



National Center and State Collaborative

# **Core Content Connectors: Numbers and Operations 3**

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National Center and State Collaborative

The National Center and State Collaborative (NCSC) is applying the lessons learned from the past decade of research on alternate assessments based on alternate achievement standards (AA-AAS) to develop a multi-state comprehensive assessment system for students with significant cognitive disabilities. The project draws on a strong research base to develop an AA-AAS that is built from the ground up on powerful validity arguments linked to clear learning outcomes and defensible assessment results, to complement the work of the Race to the Top Common State Assessment Program (RTTA) consortia.

Our long-term goal is to ensure that students with significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school ready for post-secondary options. A well-designed summative assessment alone is insufficient to achieve that goal. Thus, NCSC is developing a full system intended to support educators, which includes formative assessment tools and strategies, professional development on appropriate interim uses of data for progress monitoring, and management systems to ease the burdens of administration and documentation. All partners share a commitment to the research-to-practice focus of the project and the development of a comprehensive model of curriculum, instruction, assessment, and supportive professional development. These supports will improve the alignment of the entire system and strengthen the validity of inferences of the system of assessments.



The contents of this entry point draft were developed as part of the National Center and State Collaborative under a grant from the Department of Education (PR/Award #: H373X100002, Project Officer, [Susan.Weigert@Ed.gov](mailto:Susan.Weigert@Ed.gov)). However, the contents do not necessarily represent the policy of the Department of Education and no assumption of endorsement by the Federal government should be made.

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These materials and documents were developed under the National Center and State Collaborative (NCSC) General Supervision Enhancement Grant and are consistent with its goals and foundations. Any changes to these materials are to be consistent with their intended purpose and use as defined by NCSC.

This document is available in alternative formats upon request.

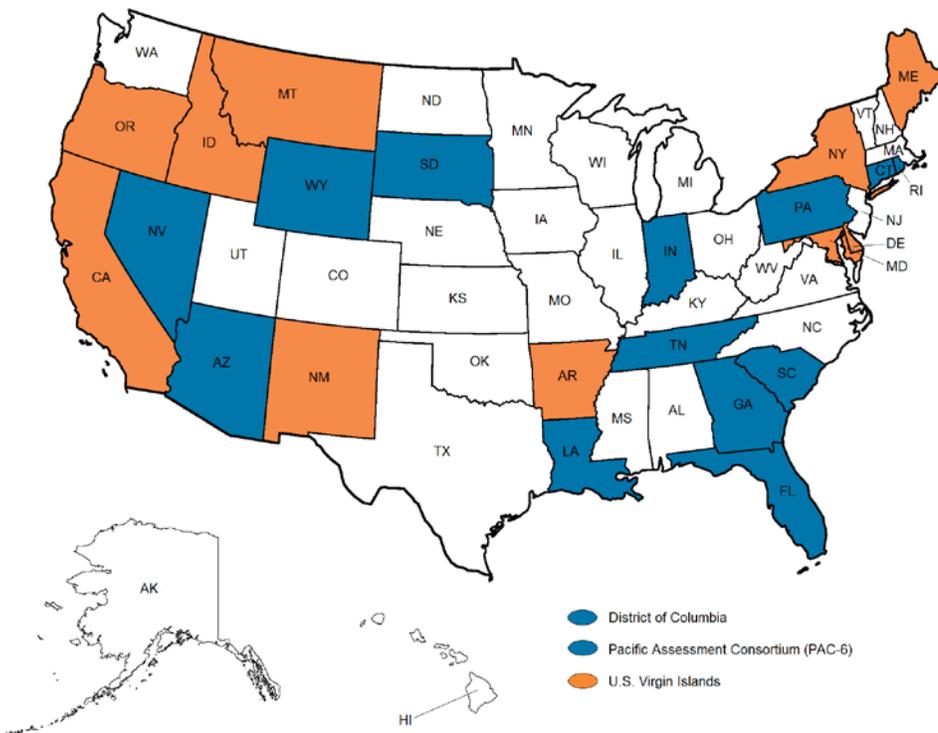


National Center and State Collaborative

NCSC is a collaborative of 15 states and five organizations.

The states include (shown in blue on map): Arizona, Connecticut, District of Columbia, Florida, Georgia, Indiana, Louisiana, Nevada, Pacific Assessment Consortium (PAC-6)<sup>1</sup>, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, and Wyoming.

Tier II states are partners in curriculum, instruction, and professional development implementation but are not part of the assessment development work. They are (shown in orange on map): Arkansas, California, Delaware, Idaho, Maine, Maryland, Montana, New Mexico, New York, Oregon, and U.S. Virgin Islands.



\*Core partner states are blue in color and Tier II states are orange in color.

<sup>1</sup> The Pacific Assessment Consortium (including the entities of American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Guam, Republic of Palau, and Republic of the Marshall Islands) partner with NCSC as one state, led by the University of Guam Center for Excellence in Developmental Disabilities Education, Research, and Service (CEDDERS).



National Center and State Collaborative

The five partner organizations include: The National Center on Educational Outcomes (NCEO) at the University of Minnesota, The National Center for the Improvement of Educational Assessment (Center for Assessment), The University of North Carolina at Charlotte, The University of Kentucky, and edCount, LLC.



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# **Core Content Connectors: Numbers and Operations 3**

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April 2013

	<b>(K-4) Elementary School Learning Targets</b>		<b>(5-8) Middle School Learning Targets</b>		<b>(9-12) High School Learning Targets</b>
	<p><b>E.NO-3</b> Use reasoning to support solutions and informal arguments and to develop metacognitive skills:</p> <ul style="list-style-type: none"> <li>• Use estimation and rounding to support informal arguments;</li> <li>• Develop both additive and multiplicative thinking;</li> <li>• Test, model, and explain solutions.</li> </ul>		<p><b>M.NO-3</b> Develop metacognitive skills through making conjectures and justifying mathematical solutions and arguments:</p> <ul style="list-style-type: none"> <li>• Use estimation and rounding to support reasonableness of arguments/justifications;</li> <li>• Apply multiplicative and proportional reasoning;</li> <li>• Make, test, and justify conjectures using mathematical concepts and models.</li> </ul>		<p><b>H.NO-3</b> Develop metacognitive skills through use of mathematical arguments to justify reasonableness of outcomes, to support formal proofs (including technology applications), and to develop metacognitive skills.</p>
	<b>Grades K-2</b>	<b>Grades 3-4</b>	<b>Grades 5-6</b>	<b>Grades 7-8</b>	<b>HS</b>
<b>Reasoning and Problem Solving</b>	<p><b>1-2.NO.3a1</b> Identify the problem within a word problem (e.g., “Bill had two apples. Sam gave Bill two more apples. How many apples does Bill have now?” – student underlines “How many apples does Bill have now?”)</p>	<p><b>3-4.NO.3c1</b> Solve real world problems (e.g., determine how many nickels needed to be the equivalent of a quarter) by using mental math (such as skip counting by 2s within 20, 5s within 50, 10s within 100)</p>	<p><b>5-6.NO.3a1</b> Justify the use of a strategy, rule, or identified characteristic to solve a given problem (e.g., why use a formula to find the area of rectangles)</p>	<p><b>7-8.NO.3c1</b> Use the rules for mathematical operations to verify the results when more than one operation is required to solve a problem</p>	<p><b>H.NO.3a1</b> Verify data displays are interpreted accurately within a response</p>
	<p><b>1-2.NO.3a2</b> Make sense of and solve story word problems</p>	<p><b>3-4.NO.3d1</b> Use modeling or diagrams to construct or select a viable argument for a given problem (e.g., “what is the difference between equilateral, scalene, and isosceles triangles?” and use models of triangles to illustrate correct answer)</p>	<p><b>5-6.NO.3b1</b> Use up to two rules to extend a pattern and verify provided responses or select correct answers (e.g., Rules: +3, +2 and table lists pairs, 4:5, 7:7, and 10:9)</p>	<p><b>7-8.NO.3c2</b> Explain the selection of rule(s) to use to verify a response</p>	<p><b>H.NO.3a2</b> Rewrite mathematical statements (e.g., an expression) in multiple forms</p>

	<b>(K-4) Elementary School Learning Targets</b>		<b>(5-8) Middle School Learning Targets</b>		<b>(9-12) High School Learning Targets</b>
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	<b>Grades K-2</b>	<b>Grades 3-4</b>	<b>Grades 5-6</b>	<b>Grades 7-8</b>	<b>HS</b>
	<p><b>1-2.NO.3b1</b> Use an appropriate tool to help solve a given problem (e.g., use a ruler to measure in inches)</p>	<p><b>3-4.NO.3d2</b> Use models to find equivalencies or solutions</p>	<p><b>5-6.NO.3b2</b> Explain the selection of rule(s) to use to verify a response Explain the rules used to verify a solution</p>	<p><b>7-8.NO.3c3</b> Analyze provided information (e.g., a graph) to describe the relationship between two quantities</p>	<p><b>H.NO.3a3</b> Identify an appropriate argument based upon provided data</p>
	<p><b>1-2.NO.3b2</b> Use a strategy, rule, or identified characteristic to solve a given routine or non-routine problem (e.g., sort given shapes based upon the rule that triangles have three corners; inches are smaller units than feet so use inches to measure smaller items such as a pencil)</p>	<p><b>3-4.NO.3d3</b> Justify and label solutions as a result of making a comparison (e.g., compare 15 and 25 and label 25 as greater: <math>15 &lt; 25</math>)</p>		<p><b>7-8.NO.3c4</b> Construct an argument using established data and any given pattern within that data</p>	<p><b>H.NO.3a4</b> Compare the steps using different strategies to solve a problem (compare two strategies to decide best way to solve problem)</p>
		<p><b>3-4.NO.3d4</b> Explain why a tool or strategy would be used to solve a given problem</p>		<p><b>7-8.NO.3c5</b> Explain each step to solve a problem (e.g., explain how to solve a multi-step equation)</p>	

	<b>(K-4) Elementary School Learning Targets</b>		<b>(5-8) Middle School Learning Targets</b>		<b>(9-12) High School Learning Targets</b>
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	<b>Grades K-2</b>	<b>Grades 3-4</b>	<b>Grades 5-6</b>	<b>Grades 7-8</b>	<b>HS</b>
<b>Evaluate the reasonableness of answers</b>	1-2.NO.3a3 Use a given strategy to check solutions (e.g., use addition to check an answer to a subtraction problem)	3-4.NO.3c2 Evaluate the reasonableness of answers after making computations	5-6.NO.3b3 Verify provided solutions within word problems (e.g., Sally wanted to give her brother 1/2 of her books. Her brother only took 1/4 of the 1/2 she offered. Sally gave him 1/8 of all of her books. Is this true?)		H.NO.3a5 Evaluate provided arguments or logic based upon provided data
		3-4.NO.3c3 Determine the reasonableness of answers using estimation	5-6.NO.3b4 Critique a set of solutions for a given problem and determine any viable answers		
		3-4.NO.3c4 Determine the reasonableness of answers using arithmetic patterns	5-6.NO.3b5 Evaluate the accuracy of statements made based upon provided data		

## Number and Operations 3 Grade Differentiation

Progress Indicator: E.NO.3a exploring and explaining answers to questions, such as “Does this answer make sense?”		
Core Content Connectors: K- 1 -2	Potential cluster for demonstration	Common Core: <i>Standards for Mathematical Practice</i> <sup>2</sup>
1-2.NO.3a1 Identify the problem within a word problem (e.g., “Bill had two apples. Sam gave Bill two more apples. How many apples does Bill have now?” – student underlines “How many apples does Bill have now?”	1.OA Represent and solve problems involving addition and subtraction	<p>Make sense of problems &amp; persevere in solving them.</p> <p>Reason abstractly &amp; quantitatively.</p> <p>Construct viable arguments and critique the reasoning of others.</p> <p>Model with mathematics.</p> <p>Use appropriate tools strategically.</p> <p>Attend to precision.</p> <p>Look for and make use of structure.</p> <p>Look for and express regularity in repeated reasoning.</p>
1-2.NO.3a2 Make sense of and solve story word problems	2.OA Represent and solve problems involving addition and subtraction	<p>Make sense of problems &amp; persevere in solving them.</p> <p>Reason abstractly &amp; quantitatively.</p> <p>Construct viable arguments and critique the reasoning of others.</p> <p>Model with mathematics.</p> <p>Use appropriate tools strategically.</p> <p>Attend to precision.</p> <p>Look for and make use of structure.</p> <p>Look for and express regularity in repeated reasoning.</p>
1-2.NO.3a3 Use a given strategy to check solutions (e.g., use addition to check an answer to a subtraction problem)	2.NBT Use place value understanding and properties of operations to add and subtract	<p>Make sense of problems &amp; persevere in solving them.</p> <p>Reason abstractly &amp; quantitatively.</p> <p>Construct viable arguments and critique the reasoning of others.</p> <p>Model with mathematics.</p> <p>Use appropriate tools strategically.</p> <p>Attend to precision.</p> <p>Look for and make use of structure.</p> <p>Look for and express regularity in repeated reasoning.</p>
Progress Indicators: E.NO.3b constructing arguments using concrete referents such as objects, diagrams, tables, actions (e.g., clapping, movement) and estimating		
Core Content Connectors: K- 1 -2	Potential cluster for demonstration	Common Core: <i>Standards for Mathematical Practice (p. 6-8 in Mathematics document)</i>
1-2.NO.3b1 Use an appropriate tool to help solve a given problem (e.g.,	2.MD Measure and estimate lengths in standard units	<p>Make sense of problems &amp; persevere in solving</p> <p>Use appropriate tools strategically.</p>

<sup>2</sup> Common Core State Standards for Mathematics (2012). Retrieved from [http://www.corestandards.org/assets/CCSSI\\_Math%20Standards.pdf](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf), p. 6-8.  
Core Content Connectors: Numbers and Operations 3, April 2013

\*It is important to note that this group of CCCs are not intended for the development of instructional lessons or assessment items in isolation.

use a ruler to measure in inches)		them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>1-2.NO.3b2 Use a strategy, rule, or identified characteristic to solve a given routine or non-routine problem (e.g., sort given shapes based upon the rule that triangles have three corners; inches are smaller units than feet so use inches to measure smaller items such as a pencil)</b>	1G Reason with shapes and their attributes	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.

<b>Progress Indicator: E.NO.3c evaluating the reasonableness of answers using mental computation, arithmetic patterns, and estimation strategies, including rounding to the nearest 10 or 100</b>			
<b>Core Content Connectors: 3-4</b>	<b>Potential cluster for demonstration</b>	<b>Common Core: <i>Standards for Mathematical Practice</i><sup>3</sup></b>	
<b>3-4.NO.3c1 Solve real world problems (e.g., determine how many nickels needed to be the equivalent of a quarter) by using mental math (such as skip counting by 2s within 20, 5s within 50, 10s within 100)</b>	4.OA Use the four operations with whole numbers to solve problems	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>3-4.NO.3c2 Evaluate the reasonableness of answers after making computations</b>	3.OA Solve problems involving the 4 operations and identify and explain patterns in arithmetic	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.

<sup>3</sup> Common Core State Standards for Mathematics (2012). Retrieved from [http://www.corestandards.org/assets/CCSSI\\_Math%20Standards.pdf](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf), p. 6-8.  
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		Model with mathematics.	
<b>3-4.NO.3c3 Determine the reasonableness of answers using estimation</b>	3.OA Solve problems involving the 4 operations and identify and explain patterns in arithmetic	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>3-4.NO.3c4 Determine the reasonableness of answers using arithmetic patterns</b>	3.OA Solve problems involving the four operations and identify and explain patterns in arithmetic	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>Progress Indicator: E.NO.3d constructing arguments and explaining reasonableness of outcomes using a variety of concrete supports (e.g., models, diagrams, tables)</b>			
<b>Core Content Connectors: 3-4</b>	<b>Potential cluster for demonstration</b>	<b>Common Core: <i>Standards for Mathematical Practice</i><sup>4</sup></b>	
<b>3-4.NO.3d1 Use modeling or diagrams to construct or select a viable argument for a given problem (e.g., “what is the difference between equilateral, scalene, and isosceles triangles?” and use models of triangles to illustrate correct answer)</b>	3G Reason with shapes and their attributes	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>3-4.NO.3d2 Use models to find equivalencies or solutions</b>	4.NF Extend understanding of fraction equivalence and ordering	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity

<sup>4</sup> Common Core State Standards for Mathematics (2012). Retrieved from [http://www.corestandards.org/assets/CCSSI\\_Math%20Standards.pdf](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf), p. 6-8.  
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		and critique the reasoning of others. Model with mathematics.	in repeated reasoning.
<b>3-4.NO.3d3 Justify and label solutions as a result of making a comparison (e.g., compare 15 and 25 and label 25 as greater: <math>15 &lt; 25</math>)</b>	4NBT Generalize place value understanding for multi-digit whole numbers.	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>3-4.NO.3d4 Explain why a tool or strategy would be used to solve a given problem</b>	3.OA Solve problems involving the four operations, and identify and explain patterns in arithmetic	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>Explanations and clarifications:</b>			

<b>Progress Indicator: M.NO.3a using informal and rule-based arguments, evidence, and examples (e.g., estimation, rounding, arrays, visual models, diagrams) to justify mathematical solutions</b>			
<b>Core Content Connectors: 5-6</b>		<b>Potential cluster for demonstration</b>	
<b>Common Core: <i>Standards for Mathematical Practice</i><sup>5</sup></b>			
<b>5-6.NO.3a1 Justify the use of a strategy, rule, or identified characteristic to solve a given problem (e.g., why use a formula to find the area of rectangles)</b>	6.EE Reason about and solve one-variable equations and inequalities	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.

<sup>5</sup> Common Core State Standards for Mathematics (2012). Retrieved from [http://www.corestandards.org/assets/CCSSI\\_Math%20Standards.pdf](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf), p. 6-8.  
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<b>Progress Indicator: M.NO.3b critiquing the mathematical arguments provided by others</b>			
<b>Core Content Connectors: 5-6</b>	<b>Potential cluster for demonstration</b>	<b>Common Core: <i>Standards for Mathematical Practice</i><sup>6</sup></b>	
<b>5-6.NO.3b1 Use up to two rules to extend a pattern and verify provided responses or select correct answers (e.g., Rules: +3, +2 and table lists pairs, 4:5, 7:7, and 10:9)</b>	5.OA Analyze patterns and relationships	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>5-6.NO.3b2 Explain the selection of rule(s) to use to verify a response Explain the rules used to verify a solution</b>	5.OA Analyze patterns and relationships	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>5-6.NO.3b3 Verify provided solutions within word problems (e.g., Sally wanted to give her brother 1/2 of her books. Her brother only took 1/4 of the 1/2 she offered. Sally gave him 1/8 of all of her books. Is this true?)</b>	6.NS Apply and extend previous understandings of numbers to the system of rational numbers	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>5-6.NO.3b4 Critique a set of solutions for a given problem and determine any viable answers</b>	5.NBT Perform operations with multi-digit whole numbers and with decimals to hundredths	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.

<sup>6</sup> Common Core State Standards for Mathematics (2012). Retrieved from [http://www.corestandards.org/assets/CCSSI\\_Math%20Standards.pdf](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf), p. 6-8.  
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<b>5-6.NO.3b5 Evaluate the accuracy of statements made based upon provided data</b>	6.SP Develop understanding of statistical variability	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
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**Explanations and clarifications:**

<b>Progress Indicator: M.NO.3c using stated assumptions, definitions, patterns, and previously established results in constructing mathematical arguments</b>			
<b>Core Content Connectors: 7-8</b>	<b>Potential cluster for demonstration</b>	<b>Common Core: <i>Standards for Mathematical Practice</i><sup>7</sup></b>	
<b>7-8.NO.3c1 Use the rules for mathematical operations to verify the results when more than one operation is required to solve a problem</b>	7.EE Solve real-life and mathematical problems using numerical and algebraic expressions and equations	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>7-8.NO.3c2 Explain the selection of rule(s) to use to verify a response</b>	7.NS Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning
<b>7-8.NO.3c3 Analyze provided information (e.g., a graph) to describe the relationship between two quantities</b>	7.RP Analyze proportional relationships and use them to solve real-world mathematical problems	Make sense of problems & persevere in solving them. Reason abstractly &	Use appropriate tools strategically. Attend to precision. Look for and make use of

<sup>7</sup> Common Core State Standards for Mathematics (2012). Retrieved from [http://www.corestandards.org/assets/CCSSI\\_Math%20Standards.pdf](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf), p. 6-8.

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		quantitatively. Construct viable arguments and critique the reasoning of others. <b>Model with mathematics.</b>	structure. Look for and express regularity in repeated reasoning.
<b>7-8.NO.3c4 Construct an argument using established data and any given pattern within that data</b>	8.SP Investigate patterns of association in bivariate data	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. <b>Model with mathematics.</b>	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>7-8.NO.3c5 Explain each step to solve a problem (e.g., explain how to solve a multi-step equation)</b>	7.EE Solve real-life and mathematical problems using numerical and algebraic expressions and equations	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. <b>Model with mathematics.</b>	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>Explanations and clarifications:</b> It was decided to not address <b>M.NO.3d making conjectures and building a logical progression of statements to explore the truth of conjectures</b> due to the complex nature of the PI for this population of students.			

<b>Progress Indicator: H.NO.3a comparing the effectiveness of two plausible arguments, distinguishing correct logic or reasoning from that which is flawed, and if there is a flaw in an argument, explaining it</b>			
<b>Core Content Connectors: 9-12</b>	<b>Potential cluster for demonstration</b>	<b>Common Core: <i>Standards for Mathematical Practice</i><sup>8</sup></b>	
<b>H.NO.3a1 Verify data displays are interpreted accurately within a response</b>	S.ID Summarize, represent and interpret data on a single count or measurement variable	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.

<sup>8</sup> Common Core State Standards for Mathematics (2012). Retrieved from [http://www.corestandards.org/assets/CCSSI\\_Math%20Standards.pdf](http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf), p. 6-8.  
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\*It is important to note that this group of CCCs are not intended for the development of instructional lessons or assessment items in isolation.

		reasoning of others. Model with mathematics.	
<b>H.NO.3a2 Rewrite mathematical statements (e.g., an expression) in multiple forms</b>	A.SSE Write expressions in equivalent forms to solve problems	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics. <i>SMPs #2, #7 and #8 fit well here in using reasoning skills to write expressions in equivalent forms.</i>	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>H.NO.3a3 Identify an appropriate argument based upon provided data</b>	S.IC Make inferences and justify conclusions from sample surveys, experiments, and observational studies	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>H.NO.3a4 Compare the steps using different strategies to solve a problem (compare two strategies to decide best way to solve problem)</b>	A.REI Understand solving equations as process of reasoning and explain the reasoning	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others. Model with mathematics.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.
<b>H.NO.3a5 Evaluate provided arguments or logic based upon provided data</b>	S.IC Understand and evaluate random processes underlying statistical experiments	Make sense of problems & persevere in solving them. Reason abstractly & quantitatively. Construct viable arguments and critique the reasoning of others.	Use appropriate tools strategically. Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.

		Model with mathematics.
<b>Explanations and clarifications:</b>		