BRIEF #6: ALABAMA ASSESSMENT TASK FORCE

INTERIM ASSESSMENTS AS PART OF ALABAMA'S NEXT ASSESSMENT SYSTEM

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Creating balanced assessment systems is really hard. There are few examples of well-functioning assessment systems, other than a limited number of research-practice partnerships. Assessment systems are balanced when the various assessments in the system are coherently linked, often through a clear specification of the learning targets, comprehensively support multiple purposes and uses, and continuously document student progress over time. These properties of coherence, continuity, and comprehensiveness originally described in *Knowing What Students Know* (NRC, 2001) help create a powerful image of a high-quality system of assessments. Several assessment experts have argued (e.g., Shepard, et. al., in press; Marion, 2015) that districts are the appropriate organizational level for implementing balanced systems of assessment. States, in general, are too far removed from the classroom to lead the development of balanced assessment systems. However states can still play a role in supporting high-quality assessment systems.

The criteria outlined in *Knowing What Students Know* (NRC, 2001) and further developed by Chattergoon and others (Chattergoon, 2016; Chattergoon & Marion, 2016) are based on visions of "tightly-coupled" systems with information flowing among the various components to maximize efficiency and utility. Recent work on designing assessments to evaluate student learning of the Next Generation Science Standards (NRC, 2014; Marion & Penuel, 2017) has led us to conceptualize "loosely-coupled" systems. Such systems have multiple levels of assessments tied to the same learning targets and vision of learning science to at least partially address the coherence criterion. However, because the information is not shared across levels of the system, such loosely-coupled systems are not as efficient as ones where information from one level (e.g., classroom) is used to support purposes at another level (e.g., accountability).

Several states are beginning to implement such loosely-coupled systems. Both Delaware and Kentucky are implementing multi-component systems to assess student learning of three-dimensional science standards. More relevant to our current work in Alabama, Wyoming and Utah have recently awarded assessment contracts requiring the development of interim assessments explicitly tied to the states' summative assessment in reading and math. The interim assessments in Wyoming are based on a "modular" design whereby interim tests are tied to key subdomains within the standards (e.g., Number-Base 10). Importantly, in both cases, the use of

the interim assessments is optional and districts can administer the specific interim tests when they best fit within the local curriculum (see Appendix A for a detailed explanation of different types of interim assessment designs). While the states acknowledge that these are not fully balanced assessment systems, they are designed to eliminate incoherence between the state summative assessment and the various district-purchased commercial interim assessments. Further, having the state support interim assessments tied to the same specifications as the summative assessment helps to ensure that districts have access to higher quality interim assessments than they often purchase on their own.

As we have been discussing through the task force process, there is no "free lunch." Procuring an interim assessment system along with the summative assessment requires additional capacity at the state level (ALSDE) to monitor the quality of the interim assessments in addition to the critical oversight ALSDE must play on the summative assessment. Additionally, districts might be reluctant to give up their current interim assessments, which could mean that the state-sponsored interim assessments go unused or, worse, districts administer both their own interim assessments as well as the state-sponsored interims leading to over-testing.

Questions to Answer

We would like the Task Force to weigh in on the following questions:

1. Should ALSDE include interim assessments as either a requirement or cost-option in the RFB? If yes, continue with questions 2 and 3.
2. Should the interim assessment be required or optional for districts?
3. Should the state require a mini-summative, modular, or some other design?
    a. If mini-summative, how many times during the year should the test be offered?
    b. If modular, should the modules be tied to individual standards, clusters of standards, and/or major topic areas of the discipline (e.g., proportional reasoning)?

APPENDIX A: MINI-SUMMATIVE VS. MODULAR INTERIM ASSESSMENT DESIGNS

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To help illustrate the differences between a mini-summative and modular design, we present an abbreviated pictorial representation of the two designs below. In a mini-summative design, the interim assessments are in essence, just shorter versions of the summative assessment. In a modular design, the interim assessments focus on specific portions of what was covered by the complete summative assessment to give more fine-grained information about student achievement within the content area of the summative assessment. A more detailed explanation of how this might be accomplished is given on the following pages.

Figure 1. Mini-summative Interim Assessment Design Schematic.

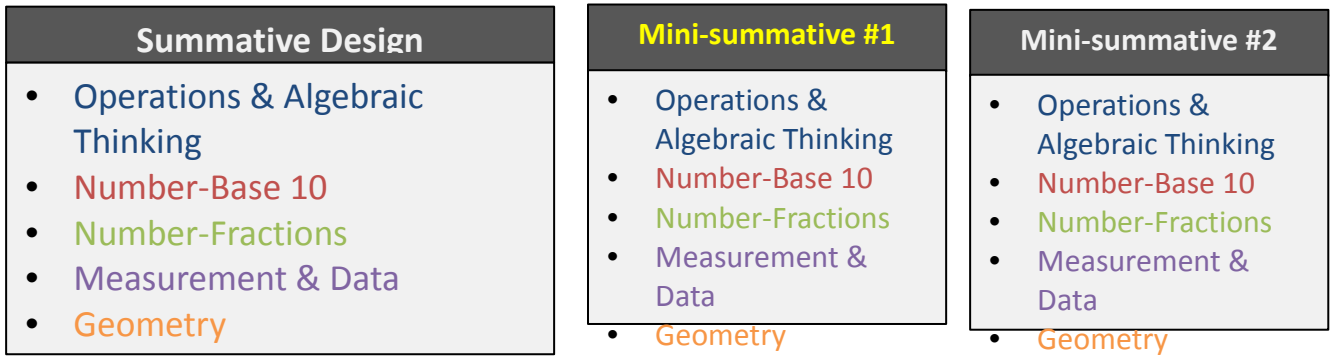
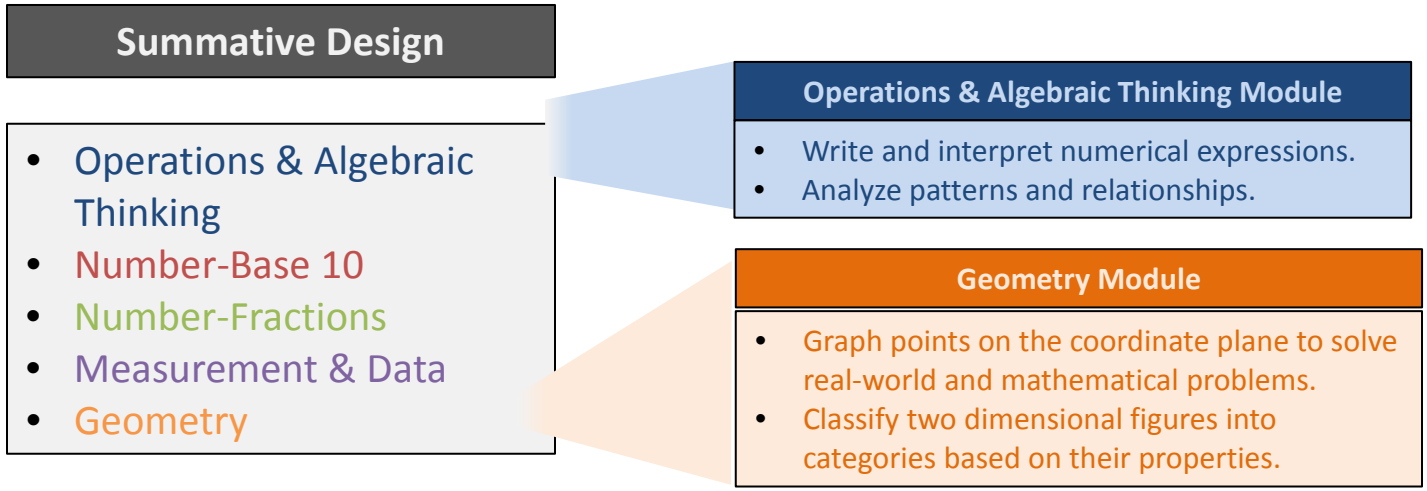


Figure 2. Modular Interim Assessment Design Schematic.



As an aid in further understanding assessment design, we first describe the general hierarchical format that content standards take by providing an example from grade-5 mathematics:

Content Category
Operations & Algebraic Thinking Write and interpret numerical expressions *Use parentheses, brackets, or braces…* *Write simple expressions that record calculations…* Analyze patterns and relationships *Generate…numerical patterns…given rules…*
Number & Operations in Base Ten Understand the place value system *Recognize [digit values increase tenfold when one place… left]* *Explain patterns in…multiplying by powers of 10…* *Read, write, and compare decimals to thousandths* *Use place value understanding to round decimals to any place* Perform operations…to hundredths *Fluently multiple multi-digit whole numbers…* *Find whole-number quotients of whole numbers…* *Add, subtract, multiply, and divide decimals to hundredths.*
Number & Operations—Fractions Use equivalent fractions…to add and subtract fractions *Add and subtract fractions with unlike denominators…* *Solve [fraction word problems by comparison…]* Apply and extend…multiplication and division *Interpret a fraction [as a division problem]…* *[Extend whole number] multiplication to…fractions…* *Interpret multiplication as scaling (resizing)…* *Solve…problems [with] multiplication of fractions…* *[Extend division to involve unit fractions]*
Measurement & Data Convert like measurement units [in the same] system *Convert among different sized measurement units…* Represent and interpret data *Make a line plot to display [data with fractional units]…* Geometric measurement: understand…volume *Understand volume as an attribute of solid figures…* *Measure volumes by counting unit cubes…* *Relate volume to [multiplication and division]…*
Geometry Graph points on the coordinate plane to solve… *Use [two] perpendicular lines…to define a coordinate…* *Represent… points in the first quadrant…* Classify two-dimensional figures…on…properties *[Know category] attributes [apply] to all sub-categories…* *Classify…figures in a hierarchy based on properties*

To aid in explanation, the broadest content categories (at the top of the hierarchy) are displayed in bold. Sub-categories are indented presented in the same color as the broad category they belong to. Sub-sub-categories are further indented and presented in italics.

In a *highly simplified* version of test design, the number of test questions or score points that come from each sub-sub-category is clearly specified to reflect the relative importance of each category. For example, if every sub-sub-category were considered equally important, a reasonable test design might specify that every sub-sub-category be measured using two test questions, resulting in the following hypothetical summative test design:

Content Category	# of Items
Operations & Algebraic Thinking	**6**
Write and interpret numerical expressions	4
Use parentheses, brackets, or braces…	*2*
Write simple expressions that record calculations…	*2*
Analyze patterns and relationships	2
Generate…numerical patterns…given rules…	*2*
Number & Operations in Base Ten	**14**
Understand the place value system	8
Recognize [digit values increase tenfold when one place… left]	*2*
Explain patterns in…multiplying by powers of 10…	*2*
Read, write, and compare decimals to thousandths	*2*
Use place value understanding to round decimals to any place	*2*
Perform operations…to hundredths	6
Fluently multiple multi-digit whole numbers…	*2*
Find whole-number quotients of whole numbers…	*2*
Add, subtract, multiply, and divide decimals to hundredths…	*2*
Number & Operations—Fractions	**14**
Use equivalent fractions…to add and subtract fractions	4
Add and subtract fractions with unlike denominators…	*2*
Solve [fraction word problems by comparison…]	*2*
Apply and extend…multiplication and division	10
Interpret a fraction [as a division problem]…	*2*
[Extend whole number] multiplication to…fractions…	*2*
Interpret multiplication as scaling (resizing)…	*2*
Solve…problems [with] multiplication of fractions…	*2*
[Extend division to involve unit fractions]	*2*
Measurement & Data	**10**
Convert like measurement units [in the same] system	2
Convert among different sized measurement units…	*2*
Represent and interpret data	2
Make a line plot to display [data with fractional units]…	*2*
Geometric measurement: understand…volume	6
Understand volume as an attribute of solid figures…	*2*
Measure volumes by counting unit cubes…	*2*
Relate volume to [multiplication and division]…	*2*
Geometry	**8**
Graph points on the coordinate plane to solve…	4
Use [two] perpendicular lines…to define a coordinate…	*2*
Represent… points in the first quadrant…	*2*
Classify two-dimensional figures…on…properties	4
[Know category] attributes [apply] to all sub-categories…	*2*
Classify…figures in a hierarchy based on properties	*2*
Total	**52**

A *mini-summative interim assessment design* is intended to reasonably replicate the summative assessment experience with the exception of being shorter. For example, on an interim assessment with five testing opportunities, this could be accomplished by measuring each content standard with 1 rather than 2 items, giving the following mini-summative interim assessment design, making each interim assessment half as long as the summative assessment:

Content Category	# of Items on Interim Assessment				
	1	2	3	4	5
Operations & Algebraic Thinking	**3**	**3**	**3**	**3**	**3**
Write and interpret numerical expressions	2	2	2	2	2
Use parentheses, brackets, or braces…	*1*	*1*	*1*	*1*	*1*
Write simple expressions that record calculations…	*1*	*1*	*1*	*1*	*1*
Analyze patterns and relationships	1	1	1	1	1
Generate…numerical patterns…given rules…	*1*	*1*	*1*	*1*	*1*
Number & Operations in Base Ten	**7**	**7**	**7**	**7**	**7**
Understand the place value system	4	4	4	4	4
Recognize [digit values increase tenfold when one place… left]	*1*	*1*	*1*	*1*	*1*
Explain patterns in…multiplying by powers of 10…	*1*	*1*	*1*	*1*	*1*
Read, write, and compare decimals to thousandths	*1*	*1*	*1*	*1*	*1*
Use place value understanding to round decimals to any place	*1*	*1*	*1*	*1*	*1*
Perform operations…to hundredths	3	3	3	3	3
Fluently multiple multi-digit whole numbers…	*1*	*1*	*1*	*1*	*1*
Find whole-number quotients of whole numbers…	*1*	*1*	*1*	*1*	*1*
Add, subtract, multiply, and divide decimals to hundredths…	*1*	*1*	*1*	*1*	*1*
Number & Operations—Fractions	**7**	**7**	**7**	**7**	**7**
Use equivalent fractions…to add and subtract fractions	2	2	2	2	2
Add and subtract fractions with unlike denominators…	*1*	*1*	*1*	*1*	*1*
Solve [fraction word problems by comparison…]	*1*	*1*	*1*	*1*	*1*
Apply and extend…multiplication and division	5	5	5	5	5
Interpret a fraction [as a division problem]…	*1*	*1*	*1*	*1*	*1*
[Extend whole number] multiplication to…fractions…	*1*	*1*	*1*	*1*	*1*
Interpret multiplication as scaling (resizing)…	*1*	*1*	*1*	*1*	*1*
Solve…problems [with] multiplication of fractions…	*1*	*1*	*1*	*1*	*1*
[Extend division to involve unit fractions]	*1*	*1*	*1*	*1*	*1*
Measurement & Data	**5**	**5**	**5**	**5**	**5**
Convert like measurement units [in the same] system	1	1	1	1	1
Convert among different sized measurement units…	*1*	*1*	*1*	*1*	*1*
Represent and interpret data	1	1	1	1	1
Make a line plot to display [data with fractional units]…	*1*	*1*	*1*	*1*	*1*
Geometric measurement: understand…volume	3	3	3	3	3
Understand volume as an attribute of solid figures…	*1*	*1*	*1*	*1*	*1*
Measure volumes by counting unit cubes…	*1*	*1*	*1*	*1*	*1*
Relate volume to [multiplication and division]…	*1*	*1*	*1*	*1*	*1*
Geometry	**4**	**4**	**4**	**4**	**4**
Graph points on the coordinate plane to solve…	2	2	2	2	2
Use [two] perpendicular lines…to define a coordinate…	*1*	*1*	*1*	*1*	*1*
Represent… points in the first quadrant…	*1*	*1*	*1*	*1*	*1*
Classify two-dimensional figures…on…properties	2	2	2	2	2
[Know category] attributes [apply] to all sub-categories…	*1*	*1*	*1*	*1*	*1*
Classify…figures in a hierarchy based on properties	*1*	*1*	*1*	*1*	*1*
Total	**26**	**26**	**26**	**26**	**26**

Multiple interim assessments built to this design would have different sets of test questions, but with the same emphasis on each of the content categories as on the summative assessment.

Modular interim assessment designs are different, however. Modular designs are intended to focus in on strategically selected subsets of the content standards (typically selected to represent potential moderate-sized units of instruction). Therefore, modular interim assessment designs are not similar to the summative test design. For example, in a highly simplified approach, each of the five broadest content categories could be selected as the focus for each of five interim assessment modules, giving the following modular interim assessment design of approximately the same length as the mini-summative designs:

Content Category	# of Items on Interim Assessment				
	1	2	3	4	5
Operations & Algebraic Thinking	**27**				
Write and interpret numerical expressions	18				
Use parentheses, brackets, or braces…	*9*				
Write simple expressions that record calculations…	*9*				
Analyze patterns and relationships	9				
Generate…numerical patterns…given rules…	*9*				
Number & Operations in Base Ten		**28**			
Understand the place value system		16			
Recognize [digit values increase tenfold when one place… left]		*4*			
Explain patterns in…multiplying by powers of 10…		*4*			
Read, write, and compare decimals to thousandths		*4*			
Use place value understanding to round decimals to any place		*4*			
Perform operations…to hundredths		12			
Fluently multiple multi-digit whole numbers…		*4*			
Find whole-number quotients of whole numbers…		*4*			
Add, subtract, multiply, and divide decimals to hundredths…		*4*			
Number & Operations—Fractions			**28**		
Use equivalent fractions…to add and subtract fractions			8		
Add and subtract fractions with unlike denominators…			*4*		
Solve [fraction word problems by comparison…]			*4*		
Apply and extend…multiplication and division			20		
Interpret a fraction [as a division problem]…			*4*		
[Extend whole number] multiplication to…fractions…			*4*		
Interpret multiplication as scaling (resizing)…			*4*		
Solve…problems [with] multiplication of fractions…			*4*		
[Extend division to involve unit fractions]			*4*		
Measurement & Data				**25**	
Convert like measurement units [in the same] system				5	
Convert among different sized measurement units…				*5*	
Represent and interpret data				5	
Make a line plot to display [data with fractional units]…				*5*	
Geometric measurement: understand…volume				15	
Understand volume as an attribute of solid figures…				*5*	
Measure volumes by counting unit cubes…				*5*	
Relate volume to [multiplication and division]…				*5*	
Geometry					**28**
Graph points on the coordinate plane to solve…					14
Use [two] perpendicular lines…to define a coordinate…					*7*
Represent… points in the first quadrant…					*7*
Classify two-dimensional figures…on…properties					14
[Know category] attributes [apply] to all sub-categories…					*7*
Classify…figures in a hierarchy based on properties					*7*
Total	**27**	**28**	**28**	**25**	**28**

The benefit of a modular interim assessment design is that it can provide much more granular and instructionally useful information because there are enough items measuring fine-grained categories of content to inform broad (not day-to-day) instructional and/or remedial decisions.