

Math Interventions and AIMSweb Data Collection

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Objectives

- * AIMSweb math measures will be described and guidelines for using that data to make decisions will be explained.
- * Various math interventions will be explored and discussed.

RtI Tiered Instruction

► Tier 1: Benchmark

School-wide research supported instruction is available to all students. All students are benchmarked using a universal tool based on standard aligned concepts. (AIMSweb)

► Tier 2: Strategic

Academic methodologies and practices for those students not making expected progress. These students are at risk for academic failure. (At and below the 25th percentile)

► Tier 3: Intensive Interventions

Academic methodologies and practices designed for students significantly lagging behind grade level benchmarks. (At and below the 10th percentile)

Practice Guide Recommendations

(Witzel, 2013)

1. Screen ALL students to identify those who need interventions
2. Intervention instruction should focus on explicit and systematic instruction.
3. Teach common underlying structures to word problems.
4. Include visual representations of mathematical ideas.
5. Devote at least 10 minutes to fluent fact retrieval.
6. Monitor progress of those receiving intervention as well as those at risk.
7. Include motivational strategies in Tier 2 and Tier 3 interventions to prevent the Can't Do/Won't Do.

AIMSweb Math Assessments:

- ▶ TEN (Test of Early Numeracy) Grades K & 1
- ▶ M-Comp (Math Computation) Grades 1-5
- ▶ M-CAP (Math Concepts and Application) Grades 2-5

TEN (Test of Early Numeracy)

- ▶ All one-minute measures are administered individually using standardized instructions. Each of the four measures is recommended for grades K and 1 to be given at each benchmark period. Specific scoring instructions and prompts are described in the manual. The TEN can be administered with browser-based scoring as is done with the reading probes.

Test of Early Numeracy (TEN) includes the following four subtests:

- ▶ **Oral Counting** - Students are asked to orally count from 1-100. No visuals!
- ▶ **Number Identification** - Students are given a sheet with numbers and are asked to name them in order. The probe for kindergarten students includes the numbers 1-10 arranged randomly and the first grade probe includes the numbers 1-20.
- ▶ **Quantity Discrimination** - This measure asks students to determine which number, out of the pair, is bigger. Kindergarten probes include numbers 1-10; first grade 1-20.
- ▶ **Missing Number** - Students are asked to determine which number out of the string of three is missing. The number may be found at the beginning, middle, or end of the string. Again, kindergarten probes include numbers 1-10 and first grade numbers 1-20.

M-Comp (Math Computation)

Grades 1-5

- ▶ This measure can be administered individually, in a small-group, or with the entire class. The probe takes eight minutes and is scored using a key which indicates the most correct answers and the point value of the items. All portions of the problem must be correct for the student to receive the point(s). Specific scoring instructions are provided in the manual, along with the standardized instructions for administration. Visual aids are not permitted; they must be either removed or covered. The use of scratch paper is allowable, but likely unnecessary, since there is room on the paper to work the problems. Below is information describing the kinds of problems found on this measure:
- ▶ **Grades 1-3** - column addition, basic facts, complex computations
- ▶ **Grade 4** - basic facts, complex computations, decimals, fractions
- ▶ **Grade 5** - basic facts, complex computations, decimals, fractions, conversions, percentages

M-CAP (Math Concepts and Application)

Grades 2-5

- ▶ This measure can also be administered individually, in a small-group, or with the entire class. The probe takes eight minutes and is scored using a key which indicates the most correct answers and the point value of the items. All portions of the problem must be correct for the student to receive the point(s). Specific scoring instructions are provided in the manual, along with the standardized instructions for administration. Visual aids are not permitted; they must be removed or covered. The use of scratch paper is allowable, but likely unnecessary, since there is room on the paper to work the problems.
- ▶ For grades 2-5, M-CAP measures number sense, operations, patterns and relationships, measurement, geometry, and data and probability. Grade 5 probes also include algebra.

So, Where do we start?

- ▶ Always start with Tier I. The whole class should be benchmarked. If their score is at or below the 25th percentile (yellow or red) then it is necessary to consider implementing interventions.
- ▶ For those students at or below the 25th percentile; begin a Tier II intervention. Tier II math interventions should focus on skill acquisition or fluency building.
- ▶ For those students at or below the 10th percentile, conduct SLA, and then determine progress monitor level. Begin a Tier III intervention. Tier III interventions should focus on fluency for the first 5-10 minutes, and then move into conceptual understanding.

Progress Monitoring

- ▶ For those students in Tier II or Tier III interventions, progress monitoring (PM) needs to be completed in order to determine intervention success.
- ▶ Students may need to be given a Survey-Level Assessment (SLA) to determine the appropriate grade level to monitor their progress.
- ▶ Progress monitoring should be done on a regular basis. Those in Tier III interventions are likely monitored more frequently, such as weekly.
- ▶ SLA and PM can be administered as a group.

Math Intervention Skill Sequence (VanDerHeyden)

1ST GRADE

1. addition/sums to 6 flash cards
2. addition/sums to 12 flash cards
3. subtraction 0-5 flash cards
4. addition/sums to 18 flash cards
5. subtraction 0-9 flash cards
6. fact families addition/subtraction 0-9 practice set - same as skill

Skill Sequence Continued...

2ND GRADE

1. addition facts 0-20 flash cards
2. subtraction facts 0-9 flash cards
3. subtraction facts 0-12 flash cards
4. subtraction facts 0-15 flash cards
5. subtraction facts 0-20 flash cards
6. mixed subtraction/addition 0-20 flash cards
7. fact families addition and subtraction 0-20 practice set - same as skill
8. 2 digit addition without regrouping practice set - same as skill
9. 2 digit addition with regrouping practice set - same as skill
10. 2 digit subtraction without regrouping practice set - same as skill
11. 2 digit subtraction with regrouping practice set - same as skill
12. 3 digit addition without and with regrouping practice set - same as skill
13. 3 digit subtraction without and with regrouping practice set - same as skill
14. 2nd Grade Monthly math probe practice set - same as skill

Skill Sequence Continued...

3RD GRADE

1. addition and subtraction facts 0-20 flash cards
2. fact families addition and subtraction 0-20 practice set - same as skill
3. 3 digit addition without and with regrouping practice set - same as skill
4. 3 digit subtraction without and with regrouping practice set - same as skill
5. 2 and 3 digit addition and subtraction practice set - same as skill
with and without regrouping
6. multiplication facts 0-9 flash cards
7. division facts 0-9 flash cards
8. fact families multiplication and division 0-9 practice set - same as skill
9. add/subtract fractions with like denominators practice set - same as skill
(3rds, 4ths, 8ths, 10ths, no regrouping)
10. single digit multiplied by double/triple digit practice set - same as skill
without regrouping
11. single digit multiplied by double/triple digit practice set - same as skill
with regrouping
12. single digit divided into double/triple digit practice set - same as skill
without remainders
13. add and subtract decimals to the hundredths practice set - same as skill

Skill Sequence Continued...

4TH GRADE

1. multiplication facts 0-12 flash cards
2. division facts 0-12 flash cards
3. fact families multiplication/division 0-12 practice set - same as skill
4. single digit multiplied by double digit practice set - same as skill
with and without regrouping
5. double digit multiplied by double digit practice set - same as skill
without regrouping
6. double digit multiplied by double digit practice set - same as skill
with regrouping
7. single digit divisor into double digit dividend practice set - same as skill
without remainders
8. single digit divisor into double digit dividend practice set - same as skill
with remainders
9. single and double digit divisor into single and practice set - same as skill
double digit dividend with remainders
10. add/subtract fractions with like denominators practice set - same as skill
no regrouping
11. multiply multi-digit numbers by two numbers practice set - same as skill
12. add and subtract decimals to the hundredths practice set - same as skill

Skill Sequence Continued...

5TH GRADE

1. multiplication facts 0-12 flash cards
2. division facts 0-12 flash cards
3. fact families multiplication/division 0-12 practice set - same as skill
4. multiply 2 and 3 digit with practice set - same as skill
and without regrouping Vail Standard
5. single digit divisor divided into double practice set - same as skill
digit dividend with remainders
6. single digit divisor divided into double practice set - same as skill
and triple digit dividend with remainders
7. reduce fractions to simplest form practice set - same as skill
8. add/subtract proper fractions/mixed numbers practice set - same as skill
with like denominators with regrouping
9. add / subtract decimals practice set - same as skill
10. multiply / divide decimals practice set - same as skill
11. double digit divisor into 4 digit dividend practice set - same as skill
12. multiply and divide proper and improper practice set - same as skill
fractions

Math Computation Strategies

Tier 3

Addition	Subtraction	Multiplication	Division
Count Up	Count Back	0 Times a number is always 0.	You can't divide by 0
Tens Partners	Count Up	Times 1 equals the number.	A number divided by itself is 1.
Doubles	Think Addition	Times 2 is double the number.	A number divided by 1 equals the number.
Plus 10	Tens Partners	Times 3 is the number tripled.	A number divided by 2 is half the number.
Plus 9	Doubles	Times 4 is double Times 2.	Use multiplication to solve division problems.
Plus 8	Minus 10	Times 5 is like counting nickles.	
Add in Small Steps	Minus 9	Times 6 is double Times 3.	
Hidden Facts	Minus 8	Turn Times 7 into smaller multiplication facts.	
	Subtract in Small Steps	Times 8 is double Times 4.	
		Think Times 10 and subtract one group.	
		Put a 0 in the ones place to increase its value.	
		Make double digit products.	
		Times 12 = Times 10 + Times 2.	

Class-at-a-Glance Report

Common Core State Standards

Mathematics Concepts and Applications (M-CAP)

Teacher: Mr. Harrison - HomeRoom

Grade: 2

School: Adams Elementary

District: Washington

Fall 2012-2013

Local Norms: Adams Elementary

National Norms: AIMSweb National Norms

 Relative Strength*

 Relative Weakness**

Name	M-CAP Score (points earned)	Percentile Rank		Instructional Level	Performance by Domain Correct of attempted					Total Item Performance			
		Local Norms	National Norms		Common Core				Other	Accuracy	Correct	Attempted	Skipped
					Number & Operations in Base Ten (12 items)	Operations & Algebraic Thinking (5 items)	Geometry (1 item)	Measurement & Data (7 items)					
Ross, Colton	40	96	99	Well Above Average (90th to 99th %ile)	9 of 12	5 of 5	1 of 1	7 of 7	3 of 4	86%	25	29	1
Shipman, Barbara	33	87	99		7 of 12	3 of 5	1 of 1	7 of 7	3 of 4	72%	21	29	4
Bertram, Nicole	31	79	99		10 of 12	3 of 5	0 of 1	5 of 7	2 of 4	68%	20	29	3
Baker, Ryan	25	71	97		10 of 12	1 of 5	0 of 1	6 of 7	2 of 4	65%	19	29	3
Buhr, Megan	22	62	95		6 of 11	2 of 5	1 of 1	4 of 7	1 of 4	50%	14	28	6
Davis, Zachary	16	54	89	Above Average (75th to 89th %ile)	3 of 12	1 of 5	0 of 1	4 of 7	2 of 4	34%	10	29	5
Walker, Ashley	14	46	85		6 of 11	1 of 4	0 of 1	2 of 7	1 of 3	38%	10	26	15
Stendahl, Kyle	11	37	76		4 of 11	1 of 4	1 of 1	0 of 6	1 of 3	28%	7	25	15
Alsaker, Jesse	9	29	68	Average (25th to 74th %ile)	4 of 6	0 of 2	0 of 0	2 of 5	1 of 1	50%	7	14	3
Wilkerson, Tayler	5	17	41		2 of 3	0 of 1	0 of 0	3 of 3	0 of 0	71%	5	7	0
Dugas, Victoria	5	17	41		1 of 11	0 of 5	0 of 1	3 of 7	0 of 4	14%	4	28	8
Berg, Chelsea	2	4	13	Below Average (10th to 24th %ile)	1 of 8	0 of 2	0 of 1	1 of 6	0 of 2	10%	2	19	4

Mathematics Concepts and Applications (M-CAP)

Student: Ryan Baker

Fall 2012-2013

M-CAP Fall Score: 25 (points earned)

Teacher: Mr. Harrison

Percentile Rank:

Grade: 2

National Aggregate Norms: 97

School: Adams Elementary

Adams Elementary Norms: 71

District: Washington

Recommended enVisionMATH Instructional Level: Advanced

 Relative Strength*

 Relative Weakness**

Item #	Skill Assessed	Performance	Accuracy (% correct of attempted)	Pearson Instructional Resources Instructional resources available for related skill		
				enVisionMATH Common Core © 2012		focusMATH
				Corresponding Lesson	Related Lesson	Corresponding Step
Number & Operations in Base Ten - Relative Strength						
2	Compare numbers	Correct	83%	10-8	10-7	Grade 2 Book A,Steps 3-6 and 3-7
5	Add three numbers	Correct		2-5	2-4	Grade 2 Book B,Step 1-9
7	Decide to add or subtract to solve problems	Correct		1-7	1-3	Grade 1 Book A,Step 5-7
8	Count by twos	Correct		6-6	Grade 1: 7-5	Grade 2 Book A,Step 2-5
9	Count by threes	Incorrect		6-6		
12	Compare numbers	Correct		10-7	5-3	Grade 2 Book A,Step 3-6
15	Decide to add or subtract to solve problems	Correct		1-7	1-1	Grade 1 Book A,Step 5-7
18	Identify place value	Correct		10-2		Grade 2 Book A,Step 3-2
20	Compare numbers	Correct		10-7	5-3	Grade 2 Book A,Step 3-6
22	Identify place value	Correct		10-2		Grade 2 Book A,Step 3-2
24	Write the standard form of a number	Correct		10-3	10-2	Grade 2 Book A,Step 3-2
29	Add multiples of 100 to a number	Incorrect		10-4	11-2	
Operations & Algebraic Thinking - Relative Weakness						
4	Solve problems involving joining	Skipped	20%	1-2	1-1	Grade 2 Book B,Step 1-1
10	Solve problems involving separating	Incorrect		1-4	1-3	Grade 2 Book B,Step 2-1
23	Solve problems involving comparing	Skipped		1-5	1-3	Grade 2 Book B,Step 2-2
25	Subtract two-digit numbers	Correct		9-5	9-4	Grade 2 Book B,Step 5-3
27	Solve problems involving sharing	Incorrect		Step-Up 2		
Geometry						
16	Identify plane shapes	Incorrect	0%	12-3		
Measurement & Data - Relative Strength						
1	Measure length in inches	Correct	86%	15-2	15-4	Grade 2 Book C,Step 3-2
3	Measure height in inches	Correct		15-2	15-4	Grade 2 Book C,Step 3-2
6	Interpret data from a bar graph	Correct		16-6	16-3	
11	Count money	Correct		13-1		
13	Tell time	Correct		16-1		
19	Count money	Correct		13-4	13-1	
26	Tell time	Incorrect		16-1		
Other						
14	Use ordinal numbers	Correct	50%		Grade K: 2-8	Grade K Step 1-7
17	Find fractions of a set	Correct		Step-Up 7		

M-CAP Info-Graph

Use the AIMSweb *Math Instructional Reference Guide*

[illegible]

Websites

- ▶ www.interventioncentral.org
- ▶ www.aimsweb.com
- ▶ www.gosbr.net/math
- ▶ www.insidemathematics.org
- ▶ www.illuminations.nctm.org

References

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- ▶ Leier, Jill. (2013) Developing Number Sense with Struggling Math Learners. Retrieved from leier@west-fargo.k12.nd.us.
- ▶ VanDerHeyden, Amanda. (2014) Tier 2 and 3 Math Interventions. Retrieved from Gosbr.net.
- ▶ Witzel, B. (2009) *Assisting students struggling with mathematics: Response to intervention (RTI) for elementary and middle schools (NCEE 2009-4060)*. Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education. Retrieved from <http://ies.ed.gov/ncee/wwc/>.