problems using algebraic methods.</p>	<p><b>(1)</b> Use variables</p> <ul style="list-style-type: none"> <li>• as placeholders,</li> <li>• to denote a pattern,</li> <li>• to write a formula</li> <li>• to represent a function</li> <li>• to represent a relation.</li> </ul> <p><b>(2)</b> Evaluate algebraic expressions using substitution.</p> <p>Evaluate formulas using substitution.</p>
<p>1.3 <b><u>Use operations,</u></b> <b><u>Use properties</u></b> and <b><u>Use algebraic symbols</u></b></p> <ul style="list-style-type: none"> <li>• to determine equivalence and</li> <li>• to solve problems.</li> </ul>	<p>b. Demonstrate how to maintain equivalence in equations.</p>	<p><b>(1) <u>Model</u></b> and <b><u>Solve</u></b> one-step linear equations by maintaining equivalence.</p>

<b>Grade 7</b> <b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b> Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.		
<b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b>		
Students should...	Performance Standards	Expected Performances
1.1 <b><u>Understand</u></b> and <b><u>Describe</u></b> <ul style="list-style-type: none"> <li>• patterns and</li> <li>• functional relationships.</li> </ul>	a. <b><u>Analyze physical phenomena</u></b> and <b><u>Analyze patterns</u></b> <ul style="list-style-type: none"> <li>• to identify relationships and</li> <li>• to make generalizations.</li> </ul>	<b>(1) <u>Generalize mathematical situations</u></b> and <b><u>Generalize patterns</u></b> with <ul style="list-style-type: none"> <li>• algebraic expressions,</li> <li>• equations and</li> <li>• inequalities.</li> </ul> <b>(2) <u>Identify</u></b> , in a given situation, the <ul style="list-style-type: none"> <li>• independent variables in a given situation and</li> <li>• dependent variables in a given situation.</li> </ul> <b>(3) <u>Recognize</u></b> and <b><u>explain</u></b> when a graph <ul style="list-style-type: none"> <li>• should be continuous or</li> <li>• should be a discrete set of points.</li> </ul>
1.2 <b><u>Represent</u></b> and <b><u>Analyze</u></b> quantitative relationships in a variety of ways.	a. <b><u>Describe</u></b> the affects of characteristics of mathematical relationships on the way the relationship is represented.	<b>(1) <u>Use</u></b> <ul style="list-style-type: none"> <li>• graphs,</li> <li>• tables,</li> <li>• equations, and</li> <li>• verbal descriptions</li> </ul> to <b><u>represent changes</u></b> and to <b><u>analyze changes</u></b> <ul style="list-style-type: none"> <li>• in linear relationships and</li> <li>• in nonlinear relationships.</li> </ul> <b>(2) Recognize</b> that a linear relationship has a constant rate of change.
1.3 <b><u>Use operations</u></b> , <b><u>Use properties</u></b> , & <b><u>Use algebraic symbols</u></b> <ul style="list-style-type: none"> <li>• to determine equivalence and</li> <li>• to solve problems.</li> </ul>	a. <b><u>Solve problems</u></b> using a variety of algebraic methods.	<b>(1) Solve problems</b> using <ul style="list-style-type: none"> <li>• concrete representations,</li> <li>• verbal representations,</li> <li>• symbolic representations,</li> <li>• graphical representations and</li> <li>• tabular representations.</li> </ul>
	b. <b><u>Maintain equivalence in equations</u></b> to determine solutions.	<b>(1) <u>Model</u></b> and <b><u>solve</u></b> <ul style="list-style-type: none"> <li>• one-step linear equations using a variety of methods and</li> <li>• two-step linear equations using a variety of methods.</li> </ul>

<b>Grade 8</b> <b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b> Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.		
<b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b>		
Students should...	Performance Standards	Expected Performances
1.1 <b><u>Understand</u></b> and <b><u>Describe</u></b> <ul style="list-style-type: none"> <li>• patterns and</li> <li>• functional relationships.</li> </ul>	a. Analyze <ul style="list-style-type: none"> <li>• physical phenomena,</li> <li>• functions and</li> <li>• patterns</li> </ul> to <b><u>identify relationships</u></b> and to <b><u>make generalizations</u></b> .	<b>(1)</b> Write recursive functions to generalize patterns. Write explicit functions to generalize patterns. <b>(2)</b> Identify relationships that are linear. Identify relationships that are nonlinear. <b><u>Compare</u></b> and <b><u>contrast</u></b> the properties of linear relationships using <ul style="list-style-type: none"> <li>• tables,</li> <li>• graphs,</li> <li>• equations and</li> <li>• verbal descriptions.</li> </ul> <b><u>Compare</u></b> and <b><u>Contrast</u></b> the properties of nonlinear relationships using <ul style="list-style-type: none"> <li>• tables,</li> <li>• graphs,</li> <li>• equations and</li> <li>• verbal descriptions.</li> </ul> <b>(3)</b> <b><u>Recognize</u></b> and <b><u>Solve</u></b> problems of direct variation.
<b>Grade 8 Continued on Next Page</b>		

<p style="text-align: center;"><b>Grade 8</b></p> <p style="text-align: center;"><b>ALGEBRAIC REASONING: PATTERNS AND FUNCTIONS</b></p> <p style="text-align: center;">Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technology.</p>		
<p style="text-align: center;"><b>How do patterns and functions help us describe data and physical phenomena and solve a variety of problems?</b></p>		
Students should...	Performance Standards	Expected Performances
<p>1.2 <b><u>Represent</u></b> and <b><u>Analyze</u></b> quantitative relationships in a variety of ways.</p>	<p>a. Describe the affects of characteristics of linear relationships on the way the relationship is represented</p> <ul style="list-style-type: none"> <li>• verbally,</li> <li>• in tables,</li> <li>• in graphs, and</li> <li>• in equations.</li> </ul>	<p><b>(1) <u>Determine</u></b> the constant rate of change in a linear relationship and <b><u>Recognize</u></b> this as the slope of a line.</p> <p><b>(2) <u>Compare</u></b> and <b><u>contrast</u></b> the graphs of lines with the same slope <b><u>verses</u></b> those with different slopes.</p> <p><b>(3) <u>Interpret slope</u></b> and <b><u>Interpret y-intercepts</u></b></p> <ul style="list-style-type: none"> <li>• from contextual situations,</li> <li>• from graphs, and</li> <li>• from linear equations.</li> </ul> <p><b>(4)</b> Given two linear relationships in context, recognize that they may have a common solution.</p>
<p>1.3 <b><u>Use operations</u></b>, <b><u>Use properties</u></b>, &amp; <b><u>Use algebraic symbols</u></b></p> <ul style="list-style-type: none"> <li>• to determine equivalence and</li> <li>• to solve problems.</li> </ul>	<p>a. Solve problems using various algebraic</p> <ul style="list-style-type: none"> <li>• methods and</li> <li>• properties.</li> </ul>	<p><b>(1)</b> Solve multi-step equations using algebraic properties.</p> <p><b>(2) <u>Use tables</u></b>, and <b><u>Use graphs</u></b> and <b><u>Use equations</u></b></p> <ul style="list-style-type: none"> <li>• to represent mathematical relationships and</li> <li>• to solve real-world problems.</li> </ul>