Number of Mathematics forms in the Spring 2016 administration	
Grade	**Number of Forms**
3	4 total:
	2 Vertical Linking (VL)
	1 Field Test
	1 Transcription – Form has no items in research positions.
4	6 total:
	4 Vertical Linking (VL)
	1 Field Test
	1 Transcription – Form has no items in research positions.
5	6 total:
	4 Vertical Linking (VL)
	1 Field Test
	1 Transcription – Form has no items in research positions.
6	6 total:
	4 Vertical Linking (VL)
	1 Field Test
	1 Transcription – Form has no items in research positions.
7	6 total:
	4 Vertical Linking (VL)
	1 Field Test
	1 Transcription – Form has no items in research positions.
8	4 total:
	2 Vertical Linking (VL)
	1 Field Test
	1 Transcription – Form has no items in research positions.

Total count of unique Math items field-tested by grade					
Grade	**Field Test Item Count**				
	OA	**NBT**	**NF**	**MD**	**G**
3	1	1	1	1	1
4	1	1	1	1	1
5	1	1	1	1	1

Total count of unique Math items field-tested by grade					
Grade	**Field Test Item Count**				
	RP	**NS**	**EE**	**G**	**SP**
6	2	1	0	1	1
7	1	0	2	1	1

Total count of unique Math items field-tested by grade					
Grade	**Field Test Item Count**				
	NS	**EE**	**F**	**G**	**SP**
8	1	1	1	1	1

Number of items in Mathematics on-line test forms				
Items per Mathematics Form				
Grade	**Total Items**	**Item Category**		
		Core Operational	**Core Backup**	**Vertical Link or FT Slots**
3	47	42	0	5
4	47	42	0	5
5	47	42	0	5
6	51	46	0	5
7	51	46	0	5
8	51	46	0	5

Math Timing Estimates		
	Recommended Range	**Recommended Range (Total Test)**
Grades 3-5 Session 1	35 - 50	70 - 100
Grades 3-5 Session 2	35 - 50	
Grade 6 Session 1	35 - 45	80 - 105
Grade 6 Session 2	45 - 60	
Grade 7 Session 1	20 - 25	80 - 105
Grade 7 Session 2	60 - 80	
Grade 8 Session 1	15 - 20	80 - 105
Grade 8 Session 2	65 -85	

Missouri Grade 3 Mathematics Test Blueprint and Test Design—2016 Administration						
Math Core Items by Content Category						
Mathematics Item Types			# of Core Items	Points Per Item	# of Points	Percent of Total
Operations and Algebraic Thinking	Represent and solve problems involving multiplication and division.	MC/MS	3	1	3	7%
		ASCR	1	1	1	2%
	Understand properties of multiplication and the relationship between multiplication and division.	MC/MS	2	1	2	5%
		ASCR	2	1	2	5%
	Multiply and divide within 100.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
	Solve problems involving the four operations, and identify and explain patterns in arithmetic.	MC/MS	2	1	2	5%
		ASCR	2	1	2	5%
		Total	**15**		**15**	**36%**
Numbers and Operations in Base Ten	Use place value understanding and properties of operations to perform multi-digit arithmetic.	MC/MS	3	1	3	7%
		ASCR	3	1	3	7%
		Total	**6**		**6**	**14%**
Numbers and Operations - Fractions	Develop understanding of fractions as numbers.	MC/MS	4	1	4	10%
		ASCR	3	1	3	7%
		Total	**7**		**7**	**17%**
Measurement and Data	Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
	Represent and interpret data.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
	Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
	Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
		Total	**10**		**10**	**24%**
Geom-etry	Reason with shapes and their attributes.	MC/MS	2	1	2	5%
		ASCR	2	1	2	5%
		Total	**4**		**4**	**10%**
Total Grade 3 Mathematics			**42**		**42**	**100%**

Missouri Grade 3 Mathematics Test Blueprint and Test Design—2016 Administration	
KEY	
MC	**M**ultiple **C**hoice
MS	**M**ulti-**S**elect
ASCR	**A**uto-**S**cored **C**onstructed-**R**esponse (TE including hotspot, highlight, and drag/drop and SA)

Math Test Form Design					
Session	**Reporting Category**	**Total Core Items**	**Total Vertical Linking or FT Items**	**Total Items**	**Recommended Session Time (min)**
1	Mixture of Reporting Categories: Non-Calculator	21	3	24	35 – 50
2	Mixture of Reporting Categories: Non-Calculator	21	2	23	35 – 50
Total		**42**	**5**	**47**	**1 hr 10 min – 1 hr 40 min**

Missouri Grade 4 Mathematics Test Blueprint and Test Design—2016 Administration						
Math Core Items by Content Category						
Mathematics Item Types			**# of Core Items**	**Points Per Item**	**# of Points**	**Percent of Total**
Operations and Algebraic Thinking	Use the four operations with whole numbers to solve problems.	MC/MS	3	1	3	7%
		ASCR	2	1	2	5%
	Gain familiarity with factors and multiples.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
	Generate and analyze patterns.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
		Total	**10**		**10**	**24%**
Numbers and Operations in Base Ten	Generalize place value understanding for multidigit whole numbers.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
	Use place value understanding and properties of operations to perform multi-digit arithmetic.	MC/MS	3	1	3	7%
		ASCR	2	1	2	5%
		Total	**8**		**8**	**19%**
Numbers and Operations - Fractions	Extend understanding of fraction equivalents and ordering.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.	MC/MS	4	1	4	10%
		ASCR	1	1	1	2%
	Understand decimal notation for fractions, and compare decimal fractions.	MC/MS	3	1	3	7%
		ASCR	1	1	1	2%
		Total	**12**		**12**	**29%**
Measurement and Data	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
	Represent and interpret data.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
	Geometric measurement: understand concepts of angle and measure angles.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
		Total	**8**		**8**	**19%**
Geometry	Draw and identify lines and angles, and classify shapes by properties of their lines and angles.	MC/MS	2	1	2	5%
		ASCR	2	1	2	5%
		Total	**4**		**4**	**10%**
Total Grade 4 Mathematics			**42**		**42**	**100%**

Missouri Grade 4 Mathematics Test Blueprint and Test Design—2016 Administration	
KEY	
MC	**M**ultiple **C**hoice
MS	**M**ulti-**S**elect
ASCR	**A**uto-**S**cored **C**onstructed-**R**esponse (TE including hotspot, highlight, and drag/drop and SA)

Math Test Form Design					
Session	**Reporting Category**	**Total Core Items**	**Total Vertical Linking or FT Items**	**Total Items**	**Recommended Session Time (min)**
1	Mixture of Reporting Categories: Non-Calculator	21	3	24	35 – 50
2	Mixture of Reporting Categories: Non-Calculator	21	2	23	35 – 50
Total		**42**	**5**	**47**	**1 hr 10 min – 1 hr 40 min**

Missouri Grade 5 Mathematics Test Blueprint and Test Design—2016 Administration						
Math Core Items by Content Category						
Mathematics Item Types			**# of Core Items**	**Points Per Item**	**# of Points**	**Percent of Total**
Operations and Algebraic Thinking	Write and interpret numerical expressions.	MC/MS	3	1	3	7%
		ASCR	1	1	1	2%
	Analyze patterns and relationships.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
		Total	**6**		**6**	**14%**
Numbers and Operations in Base Ten	Understand the place value system.	MC/MS	2	1	2	5%
		ASCR	2	1	2	5%
	Perform operations with multi-digit whole numbers and with decimals to hundredths.	MC/MS	3	1	3	7%
		ASCR	1	1	1	2%
		Total	**8**		**8**	**19%**
Numbers and Operations - Fractions	Use equivalent fractions as a strategy to add and subtract fractions.	MC/MS	4	1	4	10%
		ASCR	2	1	2	5%
	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	MC/MS	7	1	7	17%
		ASCR	3	1	3	7%
		Total	**16**		**16**	**38%**
Measurement and Data	Convert like measurement units within a given measurement system.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
	Represent and interpret data.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
	Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
		Total	**7**		**7**	**17%**
Geometry	Graph points on the coordinate plane to solve real-world and mathematical problems.	MC/MS	2	1	2	5%
		ASCR	1	1	1	2%
	Classify two-dimensional figures into categories based on their properties.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
		Total	**5**		**5**	**12%**
Total Grade 5 Mathematics			**42**		**42**	**100%**

Missouri Grade 5 Mathematics Test Blueprint and Test Design—2016 Administration	
KEY	
MC	**M**ultiple **C**hoice
MS	**M**ulti-**S**elect
ASCR	**A**uto-**S**cored **C**onstructed-**R**esponse (TE including hotspot, highlight, and drag/drop and SA)

Math Test Form Design					
Session	**Reporting Category**	**Total Core Items**	**Total Vertical Linking or FT Items**	**Total Items**	**Recommended Session Time (min)**
1	Mixture of Reporting Categories: Non-Calculator	21	3	24	35 – 50
2	Mixture of Reporting Categories: Non-Calculator	21	2	23	35 – 50
Total		**42**	**5**	**47**	**1 hr 10 min – 1 hr 40 min**

Missouri Grade 6 Mathematics Test Blueprint and Test Design—2016 Administration						
Math Core Items by Content Category						
Mathematics Item Types			**# of Core Items**	**Points Per Item**	**# of Points**	**Percent of Total**
Ratios and Proportional Relationships	Understand ratio concepts and use ratio reasoning to solve problems.	MC/MS	4	1	4	9%
		ASCR	2	1	2	4%
		Total	**6**		**6**	**13%**
The Number System	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
	Compute fluently with multi-digit numbers and find common factors and multiples.	MC/MS	3	1	3	7%
		ASCR	2	1	2	4%
	Apply and extend previous understandings of numbers to the system of rational numbers.	MC/MS	4	1	4	9%
		ASCR	2	1	2	4%
		Total	**13**		**13**	**28%**
Expressions and Equations	Apply and extend previous understandings of arithmetic to algebraic expressions.	MC/MS	4	1	4	9%
		ASCR	2	1	2	4%
	Reason about and solve one-variable equations and inequalities.	MC/MS	4	1	4	9%
		ASCR	2	1	2	4%
	Represent and analyze quantitative relationships between dependent and independent variables.	MC/MS	2	1	2	4%
		ASCR	1	1	1	2%
		Total	**15**		**15**	**33%**
Geometry	Solve real-world and mathematical problems involving area, surface area, and volume.	MC/MS	4	1	4	9%
		ASCR	2	1	2	4%
		Total	**6**		**6**	**13%**
Statistics and Probability	Develop understanding of statistical variability.	MC/MS	2	1	2	4%
		ASCR	1	1	1	2%
	Summarize and describe distributions.	MC/MS	1	1	1	2%
		ASCR	2	1	2	4%
		Total	**6**		**6**	**13%**
Total Grade 6 Mathematics			**46**		**46**	**100%**

Missouri Grade 6 Mathematics Test Blueprint and Test Design—2016 Administration	
KEY	
MC	**M**ultiple **C**hoice
MS	**M**ulti-**S**elect
ASCR	**A**uto-**S**cored **C**onstructed-**R**esponse (TE including hotspot, highlight, and drag/drop and SA)

Math Test Form Design					
Session	**Reporting Category**	**Total Core Items**	**Total Vertical Linking or FT Items***	**Total Items**	**Recommended Session Time (min)**
1	Mixture of Reporting Categories: Non-Calculator	19	3	22	35 – 45
2	Mixture of Reporting Categories: Calculator	27	2	29	45 – 60
Total		**46**	**5**	**51**	**1 hr 20 min – 1 hr 45 min**
* The grade 6 Verticle Linking Down (VLDN) forms have 5 linking items in Session 1 and 0 in Session 2 due to lack of calculators at grade 5.					

Missouri Grade 7 Mathematics Test Blueprint and Test Design—2016 Administration						
Math Core Items by Content Category						
Mathematics Item Types			**# of Core Items**	**Points Per Item**	**# of Points**	**Percent of Total**
Ratios and Proportional Relationships	Analyze proportional relationships and use them to solve real-world and mathematical problems.	MC/MS	7	1	7	15%
		ASCR	3	1	3	7%
		Total	**10**		**10**	**22%**
The Number System	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.	MC/MS	5	1	5	11%
		ASCR	3	1	3	7%
		Total	**8**		**8**	**17%**
Expressions and Equations	Use properties of operations to generate equivalent expressions.	MC/MS	4	1	4	9%
		ASCR	1	1	1	2%
	Solve real-life and mathematical problems using numerical and algebraic expressions and equations.	MC/MS	6	1	6	13%
		ASCR	2	1	2	4%
		Total	**13**		**13**	**28%**
Geometry	Draw, construct and describe geometrical figures and describe the relationships between them.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
	Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.	MC/MS	3	1	3	7%
		ASCR	2	1	2	4%
		Total	**7**		**7**	**15%**
Statistics and Probability	Use random sampling to draw inferences about a population.	MC/MS	2	1	2	4%
		ASCR	1	1	1	2%
	Draw informal comparative inferences about two populations.	MC/MS	1	1	1	2%
		ASCR	1	1	1	2%
	Investigate chance processes and develop, use, and evaluate probability models.	MC/MS	2	1	2	4%
		ASCR	1	1	1	2%
		Total	**8**		**8**	**17%**
Total Grade 7 Mathematics			**46**		**16**	**100%**

Missouri Grade 7 Mathematics Test Blueprint and Test Design—2016 Administration	
KEY	
MC	**M**ultiple **C**hoice
MS	**M**ulti-**S**elect
ASCR	**A**uto-**S**cored **C**onstructed-**R**esponse (TE including hotspot, highlight, and drag/drop and SA)

Math Test Form Design					
Session	**Reporting Category**	**Total Core Items**	**Total Vertical Linking or FT Items**	**Total Items**	**Recommended Session Time (min)**
1	Mixture of Reporting Categories: Non-Calculator	13	1	14	20 – 25
2	Mixture of Reporting Categories: Calculator	33	4	37	60 – 80
Total		**46**	**5**	**51**	**1 hr 20 min – 1 hr 45 min**

Missouri Grade 8 Mathematics Test Blueprint and Test Design—2016 Administration						
Math Core Items by Content Category						
Mathematics Item Types			**# of Core Items**	**Points Per Item**	**# of Points**	**Percent of Total**
The Number System	Know that there are numbers that are not rational, and approximate them by rational numbers.	MC/MS	2	1	2	4%
		ASCR	2	1	2	4%
		Total	**4**		**4**	**9%**
Expressions and Equations	Work with radicals and integer exponents.	MC/MS	3	1	3	7%
		ASCR	2	1	2	4%
	Understand the connections between proportional relationships, lines, and linear equations.	MC/MS	3	1	3	7%
		ASCR	1	1	1	2%
	Analyze and solve linear equations and pairs of simultaneous linear equations.	MC/MS	4	1	4	9%
		ASCR	2	1	2	4%
		Total	**15**		**15**	**33%**
Functions	Define, evaluate, and compare functions.	MC/MS	4	1	4	9%
		ASCR	1	1	1	4%
	Use functions to model relationships between quantities.	MC/MS	4	1	4	9%
		ASCR	1	1	1	4%
9		**Total**	**10**		**10**	**22%**
Geometry	Understand congruence and similarity using physical models, transparencies, or geometry software.	MC/MS	2	1	2	4%
		ASCR	2	1	2	4%
	Understand and apply the Pythagorean Theorem.	MC/MS	2	1	2	4%
		ASCR	1	1	1	2%
	Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.	MC/MS	3	1	3	7%
		ASCR	1	1	1	2%
		Total	**11**	**1**	**11**	**24%**
		Total	**6**		**6**	**13%**
Total Grade 8 Mathematics			**46**		**46**	**100%**

Missouri Grade 8 Mathematics Test Blueprint and Test Design—2016 Administration	
KEY	
MC	**M**ultiple **C**hoice
MS	**M**ulti-**S**elect
ASCR	**A**uto-**S**cored **C**onstructed-**R**esponse (TE including hotspot, highlight, and drag/drop and SA)

Math Test Form Design					
Session	**Reporting Category**	**Total Core Items**	**Total Vertical Linking or FT Items**	**Total Items**	**Recommended Session Time (min)**
1	Mixture of Reporting Categories: Non-Calculator	10	1	11	15 – 20
2	Mixture of Reporting Categories: Calculator	36	4	40	65 – 85
Total		**46**	**5**	**51**	**1 hr 20 min – 1 hr 45 min**