Math Progress Monitoring: Measures, Goal Setting, and Data-Based Decision Making in Math



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Math Progress Monitoring Measures

Goal Setting

Decision Making



Intensive Intervention



Almost 100% of students



TIER Computational Fluency Progress Monitoring



Progress Monitoring Measures

Kindergarten	Quantity & Number Sequence				
Grade 1	Quantity Comparison & Addition and Subtraction				
Grade 2	Computation				
Grade 3	Computation				
Grade 4	Computation				
Grade 5	Computation				
Grade 6	Computation				



Kindergarten



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The Kindergarten measure is 2 pages.

This first page focuses on Quantity.

Students have 1 min on this side.

T₁F_R

Kindergarten



The Kindergarten measure is 2 pages.

This second page focuses on *Number Sequence*.

Students have 1 min on this side.

T₁F_R

2

Kindergarten



T-I-E-R

2

							TIER: Grade	1, Quantity Com	parison Form
me						Date			
Look a	t the number	rs and circle v	which is great	ter or bigger.					
28	9	46	75	87	16	35	101	37	18
8	25	67	74	47	94	45	36	105	58
91	63	16	35	110	35	32	64	93	92
89	102	75	58	71	93	76	28	105	115

The Grade 1 measure is 2 pages.

This first page focuses on *Quantity Comparison*.

Students have 1 min on this side.

T[·]I[·]E[·]R

TIER: Grade 1, Addition and Subtraction Form 1

Correct	Incorrect

Write the answer for each problem. If you don't know how to work the problem, put an X over it and move to the next problem.

6 + 4 =	3+=9	8 – 1 =	4 + 0 =	+ 4 = 12
19 - 11 =	10 = 3	6 = 11	8 - 4 =	11 + 8 =
4 + 2 + 5 =	11 – 5 =	10 + 5 =	10 = 8	- <u>7</u>
15 = 2	8 + 1 =	4	4 + 5 =	6+5=+4

The Grade 1 measure is 2 pages.

This second page focuses on Addition and Subtraction.

Students have 1 min on this side.



TIER: Grade 1, Quantity (Comparison Form 1
Look at the numbers and circle which is greater or bigger.	TIER: Grade 1, Addition and Subtraction Form 1
28 9 46 (75) (87) 16 35 (101) (37)	Write the answer for each problem. If you don't know how to work the problem, put an X over it and move to the next
	6+4=
8 25 67 74 47 94 45 36 (105	
	19 - 11 = 10 = 3 6 = 11 8 - 4 = 11 + 8 =
91 63 16 (35) (110) 35 32 64 93	8 7 17 4 19
	4+2+5= 11-5= 10+5= 10=8 13 7
89 (102) (75) 58 (71) (93) (76) 28 (105)	11 6 15 18 6
	- 15 - 2 8 + 1 = 4 + 5 = 6 + 5 = + 4
w2021 The University of Lexas System/Texas Education Agency, Licensed under CC-BY-ND-NC 4.0 International.	13 9 14 9 7

				TIER: 0	Grade 2, Form
				Correct	Incorrect
Name			Date		
Write the answer for eac missing number. If you d	h problem. Some problem on't know how to work the	s will give you a list of nur e problem, put an X over it	nbers with a blank. Fill in t t and move to the next pro	he blank with blem.	the
8 + 9	5 <u>-3</u>	- <u>7</u>	21, 22,, 24	64 -	- 20
19 <u>- 13</u>	40 23 <u>+ 18</u>	32. 31,, 29	46 <u>+ 37</u>	90 <u>- 20</u>	
50 <u>- 38</u>	9 - 2	20 27 <u>+ 10</u>	16+2	443, 442, 441,	
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The Grade 2 measure is 2 pages.



				TIER: Grade 2, Form 1		
				Correct Incorrect		
Write the answer for eac	h problem. Some problem	s will give you a list of nun	nbers with a blank. Fill in t	he blank with the		
missing number. If you d	on't know how to work the	e problem, put an X over it	t and move to the next pro	oblem.		
20 + 40 + 10	74	30 + 20	30 + 25 + 41 + 73	30 + 15		
	<u>- 40</u>					
5+8	93 - 26	225, 226, 227,	20 + 40 + 60 + 38	12 + 6		
27 + 33 + 26 + 45	9 + 10	60 - 24	50 - 30	<u>18</u>		
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The Grade 2 measure is 2 pages.



				TIER: Grad	e 2, Form 1				
		KEY							
Write the answer for each missing number. If you do	h problem. Some problem	s will give you a list of nur problem, put an X over i	nbers with a blank. Fill in t	he blank with t					TIER: Grade 2, Form 1
8+9	5	20	21, 22,, 24	64 - 2	Write the answer for each	problem. Some problem	KEY	nhers with a blank. Fill in t	he blank with the
	- 3	<u> </u>			missing number. If you do	on't know how to work the	e problem, put an X over i	t and move to the next pro	iblem.
17	2	13	23	44	20 + 40 + 10	74 - 40	30 + 20	30 + 25 + 41 + 73	30 + 15
19 <u>- 13</u>	40 23 + 18	32. 31,, 29	46 <u>+ 37</u>	9(<u>- 2(</u>	70	38	50	169	45
6	81	30	83	70	5+8	93 - 26	225, 226, 227,	20 + 40 + 60 + 38	12+6
50 <u>- 38</u>	9 - 2	20 27 + 10	16+2	443, 442, 4	13	67	228	158	18
12	7	57	18	440	27 + 33 + 26 + 45	9+10	60 - 24	50 - 30	- <u>4</u>
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				l	©2021 The	e University of Texas System/T	exas Education Agency. License	ed under CC-BY-ND-NC 4.0 Inter	mational. 2

				TIER: Grade 3, Form 1
				Correct Incorrect
Name			Date	
Write the answer for eac	h problem. If vou don't kn	ow how to work the proble	em, put an X over it and m	ove to the next problem.
	,,			
90 × 5	467 <u>+ 257</u>	49 ÷ 7	(10÷2)+4	× 3 × 3
48÷6	767 <u>- 249</u>	40 ÷ = 5	9×7	(8 × 9) ÷ 6
80 ÷ 8	(5 × 10) + 2	(842 – 379) – 412	2×8	48÷=12

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The Grade 3 measure is 2 pages.

Students have 2 min on both pages.

1



The Grade 3 measure is 2 pages.



				TIER: Grade 4, Form 1
				Correct Incorrect
Name			Date	
Write the answer for each Don't skip around. Simpli	h problem. If you don't known ify fractions to their most of the sections to the section of the	ow how to work the proble common form.	em, put an X over it and m	ove to the next problem.
2)8	- 7,417 - 43.8	(55 × 7) +207	× 20	5×4
<u>+ 8,607</u>	(3 × 2) × 6	84 <u>× 23</u>	4)4,880	130 × 4
24 × 6	4,317 <u>+ 48.8</u>	2)40	3,648 ÷ 6 ÷ 2	3)9,042
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The Grade 4 measure is 2 pages.





The Grade 4 measure is 2 pages.



				TIER: G	irade 5, Form 1
Namo			Data	Correct	Incorrect
Write the answer for eac	h problem. If you don't kn	ow how to work the proble	em put an X over it and m	ove to the ne	vt problem
Don't skip around. Simpli	ify fractions to their most o	common form.		love to the he	xt problem.
× 90 × 90	$\frac{8}{15} + \frac{3}{5}$	14 546	$\frac{1}{9} \div 40$	× 4	97 <u>30</u>
15/45	$2\frac{7}{10} - 2\frac{9}{20}$	42]3,654	$\frac{4}{9} + \frac{2}{7}$	56 <u>+ 26</u>	5.81 5.15
363 × 43	$\frac{18}{25} - \frac{4}{50}$	7.964 - 6.158	36]1,026	18 ÷	<u>1</u> 15
©2021 TI	l ne University of Texas System/T	l Texas Education Agency. License	l ed under CC-BY-ND-NC 4.0 Inter	rnational.	1

The Grade 5 measure is 2 pages.



				TIER: Grade 5, Form 1	
				Correct Incorrect	
Write the answer for eacl Don't skip around. Simpli	h problem. If you don't kno ify fractions to their most o	ow how to work the proble common form.	em, put an X over it and m	ove to the next problem.	
380	1.52	785 × 57	$\frac{21}{42} - \frac{4}{42}$	$\frac{1}{42} \div 56$	
<u>× 32</u>	× 0.4		12 12	18	
18 450	24	42 11 15 5	0.24	6,3	
	<u>× 3.6</u>	43 12 - 15 8	<u>× 3.6</u>	$\overline{4}$ $\overline{4}$	
16 36	-1 -3	- 1	41 4 305	25 495	
10,50	$2\frac{1}{4} + 3\frac{3}{8}$	$2 \div \frac{1}{4}$		25/455	
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The Grade 5 measure is 2 pages.

Students have 4 min on both pages.

T₁E_R

				TIER: 0	irade 6, Form
				Correct	Incorrect
ie			Date	- [
ite the answer for eac n't skip around. Simp	h problem. If you don't kno lify fractions to their most o	ow how to work the proble common form.	em, put an X over it and	move to the ne	xt problem.
60 ÷ 1	-88 + (-15) + (-22)	$\frac{15}{5} \div \frac{1}{5}$	1.23 × 2.04	429 >	240
$\frac{5}{4} \div \frac{8}{7}$	-342 ÷ 18	-15 × -9	$1\frac{1}{4} \times 1\frac{1}{2}$	-24 - (-8) – (-12)
-12 ÷ -3	125 × -31	-27 + 12 + (-7)	$\frac{1}{6} \times \frac{4}{6}$	3.7]9	1.76

The Grade 6 measure is 2 pages.

Students have 4 min on both pages.

T₁E_R



The Grade 6 measure is 2 pages.



Progress Monitoring Measures

Kindergarten	Quantity & Number Sequence	1 min (each side)	
Grade 1	Quantity Comparison & Addition and Subtraction	1 min (each side)	
Grade 2	Computation	Total of 2 min	
Grade 3	Computation	Total of 2 min	
Grade 4	Computation	Total of 4 min	
Grade 5	Computation	Total of 4 min	
Grade 6	Computation	Total of 4 min	

Administration

The Administration and Scoring Instructions have all the information you need to use the measures.

The page highlights the timing of each measure.

TIER Computational Fluency Progress-Monitoring System for K-6 Mathematics: Administration and Scoring Instructions

Overview of the Assessment System

The purpose of the TIER Computational Fluency Progress-Monitoring Assessment System is to measure students' computational fluency in kindergarten through grade 6 over time. These data can help educators determine the rate of students' growth in grade-level content standards and make inferences about the effectiveness of instruction in supporting student learning. This system is based on a well-known approach called curriculum-based measurement (CBM). CBMs are timed tests that represent an important indicator of general proficiency in the domain. For mathematics, that indicator is often considered to be computational fluency. Although computational fluency is only one strand of mathematical proficiency, it has been found to be predictive of students' overall mathematics performance in kindergarten through grade 6.

Computational fluency is defined as efficient and accurate methods for computing and is based on the standards specified in the Texas Essential Knowledge and Skills (TEKS). At each grade, the TEKS that comprise aspects of computational fluency were identified through a systematic review process.

The TIER Computational Fluency Progress-Monitoring Assessment System includes 20 forms in each grade, kindergarten to grade 6. Each form includes 30–40 items assessing the computational fluency TEKS. The representation of the TEKS on each form was based on proportional weighting and an analysis of their relative importance at the grade level and was approved by the Texas Education Agency.

Prototypical items for the TIER Computational Fluency Progress-Monitoring Assessment System were written by experienced Texas educators and were reviewed by mathematics education experts and approved by the Texas Education Agency. The prototypical items served as the template for all subsequent items on each grade-level form. For example, if Item 1 on Form 1 of Grade 5 assesses fraction addition, then Item 1 on all subsequent forms in Grade 5 also assesses fraction.

Overview of Administration and Scoring

The TIER Computational Fluency Progress-Monitoring Assessment System can be administered in the whole group, in small groups, or individually. Students have a fixed amount of time to respond to as many items as possible. They write their responses directly on the forms.

After administration, students' responses are scored using the answer key. The number of items the student responds to correctly within the allotted time is plotted on the graph.

Timing

The following table indicates how much time students have to respond to as many items as possible by grade. It is important to precisely and consistently follow the administration timing to allow for valid interpretations of student progress. Administration is standardized so that students always have the same amount of time.

Grade	Time		
К	1 minute each side		
1	1 minute each side		
2	A total of 2 minutes		
3	A total of 2 minutes		
4	A total of 4 minutes		
5	A total of 4 minutes		
6	A total of 4 minutes		

Administration

This page reviews the administration procedures.

This page also shows the directions for administration of Kindergarten and Grade 1 measures.

Preparation for Administration

To prepare for administration, the assessor will need to gather the following items:

- Enough copies of the form for each student
- Pencils for each student
- Stopwatch or timer

Administration Procedures

Follow these procedures to administer the tests.

- Make sure that students have the TIER Computational Fluency Progress-Monitoring Form and that it is double sided. If it isn't double sided, you may need to reprint the forms so you have all of the items. Make sure that the students put their name and the date on the top of the form.
- Read the standardized instructions aloud using the script provided. The script changes for some of the grades, so please read the script for the correct grade.
- 3. Say "Start" and start your stopwatch or timer. Monitor students to verify that they are working throughout the duration of the testing time. If you notice that someone is skipping a lot of items, you may suggest that students try to work on each problem. Avoid answering questions or providing feedback about the items or responses. It is important to remember that this is a test and that the results will be used to evaluate student progress.
- 4. At the end of the allotted time, say "Stop. Put your pencils down." Make sure that students stop working.

Kindergarten and Grade 1 Introduction

SIDE 1

"We will take two 1-minute math tests. I will tell you when to start and when to finish each test.

When I say 'start,' you may get started. Try to work each problem. If you really don't know how to do a problem, you can put an 'X' through it and go on to the next one.

Start with the first problem and then work across the page. Then work on the problems on the next row.

It is OK if you don't finish all of the items on the front of the page. Do not start working on the other side if you finish early.

We are ready to take the first test. You will have 1 minute to answer as many problems as you can. Remember not to rush. Do you have any questions?"

SIDE 2

"We are ready to take the second test. You will have 1 minute to answer as many problems as you can. Remember not to rush. Do you have any questions?"

Administration

This page features the administration of the measures in Grades 2 through 6.

This page also discusses scoring.

Grade 2 Introduction

"We will take a math test. You will have 2 minutes to answer as many problems as you can. I will tell you when to start. When I say 'stop,' you will put your pencils down.

When I say 'start,' you may get started with the first problem and then work across the page. Then work on the problems on the next row.

You will solve different math problems. Some problems will have a row of numbers with a blank. You will fill in the blank with the missing number.

Try to work each problem. If you really don't know how to do a problem, you can put an 'X' through it and go on to the next one.

If you finish the problems on the first side, start working on the other side. Do you have any questions?"

Grade 3 Introduction

"We will take a math test. You will have 2 minutes to answer as many problems as you can. I will tell you when to start. When I say 'stop,' you will put your pencils down.

When I say 'start,' you may get started with the first problem and then work across the page. Then work on the problems on the next row.

Try to work each problem. If you really don't know how to do a problem, you can put an 'X' through it and go on to the next one.

If you finish the problems on the first side, start working on the other side.

Do you have any questions?"

Grades 4–6 Introduction

"We will take a math test. You will have 4 minutes to answer as many problems as you can. I will tell you when to start. When I say 'stop,' you will put your pencils down.

When I say 'start,' you may get started with the first problem and then work across the page. Then work on the problems on the next row.

Try to work each problem. If you really don't know how to do a problem, you can put an ' χ ' through it and go on to the next one.

If you finish the problems on the first side, start working on the other side.

Do you have any questions?"

Scoring

Score each item that was attempted. Items are scored correct (1 point) or incorrect (0 points). Items that were not attempted do not get scored.

Each form has a unique answer key. For each item, compare the student's response to the answers provided on the corresponding answer key.

Count the number of items scored correct and record this on the form. This value will also be added to the graphing spreadsheet.

Materials

All materials (both student and teacher) are also available in Spanish.

Sistema TIER para monitorear el progreso de fluidez computacional en matemáticas para grados K-6: Instrucciones para estudiantes

Kindergarten _____

Comparación de cantidades

Examina los números y circula el mayor o más grande.

Secuencia numérica Completa el espacio en blanco con el número que falta.

Grado 1 _____

Comparación de cantidades

Examina los números y circula el mayor o más grande.

Sumas y restas

Escribe la respuesta para cada problema. Si no sabes cómo resolver un problema, pon una X encima y continua con el siguiente problema.

Grado 2 _

Escribe la respuesta para cada problema. Algunos problemas te darán una lista de números con un espacio en blanco. Completa el espacio en blanco con el número que falta. Si no sabes cómo resolver el problema, pon una X encima y continua con el siguiente problema.

Grado 3 ___

Escribe la respuesta para cada problema. Si no sabes cómo resolver el problema, pon una X encima y continua con el siguiente problema.

Grado 4–6 _

Escribe la respuesta para cada problema. Si no sabes cómo resolver el problema, pon una X encima y continua con el siguiente problema. Completa los problemas en orden. Simplifica las fracciones a su forma más común.

Let's Practice



Practice

				TIER: Grade 5, For	m 2				
				Correct Incorrec	t				
Name			Date	-					
Write the answer for eac Don't skip around. Simpli	h problem. If you don't kn ify fractions to their most	ow how to work the prob common form.	lem, put an X over it and r	move to the next probler	n.				
300 <u>× 40</u>	$\frac{11}{24} + \frac{5}{6}$	16 768	$\frac{1}{3} \div 70$	495 × 80					TIER: Grade 5, Form 2 Correct Incorrect
					Don't skip around. Simpl	fy fractions to their most	common form.	em, put an X over it and m	love to the next problem.
					150 × 52	1.49 × 7.6	622 × 55	$\frac{31}{3} - \frac{2}{3}$	$\frac{1}{15}$ +42
13/52	5 <mark>8</mark> -5 <u>3</u>	24]1,776	$\frac{3}{5} + \frac{1}{8}$	63.56 <u>+ 28.32</u>					15
					12/516	12 × 1.6	$24\frac{5}{6} - 15\frac{3}{5}$	0.14 × 1.7	$\frac{7}{6} + \frac{4}{6}$
× 481 × 27	$\frac{11}{20} - \frac{5}{40}$	4.593 <u>- 3.286</u>	52]1,365	25 ÷ <u>1</u> 17			0 5		
©2021 TI	he University of Texas System/T	exas Education Agency. Licen:	sed under CC-BY-ND-NC 4.0 Int	ernational.	25 85	$2\frac{4}{6} + 2\frac{3}{12}$	$5 \div \frac{1}{5}$	22]3,806	35/854
					©2021 TI	ne University of Texas System/I	exas Education Agency. License	ed under CC-BY-ND-NC 4.0 Inte	rnational. 2

Scoring Practice

TIER: Grade 5, Form 2 *Note: KEY Not all possible answer choices are represented in this key. Write the answer for each problem. If you don't know how to work the problem, put an X over it and move to the next problem. Don't skip around. Simplify fractions to their most common form.					
300 × 40	$\frac{11}{24} + \frac{5}{6}$	16\768	$\frac{1}{3}$ ÷70	495 × 80	
12,000	$\frac{31}{24} \text{ or } 1\frac{7}{24}$	48	1 210	39,600	
13/52	$5\frac{5}{8} - 5\frac{3}{16}$	24)1,776	$\frac{3}{5} + \frac{1}{8}$	63.56 + 28.32	
4	7 16	74	29 40	91.88	
481 × 27	$\frac{11}{20} - \frac{5}{40}$	4.593 - 3.286	52)1,365	25 ÷ <u>1</u> 17	
12,987	<u>17</u> 40	1.307	26.25	425	

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Scoring Practice

TIER: Grade 5, Form 2 *Note: KEY Not all possible answer choices are represented in this key. Write the answer for each problem. If you don't know how to work the problem, put an X over it and move to the next problem. Don't skip around. Simplify fractions to their most common form						
150 <u>× 52</u>	1.49 <u>× 7.6</u>	622 × 55	$\frac{31}{3} - \frac{2}{3}$	<u>1</u> 15 ÷42		
7,800	11.324	34,210	$\frac{29}{3} \text{ or } 9\frac{2}{3}$	<u>1</u> 630		
12/516	12 <u>× 1.6</u>	$24\frac{5}{6} - 15\frac{3}{5}$	0.14 <u>× 1.7</u>	$\frac{7}{6} + \frac{4}{6}$		
43	19.2	9 <u>7</u> 30	0.238	$\frac{11}{6} \text{ or } 1\frac{5}{6}$		
25)85	$2\frac{4}{6} + 2\frac{3}{12}$	$5 \div \frac{1}{5}$	22]3,806	35 854		
3.4	4 <u>11</u> 12	25	173	24.4		

T₁E_R

Recommendations



Grade Level and Administration Timing

Kindergarten	Quantity & Number Sequence	1 min (each side)	
Grade 1	Quantity Comparison & Addition and Subtraction	1 min (each side)	
Grade 2	Computation	Total of 2 min	
Grade 3	Computation	Total of 2 min	
Grade 4	Computation	Total of 4 min	
Grade 5	Computation	Total of 4 min	
Grade 6	Computation	Total of 4 min	

Recommendations

At Tier 2, every 1-2 weeks

At Tier 3, once a week (at least) Use a graphing system for easy access to data.

A graphing system also helps with timely decision making. Analyze student work (i.e., an error analysis) to inform directions for instruction.








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To obtain a license to use the materials in a manner not specified above, contact **licensing@meadowscenter.org** Which math progress monitoring measures might you use? How would you use them?



Math Progress Monitoring Measures

Goal Setting

Decision Making





What is your experience with this model of databased decision making?



What is Progress Monitoring?

Tests/measures/probes administered **frequently** Compare scores to understand **mathematics growth**

Must be **reliable** and **valid**

Must have alternate forms



Where to Find Progress Monitoring Measures?

National Center on Intensive Intervention



www.intensiveintervention.org





Progress Monitoring Suggestions

Name	Grade
Early Numeracy Measure Number Identification; Quantity Discrimination; Missing Number	К
Computation	1-2
Concepts and Applications	3-8



Progress Monitoring Considerations

- Skills to be measured—age and grade appropriate
- Cost and training requirements
- Administration and scoring time
- Data management
- Technical rigor (consider population)
 - Reliability
 - Validity
 - Evidence of being sensitive to change
 - Alternate/parallel forms



Number Identification

6	16	23	10	17
38	97	20	15	24
14	33	11	79	8
21	19	93	3	49
4	30	12	9	1
28	7	27	2	13
Acadience®Math © 2019 Acadience Learning Ir	ю.		Progress Monitoring 1 /	Number Identification Sheet 1 Page 2



Quantity Discrimination









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Progress Monitoring 11 / Missing Number Fluency Sheet 1 Page 32



Acadience[®] Math / Computation Grade 4 Benchmark 1 / Form A

\sim	
Com	putation

				Total:
1. 527 <u>+320</u>	2. 4778 <u>+2242</u>	3. $8\frac{4}{5} - 6\frac{2}{5} =$	4. 9 <u>x8</u>	5. 4 573
6. 197 <u>- 74</u>	7. $\frac{5}{8} + \frac{2}{8} =$	8. 7273 <u>- 387</u>	9. 19 <u>x11</u>	10. 9 $\frac{7}{12}$ - 1 $\frac{4}{12}$ =
11. 8 642	12. 7 49	13. 99 <u>x72</u>	14. $\frac{1}{4} + \frac{2}{4} =$	15. 526 <u>x 6</u>
$8\frac{9}{10} - 1\frac{5}{10} =$	17. $\frac{1}{3} + \frac{1}{3} =$	$\frac{9}{12} - \frac{2}{12} =$	19. 829 <u>x 7</u>	20. 6 939
21. 3 397	22. 65 <u>x23</u>	23. 2414 <u>- 668</u>	24. 7568 <u>+1638</u>	25. 34 <u>x12</u>



	Grade	Concepts and Applica 4 / Benchmark 1	itions
			Total:
 Is the dotted line a line symmetry for each shu Write "yes" or "no" in the space provided below shape. 	e of ape? ne each		, , , , , , , , , , , , , , , , , , ,
2. Compare the number Box 1 > 835 333 131 3. List three numbers the	in Box 1 with the number in Box 2. Final Stress of the second stress of	II in the blank with > (greater th	an), = (equal to), or < (less than):
		-	
4. Jake read 17 books on How many more book	ver the summer that were nonfiction as did Jake read than Ross?	- and 43 books that were fiction. books.	His friend Ross read 38 books total.
4. Jake read 17 books or How many more book	in Box 1 with the decimal in Box 2. F	- and 43 books that were fiction. books. ill in the blank with > (greater th	His friend Ross read 38 books total. an), = (equal to), or < (less than):
4. Jake read 17 books or How many more book 5. Compare the decimal	in Box 1 with the decimal in Box 2. F	- and 43 books that were fiction. books. ill in the blank with > (greater th	His friend Ross read 38 books total. an), = (equal to), or < (less than):
4. Jake read 17 books or How many more book 5. Compare the decimal Box 1 > 0.47 0.39	wer the summer that were nonfiction as did Jake read than Ross? in Box 1 with the decimal in Box 2. F r, =, < Box 2 0.25 0.68	- and 43 books that were fiction. books. ill in the blank with > (greater th	His friend Ross read 38 books total. an), = (equal to), or < (less than):

Concepts and Applications



	Next Number / Counting	Grades K-1
Beyond	Geometry / Measurement	Grades 1-6
these measures…	Proportional Reasoning / Quantity Discrimination / Number Properties	Middle School
	Algebra	High School



Progress Monitoring Suggestions

Name	Grade
Early Numeracy Measure Number Identification; Quantity Discrimination; Missing Number	K
Computation	1-2
Concepts and Applications	3-8
Which measure(s) do you plan to use?	



Goal Setting and Decision Making





Graphing





Setting Goals





 Identify appropriate grade-level benchmark
 Mark benchmark on student graph with an X
 Draw goal-line from baseline progress monitoring scores to X



1. Identify appropriate grade-level benchmark

Grade	Computation	Concepts and Applications
1	20 digits	20 points
2	20 digits	20 points
3	30 digits	30 points
4	40 digits	30 points
5	30 digits	15 points
6	35 digits	15 points



1. Identify appropriate grade-level benchmark

Grade	Computation	Concepts and Applications
1	20 digits	20 points
2	20 digits	20 points
3	30 digits	30 points
4	40 digits	30 points
5	30 digits	15 points
6	35 digits	15 points

Maria: 2^{nd_} grade student using Computation



 Identify appropriate grade-level benchmark
 Mark benchmark on student graph with an X
 Draw goal-line from baseline progress monitoring scores to X





Setting Goals

Benchmark

Slope (ROI)



- 1. Locate slope (i.e., rate of improvement ROI)
- 2. Multiply ROI by number of weeks left in intervention
- 3. Add to baseline of progress monitoring scores
- 4. Mark goal on student graph with an X
- 5. Draw goal-line from baseline progress monitoring scores to X



1. Locate slope (i.e., rate of improvement – ROI)

Grade	Computation—Slope for Digits Correct	Concepts and Applications — Slope for Points
1	0.35	No data available
2	0.30	0.40
3	0.30	0.60
4	0.70	0.70
5	0.70	0.70
6	0.40	0.70



1. Locate slope (i.e., rate of improvement – ROI)

Grade	Computation—Slope for Digits Correct	Concepts and Applications — Slope for Points
1	0.35	No data available
2	0.30	0.40
3	0.30	0.60
4	0.70	0.70
5	0.70	0.70
6	0.40	0.70

Maria: 2ndgrade student using Computation





1. Locate slope (i.e., rate of improvement – ROI) 0.30



- 1. Locate slope (i.e., rate of improvement ROI) 0.30
- 2. Multiply ROI by number of weeks left in intervention $0.30 \times$









- Locate slope (i.e., rate of improvement ROI) 0.30 1.
- Multiply ROI by number of weeks left in intervention $0.30 \times 10 = 3$ 2.



- 1. Locate slope (i.e., rate of improvement ROI)
- 2. Multiply ROI by number of weeks left in intervention $0.30 \times 10 = 3$
- 3. Add to baseline of progress monitoring scores

0.30 0.30 × 10 = 3 3 +







- 1. Locate slope (i.e., rate of improvement ROI)
- 2. Multiply ROI by number of weeks left in intervention $0.30 \times 10 = 3$
- 3. Add to baseline of progress monitoring scores

0.30 $0.30 \times 10 = 3$ 3 + 6.7 = 9.7



- 1. Locate slope (i.e., rate of improvement ROI)
- 2. Multiply ROI by number of weeks left in intervention $0.30 \times 10 = 3$
- 3. Add to baseline of progress monitoring scores
- $0.30 \times 10 = 3$ 3 + 6.7 = 9.7

0.30

- 4. Mark goal on student graph with an X
- 5. Draw goal-line from baseline progress monitoring scores to X



Setting Goals





Intraindividual

- 1. Identify student's slope
- 2. Multiply slope by 1.5
- 3. Multiply by number of weeks until end of intervention
- 4. Add to student's baseline score
- 5. Mark goal on student graph with an X
- 6. Draw goal-line from baseline progress monitoring scores to X


1. Identify student's slope

SLOPE CALCULATION: <u>3rd median – 1st median</u> #data points – 1



SLOPE CALCULATION: <u>3rd median – 1st median</u> #data points – 1





1. Identify student's slope

0.4



1. Identify student's slope
2. Multiply slope by 1.5

0.4 $0.4 \times 1.5 = 0.6$



- 1. Identify student's slope
- 2. Multiply slope by 1.5
- 3. Multiply by number of weeks until end of intervention 0.6
- 0.4 0.4 × 1.5 = 0.6 0.6 ×







- 1. Identify student's slope
- 2. Multiply slope by 1.5
- 3. Multiply by number of weeks until end of intervention $0.6 \times 10 = 6$

0.4 0.4 × 1.5 = 0.6 0.6 × 10 = 6



- 1. Identify student's slope
- 2. Multiply slope by 1.5
- 3. Multiply by number of weeks until end of intervention
- 4. Add to student's baseline score

0.4 0.4 × 1.5 = 0.6 0.6 × 10 = 6 6







- 1. Identify student's slope
- 2. Multiply slope by 1.5
- 3. Multiply by number of weeks until end of intervention
- 4. Add to student's baseline score

0.4 $0.4 \times 1.5 = 0.6$ $0.6 \times 10 = 6$ 6 + 6.7 = 12.7



- 1. Identify student's slope
- 2. Multiply slope by 1.5
- 3. Multiply by number of weeks until end of intervention
- 4. Add to student's baseline score
- 5. Mark goal on student graph with an X
- 6. Draw goal-line from baseline progress monitoring scores to X



0.4

 $0.4 \times 1.5 = 0.6$

 $0.6 \times 10 = 6$

6 + 6.7 = 12.7



Benchmark Slope (ROI) Intraindividual







Math Progress Monitoring Measures

Goal Setting

Decision Making











If at least 6 weeks of instruction have occurred:

• If all four most recent scores fall above the goal-line, increase the goal.











If at least 6 weeks of instruction have occurred:

- If all four most recent scores fall above the goal-line, increase the goal.
- If all four most recent scores fall **below** the goal-line, adapt the intervention.









Four most recent, consecutive scores

If at least 6 weeks of instruction have occurred:

- If all four most recent scores fall above the goal-line, increase the goal.
- If all four most recent scores fall **below** the goal-line, adapt the intervention.
- If the four most recent scores fall both **above and below** the goal-line, continue monitoring data.

















 If the trend-line is steeper than the goal line, then increase the goal.











- If the trend-line is steeper than the goal line, then increase the goal.
- If the trend-line is **flatter** than the goal line, then adapt the intervention.







XA+H



- If the trend-line is steeper than the goal line, then increase the goal.
- If the trend-line is flatter than the goal line, then adapt the intervention.
- If the trend-line and goal-line are **fairly equal**, continue monitoring progress.







XA+H

Which determining response method might you try first? Why?



Math Progress Monitoring Measures

Goal Setting

Decision Making



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