



## Math: Reasoning

**Competency:** Justifying and connecting patterns, methods, and thinking.

### Grade Level Competency: Kindergarten

Students will make connections between basic patterns and relationships to justify problem solving decisions and their solutions.

Criteria	Extending	Proficient	In Progress	Beginning
<b>Justification</b>	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can justify my process and support my solution to a problem.	I can apply the skills to solve a problem.	I am developing my understanding of the skills needed to explain my thinking.
<b>Patterns and Relationships</b>		I can analyze and transfer patterns and relationships to new problems and situations.	I can identify a pattern or relationship.	I am acquiring an understanding of numbers, patterns, and relationships.

### MDE grade level benchmarks embedded explicitly in the rubric

#### Kindergarten

K.2.1.1 Identify, create, complete, and extend simple patterns using shape, color, size, number, sounds and movements. Patterns may be repeating, growing or shrinking such as ABB, ABB, ABB or ●,●●,●●●.

**Competency:** Justifying and connecting patterns, methods, and thinking.

Grade Level Competency: Grades 1-2				
Students will make connections between basic patterns and relationships to justify problem solving decisions and their solutions.				
Criteria	Extending	Proficient	In Progress	Beginning
<b>Justification</b>	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can justify my process and support my solution to a problem. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I can apply the skills to solve a problem. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I am developing my understanding of the skills needed to explain my thinking. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2
<b>Patterns and Relationships</b>		I can analyze and transfer patterns and relationships to new problems and situations. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I can identify a pattern or relationship. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2	I am acquiring an understanding of numbers, patterns, and relationships. <input type="checkbox"/> Grade 1 <input type="checkbox"/> Grade 2
MDE grade level benchmarks embedded explicitly in the rubric				
<b>Grade 1</b> 1.2.1.1 Create simple patterns using objects, pictures, numbers and rules. Identify possible rules to complete or extend patterns. Patterns may be repeating, growing, or shrinking. Calculators can be used to create and explore patterns.		<b>Grade 2</b> 2.2.1.1 Identify, create and describe simple number patterns involving repeated addition or subtraction, skip counting and arrays of objects such as counters or tiles. Use patterns to solve problems in various contexts.		



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### Grade Level Competency: Grades 3-4

Students will make connections between basic patterns and relationships to justify problem solving decisions and their solutions.

Criteria	Extending	Proficient	In Progress	Beginning
<b>Justification</b>	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can use mathematical evidence to justify my solutions.  <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I can determine and explain why my solution is reasonable using mathematical evidence to solve familiar situations.  <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I am acquiring the skills needed to explain my mathematical thinking.  <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4
<b>Patterns and Relationships</b>		I can apply and transfer basic patterns and use the relationships to generalize a process that works for new problems and situations.  <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I can describe and extend a pattern.  <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4	I can identify a pattern.  <input type="checkbox"/> Grade 3 <input type="checkbox"/> Grade 4



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**Competency:** Justifying and connecting patterns, methods, and thinking.

Grade Level Competency: Grades 5-6: Students will make sense of patterns and relationships as mathematical evidence to justify their solutions.				
Criteria	Extending	Proficient	In Progress	Beginning
<b>Justification</b>	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can justify and verify my answer by referencing mathematical evidence.  <input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6	I can use a given strategy to show evidence to a problem.  <input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6	I can identify a strategy and show a solution.  <input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6
<b>Patterns and Relationships</b>		I can transfer prior knowledge of patterns and relationships to make connections to new problems and situations.  <input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6	I can describe and extend patterns and relationships to make connections to familiar situations.  <input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6	I can identify patterns.  <input type="checkbox"/> Grade 5 <input type="checkbox"/> Grade 6

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### Grade Level Competency: Grades 7-8

Students will make sense of patterns and relationships as mathematical evidence to justify their solutions.

Criteria	Extending	Proficient	In Progress	Beginning
<b>Justification</b>	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	<p>I can use relevant mathematical evidence to justify my solution is correct in a way that makes sense to others. I can verify the solution using additional strategies.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I can use mathematical evidence to show my solution and justify my solution is correct by applying a strategy.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I can use a given strategy to show evidence to a problem.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>
<b>Patterns and Relationships</b>		<p>I can transfer prior knowledge of patterns and relationships to make predictions and connections to new problems and situations.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I can describe and extend patterns and relationships to make connections to familiar situations.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>	<p>I can identify patterns.</p> <p><input type="checkbox"/> Grade 7 <input type="checkbox"/> Grade 8</p>



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**Competency:** Justifying and connecting patterns, methods, and thinking.

### Grade Level Competency: Grades 9-12

Students will explain connections and generalize increasingly complex patterns and relationships in order to justify and prove solutions.

Criteria	Extending	Proficient	In Progress	Beginning
<b>Justification</b>	A complex performance or application of learning that is transferred to new or novel situations beyond the content area, makes extended or abstract connections to authentic, real-world, multifaceted situations, and/or constructs entirely new ideas that are transformational.	I can use mathematical evidence to justify solutions and prove their accuracy.	I can identify mathematical evidence that leads to a solution. I can assess the reasonableness of my solution.	I can explain my process and find a solution.
<b>Patterns and Relationships</b>		I can analyze, compare, or generalize patterns to make predictions, connections or decisions for a given situation.	I can identify, describe and extend patterns.	I can apply an identified or familiar pattern or relationship.