SEARCHING FOR OPPORTUNITIES

USING THE PROBLEM SOLVING TO IMPROVE STUDENT ACHIEVEMENT

TARGET AREA: DATA

> It's often the people that no one imagines anything of, that do the things no one can imagine."
>
> — The Imitation Game

PREPARED FOR THE COLLABORATIVE LEARNING NETWORK OF THE

VIRGINIA TIERED SYSTEM OF SUPPORTS

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JANUARY 2015

NOTE: New SOL Score Reports in Reading, Mathematics, Science, and History: Newly designed SOL score reports will be introduced for SOL tests administered in the content areas of reading, mathematics, science, and history beginning in fall 2014. The new SOL Student Score Reports will be presented in an easier-to-read format for school personnel and parents.

Know the Target

Accountability Year	2012-2013	Sch/Div	2013-2014	Sch/Div	2014-2015	2015-2016	2016-2017	2017-2018
Assessment Year	2011-2012	2011-2012	2012-2013	Current	2013-2014	2014-2015	2015-2016	2016-2017
All students	61		64		66	68	70	73
Proficiency Gap Group 1 (SWD, LEP, Poverty)	47		52		57	63	68	
Proficiency Gap Group 2 (African-American)	45		51		56	62	67	
Proficiency Gap Group 3 (Hispanic)	52		56		60	65	69	73
Students with Disabilities	33		41		49	57	65	
Limited English Proficiency	39		46		53	59	66	
Economically Disadvantaged	47		52		57	63	68	
White	68		69		70	71	72	
Asian	82			Continuous progress				

VIRGINIA MATHEMATICS MINIMUM ACHIEVEMENT CUT SCORES

Test	Failing Scores		Passing Scores			
	Basic		Proficient		Advanced	
	# correct	% correct	Minimum # correct	Minimum % correct	Minimum # correct	Minimum % correct
Math 3	16 of 40	40%	26 of 40	65%	36 of 40	90%
Math 4	17 of 50	34%	31 of 50	62%	45 of 50	90%
Math 5	18 of 50	36%	31 of 50	62%	45 of 50	90%
Math 6	16 of 50	32%	28 of 50	56%	45 of 50	90%
Math 7	17 of 50	34%	31 of 50	62%	45 of 50	90%
Math 8	17 of 50	34%	31 of 50	62%	46 of 50	92%
Algebra I	n/a	n/a	25 of 50	50%	45 of 50	90%
Geometry	n/a	n/a	25 of 50	50%	44 of 50	88%
Algebra II	n/a	n/a	27 of 50	54%	43 of 50	86%

VIRGINIA MATHEMATICS SOL BLUEPRINTS BY REPORTING CATEGORY

(DRILLING DOWN TO THE CURRICULUM FRAMEWORK)

Math SOL Blueprints

	Math 3		Math 4		Math 5		Math 6				Math 7		Math 8	
	# Items	% Items	# Items	% Items	# Items	% Items	CAT# Items	CAT% Items	# Items	% Items	# Items	% Items	# Items	% Items
NNS	10	25	12	24	7	14	9	20	10	20	16	32	14	28
CE	10	25	13	26	13	26	8	18	9	18				
MG	11	27.5	13	26	12	24	11	24	12	24	13	26	14	28
PS/PFA	9	22.5	12	24	18	36	17	38	19	38	21	42	22	44

Algebra I	# Items	% Items
Expressions & Operations	12	24
Equations & Inequalities	18	36
Functions & Statistics	20	40

Algebra II	# Items	% Items
Expressions & Operations	13	26
Equations & Inequalities	13	26
Functions & Statistics	24	48

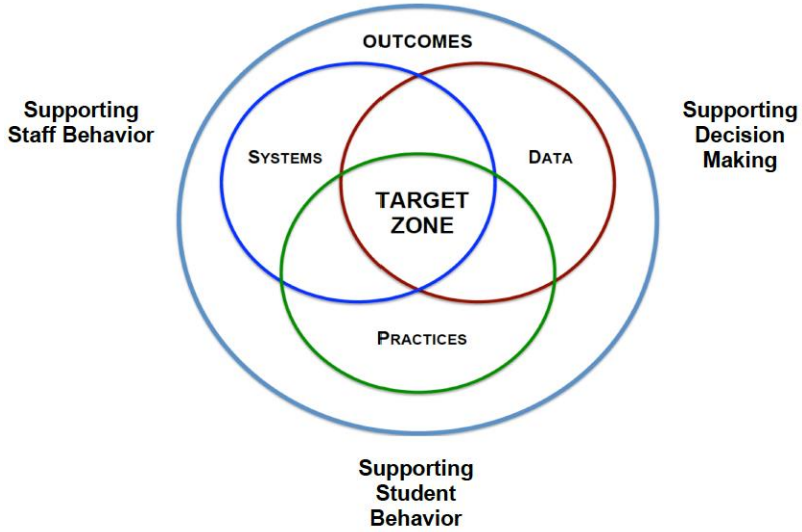
Geometry	# Items	% Items
Reasoning, Lines, & Transformations	18	36
Triangles	14	28
Polygons, Circles, &Three-Dimensional Figures	18	36

NOTE: Math 6 contains both Computer Adaptive Test (CAT) Blueprints and Traditional Blueprints

Data: information that is used to identify status, need for change, and effects of interventions.

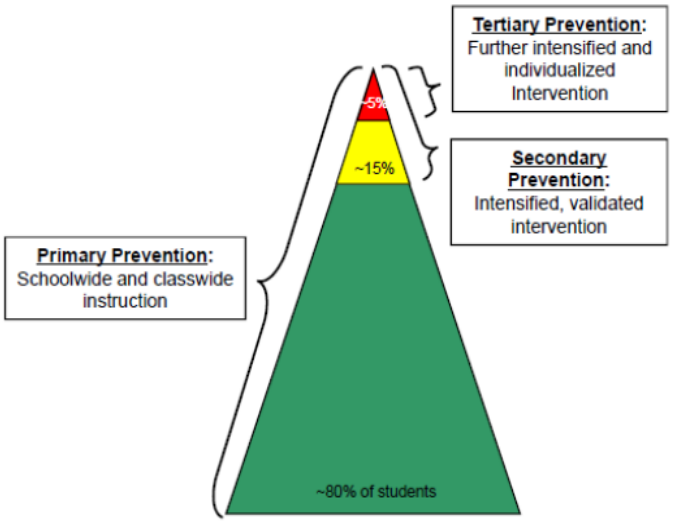
Know 1. The indicators to look for in the data 2. The data points to access tiered support (tier definition) 3. The role of administration concerning data 4. The ways to make data transparent 5. The ways to know when the indicators have been met	**My notes:**
Understand 1. The relationship between academic and behavioral data 2. A process for mining the data 3. The importance of teaching teachers data utilization 4. The need for precise and structured data meetings	
Do 1. Complete Assessment Mapping as part of Resource Mapping 2. Utilize structures for data meetings 3. Create data dashboards for various purposes	

Evidence Based Practice Organizer



VIRGINIA TEIRED SYSTEM OF SUPPORTS

The Virginia VTSS model is a hybrid model of RtI, meaning it involves using both a curricula protocol and problem solving in the planning of instruction



Virginia Tiered System of Supports (VTSS) School Division Benchmarks

MONITORING STUDENT PROGRESS

Emerging

- The school leadership team and principals have access to and use assessment data.
- Parents and students are informed about the purpose of assessments.
- The school division has an assessment map and the explanation of the utility of each tool that is visible and easily understood.
- The division uses multiple measures with set benchmarks to raise academic and behavioral standards.
- A process is established to ensure fidelity of assessment.
- Teachers and leaders are aware of the value of frequent progress monitoring, and use this data effectively to identify students who need early intervention.
- Data from various sources are shared and analyzed, and specific plans are implemented to determine if the instructional and behavioral interventions are effective.
- The division has established criteria for assessment results and set levels of expectations for tiers.

Developing

- Classroom teachers have access to screening and frequent progress monitoring assessment data and receive structured sequential training on using assessments and interpreting results.
- School division and school teams use universal screening and formative assessment data to make decisions and to provide interventions that optimize student growth.
- School and division teams schedule staff training and fidelity checks on all assessment measures used.
- Parents and students understand the purpose of assessments and participate in self-monitoring and tracking of learning progress.
- Progress monitoring is scheduled and documented, and used to plan instruction.
- Decision rules are understood and used by all teams.

Sustaining VTSS

- Decisions about curriculum, instruction, and all specific interventions across tiers are made using student progress monitoring data.
- The school division uses a formal system of monitoring student progress that includes universal screening, formative assessment, and other diagnostic processes.

By School

Overall Mean Scaled Score: 420.5

Gr 3 Mathematics

Form: M--23 **Core: 2**

Reporting Category: Number and Number Sense — **Mean Scaled Score: 32.8**

Description of Question	% Correct In School	% Correct In Division
Write and represent fractions and mixed numbers using models.	81	81
Round numbers to a specified place value.	90	90
Model fractions and mixed numbers.	69	69
Complete related fact sentences.	41	41
Compare fractions and mixed numbers using models, words, and symbols.	58	58
Compare whole numbers using symbols.	83	83
Write and represent fractions and mixed numbers using models.	89	89
Complete related fact sentences.	90	90
Round numbers to a specified place value.	92	92
Interpret the place and value of each digit of a whole number.	73	73

Reporting Category: Computation and Estimation — **Mean Scaled Score: 33.3**

Description of Question	% Correct In School	% Correct In Division
Solve division facts.	57	57
Solve practical problems that apply knowledge of multiplication.	63	63
Solve practical problems involving estimation, sums, and differences of whole numbers.	73	73
Solve problems involving addition of proper fractions with like denominators using models.	74	74
Solve practical multistep problems involving estimation, sums, and differences of whole numbers.	52	52
Use a variety of models to represent multiplication and division facts.	72	72
Solve problems involving addition of proper fractions with like denominators using models.	77	77
Solve multiplication facts.	91	91
Use a variety of models to represent multiplication and division facts.	72	72
Solve problems involving addition of proper fractions with like denominators using models.	58	58

Reporting Category: Measurement and Geometry — **Mean Scaled Score: 32.7**

Description of Question	% Correct In School	% Correct In Division
Compare and contrast characteristics of lines, line segments, rays, and angles.	81	81
Describe the congruence or noncongruence of two figures.	79	79
Tell time to the nearest minute.	52	52
Compare values of sets of coins.	79	79
Use estimation skills and determine appropriate units of measure to find weight/mass.	75	75
Measure a figure to find perimeter.	77	77
Identify plane and solid geometric figures.	84	84
Find the area of a figure when given the square unit.	75	75
Read temperature to the nearest degree on thermometers with varied increments.	76	76
Apply estimation skills to find perimeter and area of figures/objects.	54	54
Solve practical problems that require computation of elapsed time to the nearest hour.	69	69

Overall Mean Scaled Score: 420.5

Gr 3 Mathematics (continued)

Form: M--23 **Core: 2**

Reporting Category: Probability, Statistics, Patterns, Functions, and Algebra

Mean Scaled Score: 32.2

Description of Question	% Correct In School	% Correct In Division
Recognize the use of the identity and commutative properties.	55	55
Recognize, describe, and extend patterns in various forms.	63	63
Analyze outcomes of events.	59	59
Construct a line plot.	86	86
Recognize, describe, and extend patterns in various forms.	51	51
Analyze and interpret information represented on graphs.	75	75
Analyze and interpret information represented on graphs.	55	55
Analyze and interpret information represented on graphs.	54	54
List outcomes of events.	58	58

SEARCHING FOR OPPORTUNITIES

Record the Overall Mean Scaled Score from 2013: _____

What will the Overall Mean Scaled Score be in 2014? _____

Record the Reporting Category Mean Scaled Score from 2013:

NNS		CE		MG		PS/PFA	
#Items	MSS	# Items	MSS	# Items	MSS	# Items	MSS

Which Reporting Categories are the greatest opportunities for improving student achievement in 2013 – 2014? Explain (include a discussion of the objectives).

GRADE 4 SAMPLE SPBQ

by School

Students Tested: 140
Overall Mean Scaled Score: 417.6

Gr 4 Mathematics

Form: M--23 **Core: 2**

Reporting Category: Number and Number Sense — **Mean Scaled Score: 31.0**

Description of Question	% Correct In School	% Correct In Division
Represent fraction/decimal equivalence using models.	63	63
Identify the relationship between fractions and division statements.	87	87
Represent equivalent fractions using models.	36	36
Compare decimals without models.	66	66
Represent equivalent fractions using models.	56	56
Use the place value structure to round decimals without models.	54	54
Use the place value structure to compare whole numbers without models.	41	41
Represent fraction/decimal equivalence using models.	58	58
Identify place and value of digits in decimals.	51	51
Identify place and value of digits in whole numbers.	70	70
Order a set of fractions without models.	47	47
Use the place value structure to round whole numbers.	79	79

Reporting Category: Computation and Estimation — **Mean Scaled Score: 31.6**

Description of Question	% Correct In School	% Correct In Division
Solve problems involving addition of decimals.	76	76
Solve practical problems involving addition and subtraction of decimals.	73	73
Find common multiples of two numbers, including least common multiple (LCM).	61	61
Solve problems involving division of whole numbers.	79	79
Solve subtraction problems with decimals using models.	41	41
Solve problems involving multiplication of whole numbers.	91	91
Solve practical problems involving multiplication of whole numbers.	70	70
Solve problems involving subtraction of fractions.	53	53
Solve multistep practical problems involving whole numbers.	37	37
Find common factors of two numbers, including greatest common factor (GCF).	26	26
Solve practical problems involving addition of fractions.	56	56
Estimate solutions to problems involving subtraction of whole numbers.	59	59
Solve problems involving addition of fractions.	51	51

Reporting Category: Measurement and Geometry — **Mean Scaled Score: 32.6**

Description of Question	% Correct In School	% Correct In Division
Identify equivalent measures using appropriate units for liquid volume.	79	79
Measure objects using appropriate units for length.	66	66
Identify equivalent measures using appropriate units for weight/mass.	47	47
Identify representations of lines that illustrate parallelism, perpendicularity, and intersection.	80	80
Demonstrate understanding of the measure of liquid volume.	71	71
Identify and recognize congruent images resulting from transformations.	59	59
Describe geometric figures and their properties.	86	86
Estimate measures for objects using appropriate units for weight/mass.	64	64
Identify equivalent measures using appropriate units for length.	59	59
Identify representations of geometric figures, including polygons.	54	54
Recognize congruent figures.	91	91
Describe geometric figures and their properties.	66	66
Determine elapsed time.	39	39

Overall Mean Scaled Score: 417.6

Gr 4 Mathematics (continued)

Form: M--23 **Core: 2**

Reporting Category: Probability, Statistics, Patterns, Functions, and Algebra

Mean Scaled Score: 32.2

Description of Question	% Correct In School	% Correct In Division
Determine and represent the outcomes of events using fractional representations from 0 to 1, including representations on a number line.	78	78
Interpret bar graphs.	59	59
Predict and describe outcomes of events using words.	48	48
Construct bar graphs from collected data.	83	83
Identify the use of the associative property.	72	72
Recognize and extend patterns.	24	24
Recognize equality in equations.	81	81
Recognize and extend patterns.	49	49
Predict and describe outcomes of events using fractions from 0 to 1.	66	66
Interpret line graphs.	54	54
Recognize and extend patterns.	53	53
Demonstrate equality in equations.	69	69

SEARCHING FOR OPPORTUNITIES

Record the Overall Mean Scaled Score from 2013: _____

What will the Overall Mean Scaled Score be in 2014? _____

Record the Reporting Category Mean Scaled Score from 2013:

NNS		CE		MG		PS/PFA	
#Items	MSS	# Items	MSS	# Items	MSS	# Items	MSS

Which Reporting Categories are the greatest opportunities for improving student achievement in 2013 – 2014? Explain (include a discussion of the objectives).

by School

Overall Mean Scaled Score: 423.8

Gr 5 Mathematics

Form: M--23 **Core: 2**

Reporting Category: Number and Number Sense — **Mean Scaled Score: 33.7**

Description of Question	% Correct In School	% Correct In Division
Represent equivalent relationships between decimals and fractions.	73	73
Order a set of decimals and fractions.	42	42
Represent equivalent relationships between decimals and fractions.	63	63
Describe the characteristics of odd and even numbers.	53	53
Round decimal numbers.	72	72
Identify prime and composite numbers.	87	87
Round decimal numbers.	84	84

Reporting Category: Computation and Estimation — **Mean Scaled Score: 32.1**

Description of Question	% Correct In School	% Correct In Division
Solve problems involving multiplication of decimals.	38	38
Solve multistep practical problems involving whole numbers.	49	49
Solve multistep practical problems involving fractions and mixed numbers.	34	34
Solve multistep practical problems involving decimals.	65	65
Solve problems involving subtraction of decimals through the thousandths.	88	88
Solve multistep practical problems involving whole numbers.	24	24
Solve multistep practical problems involving mixed numbers.	41	41
Solve problems involving division of decimals through the thousandths.	91	91
Solve single-step practical problems involving subtraction of whole numbers.	76	76
Simplify whole number numerical expressions using the order of operations.	50	50
Solve multistep practical problems involving addition of mixed numbers.	69	69
Simplify whole number numerical expressions using the order of operations.	94	94
Solve multistep practical problems involving decimals.	54	54

Reporting Category: Measurement and Geometry — **Mean Scaled Score: 34.2**

Description of Question	% Correct In School	% Correct In Division
Identify equivalent measurements within the metric system.	67	67
Determine the measure of a given angle.	74	74
Identify the appropriate unit of measure for the volume of a specified object.	81	81
Determine the area of a rectangle.	74	74
Describe the relationship between the parts of a circle.	85	85
Describe the results of combining and subdividing shapes.	85	85
Develop definitions for triangles, squares, rectangles, parallelograms, rhombi, and trapezoids.	45	45
Determine the appropriate usage of area when given a situation.	71	71
Determine the length of an object using U.S. Customary units.	72	72
Classify angles.	94	94
Determine elapsed time to the nearest minute within a 12-hour period.	67	67
Classify triangles.	77	77

Reporting Category: Probability, Statistics, Patterns, Functions, and Algebra — **Mean Scaled Score: 31.9**

Description of Question	% Correct In School	% Correct In Division
Calculate the median for a set of data.	74	74
Model a one-step linear equation.	50	50
Identify a data set with the greatest variation.	68	68
Use an open sentence to represent a mathematical relationship.	44	44
Interpret information represented in a line graph.	59	59
Identify and extend numerical patterns.	65	65
Construct a sample space using a list to determine possible outcomes of a single event.	73	73
Identify a variable in a given equation.	88	88
Describe mean as a fair share.	73	73
Use a data set to construct a stem-and-leaf plot.	70	70
Use words to express the relationship found in a pattern.	82	82
Model a one-step linear equation.	87	87
Use an open sentence to represent a mathematical relationship.	69	69
Recognize the application of the distributive property.	63	63
Use an open sentence to represent a practical problem situation.	66	66
Construct a sample space using a tree diagram to determine possible outcomes of a single event.	64	64
Define a variable in an expression representing a practical problem situation.	56	56
Calculate the mean for a set of data.	67	67

SEARCHING FOR OPPORTUNITIES

Record the Overall Mean Scaled Score from 2013:

_____

What will the Overall Mean Scaled Score be in 2014?

_____

Record the Reporting Category Mean Scaled Score from 2013:

NNS		CE		MG		PS/PFA	
#Items	MSS	# Items	MSS	# Items	MSS	# Items	MSS

Which Reporting Categories are the greatest opportunities for improving student achievement in 2013 – 2014? Explain (include a discussion of the objectives).

A Vertical Snapshot of Student Achievement – Looking for Opportunities

	Math 3		Math 4		Math 5		Math 6	
	# items	% of test (incr./decr.)	# items	% of test (incr./decr.)	# items	% of test (incr./decr.)	# items	% of test (incr./decr.)
NNS	13	25 (-1)	12	24 (+8)	7	14 (-2)	10	20 (+4)
CE	11	25 (+3)	13	26 (+2)	13	26 (+2)	9	18 (-2)
MG	12	27.5 (+3.5)	13	26 (+2)	12	24 (0)	12	24 (0)
PS/ PFA	14	22.5 (-5.5)	12	24 (-12)	18	36 (0)	19	38 (-2)

Sample

Reporting Categories	Math K-3	Math 4	Math 5	Math 6	Math 7	Math 8
Number & Number Sense	32.8	31.0	33.7	32.9	26.5	30.6
Computation & Estimation	33.3	31.6	32.1	33.3		
Measurement & Geometry	32.7	32.6	34.2	33.7	30.2	31.6
Probability, Statistics, Patterns, Functions & Algebra	32.2	32.2	31.9	32.1	25.7	29.5

Template:

Reporting Categories	Math K-3	Math 4	Math 5	Math 6	Math 7	Math 8
Number & Number Sense						
Computation & Estimation						
Measurement & Geometry						
Probability, Statistics, Patterns, Functions & Algebra						

Virginia Assessment Program

Summary Report by Division

Students Tested: 358
Overall Mean Scaled Score: 417.9

Gr 3 Mathematics

Form: M--22 **Core: 2**

Reporting Category: Number and Number Sense — **Mean Scaled Score: 33.0**

Description of Question	% Correct In Division
Use inverse operations to determine a missing quantity.	97
Write and represent fractions and mixed numbers using models.	96
Write and represent whole numbers using models.	96
Round a number to the nearest thousand.	74
Compare fractions and mixed numbers using models, words, and symbols.	60
Compare whole numbers using symbols.	87
Write and represent fractions and mixed numbers using models.	87
Complete related fact sentences.	79
Compare two fractions represented by models.	48
Interpret the place and value of each digit of a whole number.	72

Reporting Category: Computation and Estimation — **Mean Scaled Score: 32.0**

Description of Question	% Correct In Division
Solve division facts.	82
Solve practical problems that apply knowledge of multiplication.	53
Solve practical problems involving estimation, sums, and differences of whole numbers.	79
Solve problems involving addition of proper fractions with like denominators using models.	63
Recall multiplication and division facts.	95
Solve a multi-step problem involving the sum and/or difference of whole numbers.	47
Solve problems involving addition of proper fractions with like denominators using models.	54
Solve problems that apply knowledge of sums and differences of whole numbers.	67
Identify a multiplication model on a number line.	87
Subtract two proper fractions represented by models.	32

Reporting Category: Measurement and Geometry — **Mean Scaled Score: 32.4**

Description of Question	% Correct In Division
Solve practical problems that require computation of equivalent periods of time.	75
Identify a geometric figure representing a given characteristic.	92
Tell time to the nearest minute.	53
Determine the correct group of coins and bills needed to make change.	62
Use estimation skills and determine appropriate units of measure to find weight/mass.	89
Identify congruent and noncongruent plane figures.	89
Identify the ending time when given the beginning and elapsed times.	57
Measure the perimeter of a polygon.	28
Read temperature to the nearest degree on thermometers with varied increments.	36
Identify a model of a line segment.	79
Estimate area using U.S. Customary or metric units.	82

Gr 3 Mathematics (continued)

Form: M--22 **Core: 2**

Reporting Category: Probability, Statistics, Patterns, Functions, and Algebra

Mean Scaled Score: 31.7

Description of Question	% Correct In Division
Solve a problem using information in a pictograph.	49
Recognize, describe, and extend patterns in various forms.	57
Analyze and interpret information represented on graphs.	87
Identify the most likely outcome of a given situation.	66
Analyze and interpret information represented on graphs.	61
Recognize the use of the identity property.	52
Identify a table that represents a practical problem.	78
Analyze and interpret information represented on graphs.	55
List outcomes of events.	66

SEARCHING FOR OPPORTUNITIES

Record the Overall Mean Scaled Score from 2013: _____

What will the Overall Mean Scaled Score be in 2014? _____

Record the Reporting Category Mean Scaled Score from 2013:

NNS		CE		MG		PS/PFA	
#Items	MSS	# Items	MSS	# Items	MSS	# Items	MSS

Which Reporting Categories are the greatest opportunities for improving student achievement in 2013 – 2014? Explain (include a discussion of the objectives).

Gr 3 Mathematics

Subgroups	Tests Administered #	Tests Administered %	Percent Passing	Total Mean Scaled Score	Reporting Category Mean Scaled Score 1	2	3	4				No Score	Fail/ Below Basic #	Fail/ Below Basic %	Fail/ Basic #	Fail/ Basic %	Pass/ Proficient #	Pass/ Proficient %	Pass/ Advanced #	Pass/ Advanced %
GENDER																				
Female	204	57	57.84	417.2	32.5	32.6	32.3	31.2					21	10	65	32	98	48	20	10
Male	155	43	58.71	418.8	33.5	31.2	32.7	32.4					15	10	49	32	72	46	19	12
STUDENTS WITH DISABILITIES	50	14	26.00	368.9	27.9	27.4	27.8	26.2					17	34	20	40	12	24	1	2
SOA ADJUSTMENT	18	5	55.56	423.3	35.3	31.4	33.4	31.9					3	17	5	28	7	39	3	17
RECOVERY	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
N-CODE	218	61	49.08	402.7	31.3	30.8	30.8	30.0					31	14	80	37	92	42	15	7
RETEST	0	0	0.00	0.0	0.0	0.0	0.0	0.0				0	0	0	0	0	0	0	0	0
D-CODE	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
RACE/ETHNICITY																				
Ethnicity: Hispanic: Yes																				
One Race																				
American Indian or Alaska Native	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
Asian	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0

Reporting Categories:
1 = Number and Number Sense
2 = Computation and Estimation
3 = Measurement and Geometry
4 = Probability, Statistics, Patterns, Functions, and Algebra

What is the story in the data?	Is any action required? Why? How will we know it worked?

Gr 3 Mathematics

Subgroups	Tests Administered #	Tests Administered %	Percent Passing	Total Mean Scaled Score	Reporting Category Mean Scaled Score 1	2	3	4				No Score	Fall/ Below Basic #	Fall/ Below Basic %	Fall/ Basic #	Fall/ Basic %	Pass/ Proficient #	Pass/ Proficient %	Pass/ Advanced #	Pass/ Advanced %
RACE/ETHNICITY **Ethnicity: Hispanic: No One Race**																				
Asian	2	1	50.00	454.0	38.5	29.5	43.5	35.0					0	0	1	50	0	0	1	50
Black or African American	150	42	49.33	400.5	31.1	31.0	30.6	29.5					20	13	56	37	65	43	9	6
White	189	53	63.49	429.0	34.0	32.6	33.7	33.2					14	7	55	29	94	50	26	14
Native Hawaiian/Other Pacific Islander	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
Combination of Two Races American Indian/Alaska Native and Asian	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
American Indian/Alaska Native and Black or African American	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0

Reporting Categories:
1 = Number and Number Sense
2 = Computation and Estimation
3 = Measurement and Geometry
4 = Probability, Statistics, Patterns, Functions, and Algebra

What is the story in the data?	Is any action required? Why? How will we know it worked?

Virginia Assessment Program

Summary Report by Division

Students Tested: 371
Overall Mean Scaled Score: 422.1

Gr 4 Mathematics

Form: M--22 **Core: 2**

Reporting Category: Number and Number Sense — **Mean Scaled Score: 32.4**

Description of Question	% Correct In Division
Identify place and value of digits in decimals.	61
Identify the relationship between fractions and division statements.	88
Compare two whole numbers.	83
Compare decimals without models.	62
Represent equivalent fractions using models.	48
Compare two whole numbers.	78
Order a set of fractions without models.	39
Round a 7-digit number to a designated place.	71
Represent fraction/decimal equivalence using models.	44
Identify the standard form of a whole number written in words.	79
Compare decimals without models.	60
Identify decimal that rounds to a specified number.	47

Reporting Category: Computation and Estimation — **Mean Scaled Score: 33.1**

Description of Question	% Correct In Division
Solve problems involving addition of fractions.	76
Solve practical problems involving subtraction of decimals.	67
Estimate solutions to practical problems involving multiplication of whole numbers.	54
Solve problems involving division of whole numbers.	83
Find the LCM of three numbers.	52
Solve problems involving multiplication of whole numbers.	94
Solve practical problems involving multiplication of whole numbers.	67
Solve problems involving subtraction of fractions.	59
Solve multistep practical problems involving whole numbers.	62
Solve multistep problem with fractions.	27
Find the difference of a whole number and a decimal.	65
Solve multistep practical problems involving whole numbers.	55
Find common factors of a set of numbers.	82

Reporting Category: Measurement and Geometry — **Mean Scaled Score: 32.5**

Description of Question	% Correct In Division
Recognize congruent figures.	81
Measure objects using appropriate units for length.	65
Identify equivalent measures using appropriate units for weight/mass.	53
Identify representations of lines that illustrate parallelism, perpendicularity, and intersection.	80
Identify shapes with a given number of vertices.	73
Identify equivalent measures using appropriate units for liquid volume.	63
Determine elapsed time given start time and end time.	39
Estimate measures for objects using appropriate units for weight/mass.	69
Identify and recognize congruent images resulting from transformations.	78
Identify equivalent measurements of length within the US Customary system.	64
Identify representations of geometric figures, including polygons.	47
Describe geometric figures and their properties.	64
Estimate measures for objects using appropriate units for liquid volume.	86

Gr 4 Mathematics (continued)

Form: M--22 **Core: 2**

Reporting Category: Probability, Statistics, Patterns, Functions, and Algebra — **Mean Scaled Score: 32.5**

Description of Question	% Correct In Division
Interpret line graphs.	71
Recognize equality in equations.	74
Predict and describe outcomes of events using words.	49
Recognize and extend patterns.	72
Determine the probability of a simple event as a number between 0 and 1, using a number line.	78
Interpret line graphs.	61
Recognize equality in equations.	64
Evaluate and extend a pattern.	51
Identify equation that shows the associative property of multiplication.	65
Interpret line graphs.	65
Recognize and extend patterns.	52
Determine and represent the outcomes of events using fractional representations from 0 to 1, including representations on a number line.	81

SEARCHING FOR OPPORTUNITIES

Record the Overall Mean Scaled Score from 2013: _____

What will the Overall Mean Scaled Score be in 2014? _____

Record the Reporting Category Mean Scaled Score from 2013:

NNS		CE		MG		PS/PFA	
#Items	MSS	# Items	MSS	# Items	MSS	# Items	MSS

Which Reporting Categories are the greatest opportunities for improving student achievement in 2013 – 2014? Explain (include a discussion of the objectives).

Gr 4 Mathematics

Subgroups	Tests Administered #	Tests Administered %	Percent Passing	Total Mean Scaled Score	Reporting Category Mean Scaled Score 1	2	3	4				No Score	Fail/ Below Basic #	Fail/ Below Basic %	Fail/ Basic #	Fail/ Basic %	Pass/ Proficient #	Pass/ Proficient %	Pass/ Advanced #	Pass/ Advanced %
GENDER																				
Female	172	46	59.88	418.1	31.8	32.6	31.9	32.4					7	4	62	36	83	48	20	12
Male	204	54	64.22	423.4	32.7	33.2	32.7	32.4					10	5	63	31	103	50	28	14
STUDENTS WITH DISABILITIES	66	18	30.30	376.0	27.7	29.0	27.6	26.9					10	15	36	55	19	29	1	2
SOA ADJUSTMENT	13	3	53.85	400.5	30.3	31.0	31.5	28.2					2	15	4	31	6	46	1	8
RECOVERY	156	41	34.62	379.9	27.7	28.3	28.5	28.3					15	10	87	56	53	34	1	1
N-CODE	234	62	53.42	405.2	30.6	31.4	30.9	30.7					14	6	95	41	111	47	14	6
RETEST	0	0	0.00	0.0	0.0	0.0	0.0	0.0				0	0	0	0	0	0	0	0	0
D-CODE	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
RACE/ETHNICITY																				
Ethnicity: Hispanic: Yes																				
One Race																				
American Indian or Alaska Native	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
Asian	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0

Reporting Categories:
1 = Number and Number Sense
2 = Computation and Estimation
3 = Measurement and Geometry
4 = Probability, Statistics, Patterns, Functions, and Algebra

What is the story in the data?	Is any action required? Why? How will we know it worked?

Gr 4 Mathematics

Subgroups	Tests Administered #	Tests Administered %	Percent Passing	Total Mean Scaled Score	Reporting Category Mean Scaled Score 1	2	3	4				No Score	Fail/ Below Basic #	Fail/ Below Basic %	Fail/ Basic #	Fail/ Basic %	Pass/ Proficient #	Pass/ Proficient %	Pass/ Advanced #	Pass/ Advanced %
RACE/ETHNICITY **Ethnicity: Hispanic: No One Race**																				
Asian	3	1	100.00	466.7	36.7	41.0	35.0	34.7					0	0	0	0	2	67	1	33
Black or African American	153	41	45.75	395.3	29.7	30.0	30.0	29.7					13	8	70	46	65	42	5	3
White	202	54	74.75	441.4	34.4	35.3	34.0	34.6					2	1	49	24	109	54	42	21
Native Hawaiian/Other Pacific Islander	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
Combination of Two Races American Indian/Alaska Native and Asian	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0
American Indian/Alaska Native and Black or African American	0	0	0.00	0.0	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0

Reporting Categories:
1 = Number and Number Sense
2 = Computation and Estimation
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What is the story in the data?	Is any action required? Why? How will we know it worked?

Seizing Opportunities
SOL Data Analysis Summary

All Students

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3					
Grade 4					
Grade 5					

Black Students

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3					
Grade 4					
Grade 5					

White Students

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3					
Grade 4					
Grade 5					

Students with Disabilities

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3					
Grade 4					
Grade 5					

N-Code Students

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3					
Grade 4					
Grade 5					

All Students

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3	417.9	33.0	32.0	32.4	31.7
Grade 4	422.1	32.4	33.1	32.5	32.5
Grade 5	450.5	37.9	35.5	35.1	35.1

Black Students

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3	400.5	31.1	31.0	30.6	29.5
Grade 4	395.3	29.7	30.0	30.0	29.7
Grade 5	430.3	36.2	32.9	33.4	33.4

White Students

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3	429.0	34.0	32.6	33.7	33.2
Grade 4	441.4	34.4	35.3	34.0	34.6
Grade 5	464.0	38.7	37.3	36.2	36.3

Students with Disabilities

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3	368.9	27.9	27.4	27.8	26.2
Grade 4	376.0	27.7	29.0	27.6	26.9
Grade 5	399.9	32.2	30.3	30.9	30.0

N-Code Students

Grade/ Course	Mean Scaled Score	Number & Number Sense	Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
Grade 3	402.7	31.3	30.8	30.8	30.0
Grade 4	405.2	30.6	31.4	30.9	30.7
Grade 5	433.6	36.6	33.3	33.6	33.9

Virginia Assessment Program

Summary Report by Division

Students Tested: 247
Overall Mean Scaled Score: 359.7

Gr 7 Mathematics

Form: M--22 **Core: 2**

Reporting Category: Number, Number Sense, Computation and Estimation — **Mean Scaled Score: 26.3**

Description of Question	% Correct In Division
Solve a problem involving addition or subtraction of integers.	43
Recognize a square root of a perfect square.	73
Add, subtract, multiply, and divide integers.	67
Compare and order numbers represented as fractions, decimals, percents, or numbers written in scientific notation.	57
Represent the equivalent forms for fractions, decimals, percents, or numbers written in scientific notation.	43
Compare numbers written in different forms.	24
Evaluate an expression using order of operations.	23
Represent arithmetic or geometric sequence using variable expressions.	78
Represent equivalent relationships between number sentences and models of addition, subtraction, multiplication, or division of integers.	79
Use proportional reasoning to solve single- and multi-step practical problems.	38
Identify absolute value of a rational number.	79
Use proportional reasoning to solve single- and multi-step practical problems.	43
Describe the relationship between two consecutive terms in an arithmetic or geometric sequence.	65
Represent numbers in exponential and expanded notation.	21
Represent equivalent relationships between number sentences and models of addition, subtraction, multiplication, or division of integers.	58
Use proportional reasoning to solve single- and multi-step practical problems.	55

Reporting Category: Measurement and Geometry — **Mean Scaled Score: 26.5**

Description of Question	% Correct In Division
Describe or solve practical problems where an attribute of the figure has been changed.	64
Calculate the volume of a cylinder.	64
Apply a transformation to the graph or coordinates of a figure and determine the graph or coordinates for the image.	51
Use properties and proportions of quadrilaterals and triangles to determine corresponding sides and angles of similar figures.	67
Use properties to compare and contrast quadrilaterals.	14
Recognize the dilation of a given figure on a coordinate grid.	33
Analyze and extend a geometric sequence.	70
Use properties and proportions of quadrilaterals and triangles to determine corresponding sides and angles of similar figures.	65
Use properties to determine corresponding sides and angles of similar figures.	65
Classify a given quadrilateral.	32
Use the dimensions of rectangular prisms or cylinders to describe or compare volume and surface areas.	46
Apply a transformation to the graph or coordinates of a figure and determine the graph or coordinates for the image.	48
Use proportions to find missing measurements of congruent figures.	48

Gr 7 Mathematics (continued)

Form: M--22 **Core: 2**

Reporting Category: Probability, Statistics, Patterns, Functions, and Algebra

Mean Scaled Score: 25.1

Description of Question	% Correct In Division
Solve one-step inequalities in one variable.	37
Use the Fundamental Counting Principle to determine the probability of compound events.	20
Construct a histogram using data.	77
Apply or describe the experimental and theoretical probability formulas to determine or calculate the probability of a compound event.	36
Evaluate algebraic expressions for the given replacement values of the variables.	47
Determine the probability of a compound event.	37
Solve practical problems involving one-and two-step linear equations.	57
Given an algebraic expression, identify properties of operations applied between steps.	31
Solve one- and two-step linear equations.	75
Make inferences and comparisons for data sets displayed using different graphical representations.	62
Translate an algebraic expression or equation to a verbal expression or sentence and vice versa.	41
Solve one-step inequalities in one variable.	23
Represent relations with tables, graphs, rules, and words.	0
Determine the expected number of times an event will occur.	50
Translate an algebraic expression or equation to a verbal expression or sentence and vice versa.	52
Use the Fundamental Counting Principle to determine the probability of compound events.	45
Given an algebraic expression, identify properties of operations applied between steps.	49
Solve and graph inequalities in one variable.	20
Construct and analyze histograms for a given data set.	19
Solve one- and two-step linear equations.	64
Represent relations with tables, graphs, rules, and words.	35

SEARCHING FOR OPPORTUNITIES

Record the Overall Mean Scaled Score from 2013: _____

What will the Overall Mean Scaled Score be in 2014? _____

Record the Reporting Category Mean Scaled Score from 2013:

NNS		CE		MG		PS/PFA	
#Items	MSS	# Items	MSS	# Items	MSS	# Items	MSS

Which Reporting Categories are the greatest opportunities for improving student achievement in 2013 – 2014? Explain (include a discussion of the objectives).

Gr 7 Mathematics

Subgroups	Tests Administered #	Tests Administered %	Percent Passing	Total Mean Scaled Score	Reporting Category Mean Scaled Score 1	2	3					No Score	Fall/ Below Basic #	Fall/ Below Basic %	Fall/ Basic #	Fall/ Basic %	Pass/ Proficient #	Pass/ Proficient %	Pass/ Advanced #	Pass/ Advanced %
GENDER																				
Female	114	45	21.05	365.9	26.8	27.6	25.6						22	19	68	60	24	21	0	0
Male	139	55	16.55	352.6	25.7	25.4	24.5						43	31	73	53	23	17	0	0
STUDENTS WITH DISABILITIES	81	32	7.41	331.6	23.6	22.9	22.3						41	51	34	42	6	7	0	0
SOA ADJUSTMENT	9	4	0.00	355.0	24.8	24.8	26.1						3	33	6	67	0	0	0	0
RECOVERY	144	57	4.17	338.5	24.1	24.1	22.8						54	38	84	58	6	4	0	0
N-CODE	196	77	16.33	355.4	25.8	26.0	24.8						55	28	109	56	32	16	0	0
RETEST	0	0	0.00	0.0	0.0	0.0	0.0					0	0	0	0	0	0	0	0	0
D-CODE	0	0	0.00	0.0	0.0	0.0	0.0						0	0	0	0	0	0	0	0
RACE/ETHNICITY																				
Ethnicity: Hispanic: Yes																				
One Race																				
American Indian or Alaska Native	0	0	0.00	0.0	0.0	0.0	0.0						0	0	0	0	0	0	0	0
Asian	0	0	0.00	0.0	0.0	0.0	0.0						0	0	0	0	0	0	0	0

Gr 7 Mathematics

Subgroups	Tests Administered #	Tests Administered %	Percent Passing	Total Mean Scaled Score	Reporting Category Mean Scaled Score 1	2	3					No Score	Fall/ Below Basic #	Fall/ Below Basic %	Fall/ Basic #	Fall/ Basic %	Pass/ Proficient #	Pass/ Proficient %	Pass/ Advanced #	Pass/ Advanced %
RACE/ETHNICITY **Ethnicity: Hispanic: No One Race**																				
Asian	0	0	0.00	0.0	0.0	0.0	0.0						0	0	0	0	0	0	0	0
Black or African American	125	49	15.20	353.9	26.1	26.1	24.1						29	23	77	62	19	15	0	0
White	115	45	23.48	364.5	26.5	26.9	25.9						32	28	56	49	27	23	0	0
Native Hawaiian/Other Pacific Islander	0	0	0.00	0.0	0.0	0.0	0.0						0	0	0	0	0	0	0	0
Combination of Two Races American Indian/Alaska Native and Asian	0	0	0.00	0.0	0.0	0.0	0.0						0	0	0	0	0	0	0	0
American Indian/Alaska Native and Black or African American	0	0	0.00	0.0	0.0	0.0	0.0						0	0	0	0	0	0	0	0

Reporting Categories:

1 = Number, Number Sense, Computation and Estimation

2 = Measurement and Geometry

3 = Probability, Statistics, Patterns, Functions, and Algebra

Grade 7

Grade/ Course	Mean Scaled Score	Number & Number Sense Computation & Estimation	Measurement & Geometry	Probability & Statistics/Patterns, Functions, Algebra
All	**359.7**	**26.3**	**26.5**	**25.1**
Black	**353.9**	**26.1**	**26.1**	**24.1**
White	**264.5**	**26.5**	**26.9**	**25.9**
SWD	**331.6**	**23.6**	**22.9**	**22.3**
N-Code	**355.4**	**25.8**	**26.0**	**24.8**

Diagnostic Assessments

- Does the data reveal any needs across groups of students?
- Does the data identify needs of individual students?
- Do staff members use the data analysis to identify areas of opportunity to improve student achievement and ways to ‘fix-it’?
- Do staff members use multiple sources of data to identify specific opportunities for individual students? Is data analysis used to track progress?
- Is the student involved in setting and achieving learning goals based on data?
- Are the parents/guardians involved in setting and achieving learning goals based on data?

Student Performance Profile
and
Student Test Item Analysis

Key Questions:

- Do the benchmark test results reveal any specific areas of weakness in the student's mastery of the **content** contained in the curriculum framework? (e.g. representing fractions)
- Do the benchmark test results reveal any specific areas of weakness in the student's ability to use specific **thinking skills** contained in the curriculum framework? (e.g. compare the magnitude of…)
- Do the benchmark test results reveal any specific areas of weakness in the student's ability to use specific **vocabulary** contained in the curriculum framework? (e.g. compare the magnitude of…)
- Do the benchmark test results reveal any specific areas of weakness in the student's ability to use specific **thinking skills** contained in the curriculum framework? (e.g. compare the magnitude of…)
- Do the benchmark test results reveal any specific areas of weakness in the student's ability to use specific **reading comprehension** strategies of informational text? (e.g. little to no use of highlighter)
- Does your classroom assessment of this student verify the benchmark indicators of concern?
- What intervention strategies can be used to assist this student gain a better understanding of the content or ability to apply the thinking skill?
- What other resources can be used to assist the student? (e.g. after-school remediation, intersession, resource teacher)

Student Name: _____ **Subject:** _____

Focus Area for Improvement	Intervention Strategy

Classroom Performance Profile
and
Classroom Test Item Analysis

Key Questions:

- Do the benchmark test results reveal any specific areas of weakness in mastery of the **content** already 'learned' in your class and contained in the curriculum framework? (e.g. spelling)
- Do the benchmark test results reveal any specific areas of weakness in the ability of the students in your class to use specific **thinking skills** contained in the curriculum framework? (e.g. analyze the author's purpose)
- Do your classroom assessments of these content/thinking skills verify the benchmark indicators of concern?
- Do the benchmark test results reveal any specific areas of weakness in the ability of students' to use specific **vocabulary** contained in the curriculum framework? (e.g. compare the magnitude of…)
- Do the benchmark test results reveal any specific areas of weakness in the students' ability to use specific **reading comprehension** strategies of informational text? (e.g. little to no use of highlighter)
- Do the benchmark results reveal a learning gap based on subgroup? (e.g., poverty compared to non-poverty students)
- What intervention strategies can you use to assist students in your class gain a better understanding of the content or ability to apply thinking skills?
- What other resources can be used to assist the students in your class? (e.g. curriculum leader, teacher content specialist, instructional leader, fellow teacher, administrator)

Class: _____ **Subject:** _____

Focus Area for Improvement	Intervention Strategy

School Performance Profile
and
School Test Item Analysis

Key Questions:

- Do the benchmark test results reveal any specific areas of weakness in students' mastery of the **content** already 'learned' in your school and contained in the curriculum framework? (e.g. representing fractions)
- Do the benchmark test results reveal any specific areas of weakness in the ability of the students in your school to use specific **thinking skills** contained in the curriculum framework? (e.g. compare)
- Do the benchmark test results reveal any specific areas of weakness in the ability of students' to use specific **vocabulary** contained in the curriculum framework? (e.g. compare the magnitude of…)
- Do the benchmark test results reveal any specific areas of weakness in students' ability to use specific **reading comprehension** strategies of informational text? (e.g. little to no use of highlighter)
- Do the benchmark results reveal a learning gap based on subgroup? (e.g., poverty compared to non-poverty students)
- Do your school-wide classroom assessments of this content/thinking skill/vocabulary/reading verify the benchmark indicators of concern?
- What intervention strategies can be used to assist the students in your school gain a better understanding of the content or ability to apply the thinking skill?
- What other resources can be used to assist the students in your school? (e.g curriculum leader, teacher content specialist, instructional leader)

Student Name: _____ **Subject:** _____

Focus Area for Improvement	Intervention Strategy

Sample SOL Scrimmage
Dan Mulligan, flexiblecreativity.com **VERSION: 1.0**

Benchmark/EKS: I can multiply a fraction or a whole number by a fraction and use a visual fraction model to represent the equation.

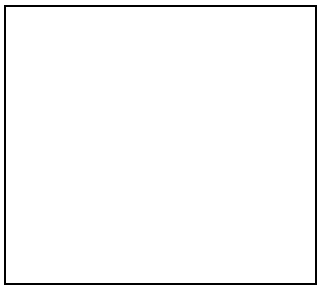
Read carefully and follow the directions: SHOW YOUR THINKING!

1. Alice drank $\frac{3}{4}$ of a $\frac{1}{2}$ gallon of chocolate milk.

   How much of a whole gallon did she drink? Write your answer in simplest form.

Answer: _____

Draw lines and shade in the rectangle to represent the fraction.

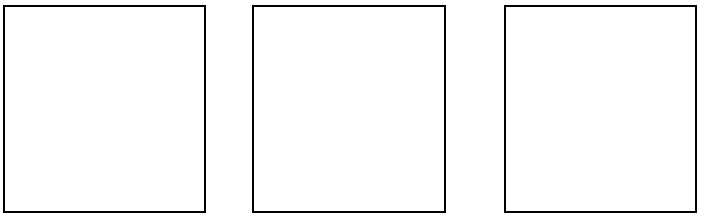


2. Multiply. Write your answer in simplest form:

$\frac{1}{4}$ x 3 =

Answer: _____

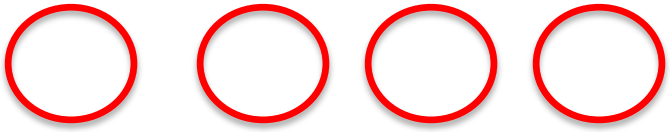
Draw lines and shade in the squares to represent the product.



3. Create a multiplication problem of a fraction and whole number.

Problem: _____

Shade the circles to represent the problem.



4. Multiply. Write your answer in simplest form.

$\frac{5}{6}$ x $\frac{2}{3}$

Answer: _____

Use the rectangle below to represent the problem.

Explain your thinking.

Sample SOL Scrimmage
Dan Mulligan, flexiblecreativity.com VERSION: 2.0

Benchmark/EKS: I can

Read carefully and follow the directions: SHOW YOUR THINKING!

The chart below tells the lengths of six different rivers from around the world. Use the lengths to complete the activities below the chart.

Name of river	Nile	Columbia	Mekong	Danube	Volga	Amazon
Length in miles	4,132 miles	1,450 miles	2,705 miles	1,795 miles	3,645 miles	3,976 miles

1. Fill in the blanks so each statement is true.

The value of 7 in the Danube's length is ten times the value of the 7 in which river's length? _____

The value of 5 in which river's length is ten times the value of the 5 in the Volga's length.

The value of which river's length is ten times the value of the same digit in the Danube's length.

2. Which of the expressions below is equivalent to the 4 in the Columbus River?

Place a ☐ next to all that apply.

___ 400 x 10 ___ 4,000 x 10

___ 4 x 100 ___ 40 x 10

___ 400 ÷ 10 ___ 4,000 ÷ 10

3. Circle each length that has a 6 that is worth ten times as much as the 6 in the Volga's length.

26,175 miles 9,062 miles 64,582 miles

6,419 miles 40,678 miles

4 Explain how you used what you know about place value to help answer the questions in numbers 1 – 3.

Sample SOL Scrimmage
Dan Mulligan, flexiblecreativity.com VERSION: 1.0

Benchmark/EKS: I can

Read carefully and follow the directions: SHOW YOUR THINKING!

2. Compare the values of each 7 in the number 771,548. Use pictures, numbers and words to explain.	3. Norfolk State University's Football Stadium has a seating capacity of 31,452. According to the 2010 census, the population of San Jose, CA was approximately ten times the amount of people that NSU's stadium can seat. What was the population of San Jose in 2010? Explain your reasoning.
4. How is the digit 2 in the number 582 similar to and different from the digit 2 in the number 528?	5. Tonya was practicing her multiplication with the following facts: 9 x 10 = 90, 13 x 10 = 130, 456 x 10 = 4,500 She noticed that every time she multiplied by ten there was a zero at the end of each number. Explain to Tonya why there is a zero at the end of a number when it is multiplied by 10.

CELEBRATE THE STRUGGLE! – THE MATHEMATICS EDITION

RIGOR = TYPE OF THINKING +DEPTH OF THINKING

Depth + Type of Thinking	Level 1 Recall & Reproduction	Level 2 Basic Skills & Concepts	Level 3 Strategic Thinking & Reasoning	Level 4 Extended Thinking
Remember A	Recall facts, terms, formulas, conversions			
Understand B	Solve a one-step problem	Use models/diagrams to explain concepts	Use concepts to solve non-routine problems	Develop generalizations of the strategies used and apply to new situations
Apply C	Apply algorithm or formula	Select a procedure and perform it	Use reasoning, planning, and evidence	Design and conduct a project that specifies a problem, identifies solution paths, solves the problems, and reports results
Analyze D	Identify a pattern and trend	Organize and display data	Generalize a pattern	Analyze multiple sources of evidence or data sets
Evaluate E			Compare/contrast solution methods	Apply understanding in a novel way, provide justification for the new application
Create F	Brainstorm ideas related to a topic	Generate conjectures based on observations or prior knowledge	Develop an alternative solution	Design a model to solve a practical or abstract situation

Depth + Type of Thinking	Level 1 Recall & Reproduction	Level 2 Basic Skills & Concepts	Level 3 Strategic Thinking & Reasoning	Level 4 Extended Thinking
Remember A				
Understand B				
Apply C				
Analyze D				
Evaluate E				
Create F				

Using the Cognitive Rigor Matrix to Align Items to Required Student Thinking

Grade 6

1. A ship must average 22 miles per hour to make its ten-hour run on time. During the first four hours, bad weather caused it to reduce speed to 16 miles per hour. What should its speed be for the rest of the trip to keep the ship to its schedule?

Grade 3

2. Put the circles below into eight equally sized groups and write an equation to represent the picture.

o o o o o o o o o o o o o o o o o o o o o o o o o o

Grade 7

3. During an experiment, three coins were tossed once.

   Part A: Give the sample space to show all possible outcomes for tossing three coins one time, using the letter H when a coin faces "heads" up, and the letter T when it faces "tails" up.

   Part B: Based on your answer to part A, how many outcomes consist of 3 heads or 3 tails?

   Part C: During a math class, each of 24 students tossed three coins once. Based on your answer to part B, how many students would you expect to get a result of 3 heads or 3 tails?

Grade 1

4. How long is the pencil in terms of paper clips?

Grade 1

5. How long is the pencil in terms of paper clips? Explain to your teacher how you will measure the pencil. Why do you think your plan will work?

Geometry

6. Answer the question in this part. A correct answer will receive 6 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. A correct numerical answer with no work shown will receive only 1 credit. The answer should be written in pen, except for graphs and drawings, which should be done in pencil.

   The vertices of quadrilateral JKLM have coordinates *J*(-3,1), *K*(1,–5), *L*(7,-2), and *M*(3,4).

   a. Prove that *JKLM* is a parallelogram.
   b. Prove that *JKLM* is not a rhombus.

   [The use of the set of axes below is optional.] *Graph not included saving space.*

Grade 5

7. A line of symmetry can be drawn on only two of the figures below.

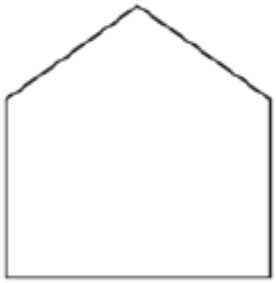


Figure A

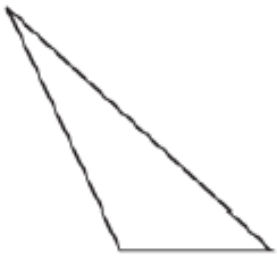


Figure B

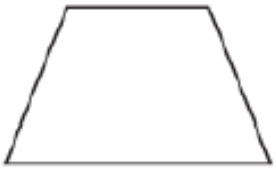


Figure C

Figure D

   a. Draw a line of symmetry on the two figures.
   b. On the lines below, explain how you determined your answer.

Lines not included saving space.

Grade 4 (Virginia DOE released)

8. Click on (circle) each measurement you want to select. You must select each correct measurement.

Identify each measure that is equivalent to 12 feet.

120 inches	**4 yards**
36 yards	**144 inches**

Kindergarten

9. How many **hearts** are there? Show and explain how you know. Is there another way you can do this?

Algebra I

10. If $A = 3x^2 + 5x - 6$ and $B = -2x^2 - 6x + 7$, then A - B equals

(1) $-5x^2 - 11x + 13$

(2) $5x^2 + 11x - 13$

(3) $-5x^2 - x + 1$

(4) $5x^2 - x + 1$

Grade 5

11. a. Find the next three terms in the pattern.
    b. Determine the rule for finding the next number in the pattern.
    c. Make or find a model for the pattern. Explain your model.

1, 1, 2, 3, 5, 8, 13, 21, 34

Item Investigation Work Zone: