INTERVENTION CENTRAL

RTI Toolkit: A Practical Guide for Schools

RTI: Using Curriculum-Based Measurement to Monitor Student Progress in Basic Academic Skills

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CBM Reading Assessment

RTI-Ready Methods to Monitor Student Academics

Reading: Phonemic Awareness / Alphabetics

☐ Initial Sound Fluency	⏳: 3 minutes	Administration: 1:1
Description: The student is shown 4 pictures, each depicting an object that begins with a different letter sound. The examiner gives the student a letter sound and asks the student to select the picture of the object that begins with that letter sound. The process is repeated with new sets of pictures until the time		
Where to get materials: DIBELS https://dibels.uoregon.edu/		

☐ Phoneme Segmentation Fluency	⏳ 1 minute	Administration: 1:1
Description: The student is read a list of words that contain from 2 to five phonemes. For each word, the student is asked to recite all of the phonemes that make up the word.		
Where to get materials: DIBELS https://dibels.uoregon.edu/		

☐ Nonsense Word Fluency	⏳ 1 minute	Administration: 1:1
Description: The student is shown a list of nonsense words of 2 to 3 letters in length. For each word, the student is to read the word or give the sounds that make up the word.		
Where to get materials: DIBELS https://dibels.uoregon.edu/		

☐ Letter Naming Fluency	⏳ 1 minute	Administration: 1:1
Description: The student is presented with a list of randomly arranged letters. The student names as many letters as possible.		
Where to get materials: DIBELS https://dibels.uoregon.edu/		

☐ Letter Sound Fluency	⏳ 1 minute	Administration: 1:1
Description: The student is presented with a list of randomly arranged letters. The student gives the sounds of as many letters as possible.		
Where to get materials: www.interventioncentral.org		

☐ Word Identification Fluency	⏳ 1 minute	Administration: 1:1
Description: The student is presented with a list of words randomly selected from a larger word list (e.g., Dolch Wordlist). The student reads as many words as possible.		
Where to get materials: • Easy CBM http://www.easycbm.com • Intervention Central http://www.interventioncentral.org (Dolch wordlists)		

Reading: Fluency

□ Oral Reading Fluency	⏳: 1 minute	Administration: 1:1
Description: The student reads aloud from a passage and is scored for fluency and accuracy. Passages are controlled for level of reading difficulty.		
Where to get materials: • DIBELS https://dibels.uoregon.edu/ • AimsWeb http://www.aimsweb.com/ • Easy CBM http://www.easycbm.com • Intervention Central http://www.interventioncentral.org (Use the OKAPI page to create customized ORF passages)		

Reading: Basic Comprehension

□ Maze Passages	⏳: 1-3 minutes	Administration: Group
Description: The student is given a passage in which every 7th word has been removed. The student reads the passage silently. Each time the student comes to a removed word, the student chooses from among 3 replacement words: the correct word and two distractors. The student circles the replacement word that he or she believes best restores the meaning of the text.		
Where to get materials: • AimsWeb http://www.aimsweb.com/ • Intervention Central http://www.interventioncentral.org (Use the Maze Passage Generator page to create customized Maze passages)		

□ Multiple-Choice Reading Comprehension	⏳: Unknown	Administration: Group
Description: The student is given a passage to read. The student then answers a series of standardized comprehension questions based on the text.		
Where to get materials: • Easy CBM http://www.easycbm.com		

References

Hosp, M.K., Hosp, J. L., & Howell, K. W. (2007). T*he ABCs of CBM.* New York: Guilford

Howell, K. W. (2008). Best practices in curriculum-based evaluation and advanced reading. In A. Thomas & J. Grimes (Eds.), Best practices in school psychology V (pp. 397-418). Bethesda, MD: National Association of School Psychologists.

Evaluate the 'RTI Readiness' of Your School's Academic Measures

Directions. Use the questionnaire below to evaluate the 'RTI readiness'' of any academic measure. Note that questions on the form are hierarchically organized: If items earlier in the survey are endorsed 'no', the measure probably cannot be used for more advanced applications that appear later in the survey. Use the table *Interpreting the Results of This Survey* below to identify the appropriate uses for your measure in the RTI problem-solving process..

Name of Measure: _____

Item #	Rating Item	YES	NO	
	Background: Validity.			Background
1.	*Content Validity*. Does the measure provide meaningful information about the academic skill of interest?	☐ Y	☐ N	
2.	*Convergent Validity*. Does the measure yield results that are generally consistent with other well-regarded tests designed to measure the same academic skill?	☐ Y	☐ N	
3.	*Predictive Validity*. Does the measure predict student success on an important future test, task, or other outcome?	☐ Y	☐ N	
	Baseline: Reliability.			Baseline
4.	*Test-Retest/Alternate-Form Reliability*. Does the measure have more than one version or form? If two alternate, functionally equivalent versions of the measure are administered to the student, does the student perform about the same on both?	☐ Y	☐ N	
5.	*Interrater Reliability*. When two different evaluators observe the same student's performance and independently use the measure to rate that performance, do they come up with similar ratings?	☐ Y	☐ N	
	Benchmarks & Goal-Setting			Goal-Setting
6.	*Performance Benchmarks*. Does the measure include benchmarks or other performance criteria that indicate typical or expected student performance in the academic skill?	☐ Y	☐ N	
7.	*Goal-Setting*. Does the measure include guidelines for setting specific goals for improvement?	☐ Y	☐ N	
	Progress-Monitoring and Instructional Impact			Progress-Monitoring
8.	*Repeated Assessments*. Does the measure have sufficient alternative forms to assess the student weekly for at least 20 weeks?	☐ Y	☐ N	
9.	*Equivalent Alternate Forms.* Are the measure's repeated assessments (alternative forms) equivalent in content and level of difficulty?	☐ Y	☐ N	
10.	*Sensitive to Short-Term Student Gains*. Is the measure sensitive to short-term improvements in student academic performance?	☐ Y	☐ N	
11.	*Positive Impact on Learning*. Does research show that the measure gives teachers information that helps them to make instructional decisions that positively impact student learning?	☐ Y	☐ N	

Interpreting the Results of This Survey of Your Academic Measure:

- YES to Items 1-3. Background. The measure gives valid *general* information about the student's academic skills and performance. While not sufficient, the data can be interpreted as part of a larger collection of student data.
- YES to Items 4-5. Baseline. The measure gives reliable results when given by different people and at different times of the day or week. Therefore, the measure can be used to collect a current 'snapshot' of the student's academic skills prior to starting an intervention.
- YES to Items 6-7. Goal-Setting. The measure includes standards (e.g., benchmarks or performance criteria) for 'typical' student performance (e.g., at a given grade level) and guidelines for estimating rates of student progress. Schools can use the measure to assess the gap in performance between a student and grade level peers—and also to estimate expected rates of student progress during an intervention.
- YES to Items 8-11. Progress Monitoring. The measure has the appropriate qualities to be used to track student progress in response to an intervention.

Comparing Reading Measures for 'RTI Readiness'

School: _____ Date: _____ Person(s) Completing Ratings: _____

☐ Phonemic Awareness/Alphabetics ☐ Fluency With Text ☐ Vocabulary ☐ Comprehension

Directions: Use this form to compare reading measures in your school for qualities of 'RTI readiness'. Put an 'X' in a column if the measure has that measurement quality. (Consult the form *Evaluate the 'RTI Readiness' of Your School's Academic Measures* for a more detailed description of each measurement quality.)

	Background: Validity			Baseline: Reliability		Goal-Setting		Progress-Monitoring			
	Content Validity.	*Convergent Validity*	*Predictive Validity*	*Test-Retest/ Alternate Form Reliability*	*Interrater Reliability*	*Performance Benchmarks*	*Goal-Setting*	*Repeated Assessments*	*Equivalent Alternate Forms*	*Sensitive to Short-Term Student Gains*	*Positive Impact on Learning*
Name of Measure	1	2	3	4	5	6	7	8	9	10	11

Administration of CBM reading probes

The examiner and the student sit across the table from each other. The examiner hands the student the unnumbered copy of the CBM reading passage. The examiner takes the numbered copy of the passage, shielding it from the student's view.

The examiner says to the student:

> *When I say, 'start,' begin reading aloud at the top of this page. Read across the page* [demonstrate by pointing]. *Try to read each word. If you come to a word you don't know, I'll tell it to you. Be sure to do your best reading. Are there any questions?*
>
> [Pause] *Start.*

The examiner begins the stopwatch when the student says the first word. If the student does not say the initial word within 3 seconds, the examiner says the word and starts the stopwatch. As the student reads along in the text, the examiner records any errors by marking a slash (/) through the incorrectly read word. If the student hesitates for 3 seconds on any word, the examiner says the word and marks it as an error. At the end of 1 minute, the examiner says, *Stop* and marks the student's concluding place in the text with a bracket ( ]).

Scoring

Reading fluency is calculated by first determining the total words attempted within the timed reading probe and then deducting from that total the number of incorrectly read words.

The following scoring rules will aid the instructor in marking the reading probe:

- Words read correctly are scored as correct:
  - --Self-corrected words are counted as correct.
  - --Repetitions are counted as correct.
  - --Examples of dialectical speech are counted as correct.
  - --Inserted words are ignored.

- Mispronunciations are counted as errors.

Example
Text: The small gray fox ran to the cover of the trees.
Student: "The smill gray fox ran to the cover of the trees."

- Substitutions are counted as errors.

Example
Text: When she returned to the house, Grandmother called for Franchesca.
Student: "When she returned to the home, Grandmother called for Franchesca.

➔ Omissions are counted as errors.

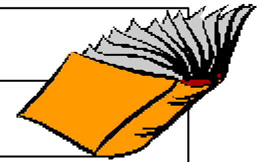
Example
Text: Anna could not compete in the last race.
Student: "Anna could not in the last race."

➔ Transpositions of word-pairs are counted as 1 error.

Example
Text: She looked at the bright, shining face of the sun.
Student: "She looked at the shining bright face of the sun."

➔ Words read to the student by the examiner after 3 seconds have gone by are counted as errors.

Student Record Form: Curriculum-Based Measurement: Oral Reading Fluency



Student Name: ____________________________ Grade/Classroom: ____________________

Reading Skill Level: _________________________ Best Time(s) for CBM Monitoring: ____________

Step 1: Conduct a Survey-Level Assessment: Use this section to record the student's reading rates in progressively more difficult material.

Date:_______ Book/Reading Level: ____________

	TRW	E	CRW	%CRW
A.	______	______	______	______
B.	______	______	______	______
C.	______	______	______	______

Date:_______ Book/Reading Level: ____________

	TRW	E	CRW	%CRW
A.	______	______	______	______
B.	______	______	______	______
C.	______	______	______	______

Date:_______ Book/Reading Level: ____________

	TRW	E	CRW	%CRW
A.	______	______	______	______
B.	______	______	______	______
C.	______	______	______	______

Date:_______ Book/Reading Level: ____________

	TRW	E	CRW	%CRW
A.	______	______	______	______
B.	______	______	______	______
C.	______	______	______	______

Date:_______ Book/Reading Level: ____________

	TRW	E	CRW	%CRW
A.	______	______	______	______
B.	______	______	______	______
C.	______	______	______	______

Date:_______ Book/Reading Level: ____________

	TRW	E	CRW	%CRW
A.	______	______	______	______
B.	______	______	______	______
C.	______	______	______	______

Date:_______ Book/Reading Level: ____________

	TRW	E	CRW	%CRW
A.	______	______	______	______
B.	______	______	______	______
C.	______	______	______	______

Table 1: Sample Estimates of 'Typical' CBM Instructional Reading Levels By Grade

	Shapiro (1996)		Milwaukee Public Schools (Winter 2000-2001 Local Norms)
Grade	CRW Per Min	Reading Errors	CRW Per Min for Students in 25th-75th Percentile
1…….	40-60	Fewer than 5	22-64
2…….	40-60	Fewer than 5	36-78
3…….	70-100	Fewer than 7	47-88
4…….	70-100	Fewer than 7	60-104
5…….	70-100	Fewer than 7	77-121
6…….	70-100	Fewer than 7	95-146

Step 2: Compute a Student Reading Goal

1. At what grade or book level will the student be monitored? (Refer to results of Step 1:*Survey-Level Assessment*)

   ____

2. What is the student's *baseline* reading rate (# correctly read words per min)? ________CRW Per Min
3. When is the *start date* to begin monitoring the student in reading? _____ / _____ / _____
4. When is the *end date* to stop monitoring the student in reading? _____ / _____ / _____
5. How many instructional weeks are there between the start and end dates? (Round to the nearest week if necessary):

   _______ Instructional Weeks

6. What do you *predict* will be the student's average increase in correctly read words per minute will be for each instructional week of the monitoring period? (See Table 2):

   _________ Weekly Increase in CRW Per Min

7. What will the student's predicted CRW *gain* in reading fluency be at the end of monitoring? (Multiply Item 5 by Item 6): _____________
8. What will the student's predicted *reading rate* be at the end of the monitoring period? (Add Items 2 & 7): ______ CRW Per Min

References

Fuchs, L.S., Fuchs, D., Hamlett, C.L., Walz, L., & Germann, G. (1993). Formative evaluation of academic progress: How much growth can we expect? *School Psychology Review*, 22, 27-48.

Shapiro, E.S. (1996). *Academic skills problems: Direct assessment and intervention*. New York: Guilford Press.

Student Name: _____ Grade/Classroom: _____

Step 2: Collect Baseline Data: Give 3 CBM reading assessments within a one-week period using monitoring-level probes.

Baseline 1

Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

Baseline 2

Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

Baseline 3

Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

Step 3: Complete CBM Progress-Monitoring Weekly or More Frequently: Record the results of regular monitoring of the student's progress in reading fluency.

1. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

2. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

3. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

4. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

6. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

7. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

8. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

9. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

10. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

11. Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

Date:_____ Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	_____	_____	_____	_____
B.	_____	_____	_____	_____
C.	_____	_____	_____	_____

Table 2: Predictions for Rates of Reading Growth by Grade
(Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993)
Increase in Correctly Read Words Per Minute for Each Instructional Week

Grade Level	*Realistic Weekly Goal*	*Ambitious Weekly Goal*
Grade 1	2.0	3.0
Grade 2	1.5	2.0
Grade 3	1.0	1.5
Grade 4	0.85	1.1
Grade 5	0.5	0.8
Grade 6	0.3	0.65

One hundred years ago in Paris, when theaters and music halls 11
drew traveling players from all over the world, the best place to 23
stay was at the widow Gateau's, a boardinghouse on English 33
Street. Acrobats, jugglers, actors, and mimes from as far away 43
as Moscow and New York reclined on the widow's feather 53
mattresses and devoured her kidney stews. Madame Gateau 61
worked hard to make her guests comfortable, and so did her 72
daughter, Mirette. The girl was an expert at washing linens, 82
chopping leeks, paring potatoes, and mopping floors. She was 91
a good listener too. Nothing pleased her more than to overhear 102
the vagabond players tell of their adventures in this town and 113
that along the road. 117

Harcourt Brace Signatures Series 1999
Level 4-1 Rare Finds
Mirette on the High Wire pp. 87

One hundred years ago in Paris, when theaters and music halls drew traveling players from all over the world, the best place to stay was at the widow Gateau's, a boardinghouse on English Street. Acrobats, jugglers, actors, and mimes from as far away as Moscow and New York reclined on the widow's feather mattresses and devoured her kidney stews. Madame Gateau worked hard to make her guests comfortable, and so did her daughter, Mirette. The girl was an expert at washing linens, chopping leeks, paring potatoes, and mopping floors. She was a good listener too. Nothing pleased her more than to overhear the vagabond players tell of their adventures in this town and that along the road.

Harcourt Brace Signatures Series 1999
Level 4-1 Rare Finds
Mirette on the High Wire pp. 87

Someone is lost in the woods. He might be hurt, or the weather 13
could turn bad. It is important to find him as fast as possible. 26
But he didn't follow a trail, and footprints don't show on the 38
forest floor. What to do? Call in the search and rescue dogs. 50
Dogs have a very fine sense of smell. They can find people lost 63
by following their scents, because each person has his or her 74
own, unique scent. Panda is a Newfoundland dog trained to 84
locate lost people. She and her owner, Susie Foley, know how 95
to search through the woods, under the snow, or in the water. 107

Harcourt Brace Signatures Series 1999
Level 4-1 Rare Finds
Hugger to the Rescue pp. 143-144

In the busy rain forest of Malaysia, a grasshopper leaps into a 12
spray of orchids. Suddenly, one of the “flowers” turns on the 23
grasshopper. An orchid mantis, with wings like petals, grips it 33
tightly. For the grasshopper, there will be no escape. The 43
orchid mantis is a master of camouflage – the art of hiding while 55
in plain sight. Camouflage enables predators like the orchid 64
mantis to hide while they lie in wait for their prey. For other 77
animals, camouflage is a method of protection from their 86
enemies. Animals blend into the background in several ways. 95
Their colors and patterns may match their surroundings. 103

Harcourt Brace Signatures Series 1999
Level 4-1 Rare Finds
Hiding Out pp. 270

CBM Reading: Graphing Exercise for Jared M.: 4th-Grader

Background. Your Teacher Support Team has completed a CBM survey-level screening in reading for Jared M., a 4th grader. According to his teacher, Jared reads at the beginning 2nd-grade level. An initial TST meeting is held on Monday, January 20th. At that meeting, an intervention is designed in which Jared will be paired with an older student to be tutored in reading 3 times per week for 20-minute sessions (using the Listening-While-Reading strategy). The teacher also plans to meet with Jared's mother, who has agreed to preview reading vocabulary with Jared at home. Your team schedules a follow-up TST meeting for Monday, March 10th, about six instructional weeks from the date of the initial meeting.

CBM Practice Items. Attached is a CBM Student Record that contains Jared's CBM reading data. Complete the practice items below to gain experience in interpreting and charting CBM data.

1. ***Survey-Level Assessment.*** On Jared's attached CBM *Student Record Form*, review the Survey-Level assessment results. For each level of CBM probe administered, circle the median Correctly Read Words (CRWs), Errors (E), and Percentage of Correctly Read Words (%CRWs). Consult Table 1 on the Record Form to identify the student's Mastery, Instructional, and Frustration levels of reading.

2. ***Set up the graph.*** At the top of your monitoring graph, put in these date-spans for each of the instructional weeks during which Jared will be monitored:

Baseline: 1/13-1/17	Week 4: 2/10-2/14	Week 8: 3/17-3/21	Week 12: 4/14-4/18
Week 1: 1/20-1/24	Week 5: 2/24-2/28	Week 9: 3/24-3/28	
Week 2: 1/27-1/31	Week 6: 3/3-3/7	Week 10: 3/31-4/4	
Week 3: 2/3-2/7	Week 7: 3/10-3/14	Week 11: 4/7-4/11	

3. ***Determine & chart the student's baseline reading rate.*** On the Record Form, review Jared's Baseline assessment information.
   - Notice that the *'Book/Reading Level'* is not filled in for the Baseline observations. Find the *highest instructional reading level* that the student attained on the Survey-Level assessment. Since this would be the level at which you should monitor the student's progress, write that book level in the appropriate blank in the Baseline observations.
   - Circle the median CRW and E for each of the Baseline observations.
   - On the progress-monitoring graph, chart the median CRWs and Es for all 3 observations.
   - Of the Baseline values that you charted, disregard the highest and lowest CRWs. The middle CRW should be assumed to be the best estimate of the student's starting, or baseline, reading rate. *Circle this middle Baseline datapoint on your chart*.

4. ***Set a performance goal.*** To compute Jared's performance goal in reading:
   - Use Table 2 on the Record Form to identify the rate of progress that Jared should make each week in goal-level (3rd-Grade) reading material.
   - You will recall that your TST has decided to monitor Jared's reading for six weeks before holding a follow-up meeting. To compute how much Jared's reading rate should increase

in that time, multiply his *expected weekly progress* by the *number of weeks* that he will be monitored.

- Add Jared's expected reading progress to his baseline reading rate. This combined figure is Jared's *reading goal*.

5. **Plot the 'Aim-Line'.** To graph a 6-week 'aim-line':
   - Draw a vertical dividing line ('start-line') at the point where the intervention will begin (start of Week 1).
   - Draw a second dividing line on the graph ('end-line') that marks the conclusion of six weeks of monitoring (end of Week 6).
   - On the start-line, mark an 'X' at the point that is equal to the value of your circled baseline datapoint.
   - Mark Jared's reading goal with an 'X' at the appropriate spot on the end-line.
   - Now draw a straight line between the start-line and end-line 'X's. This is your chart's aim-line.

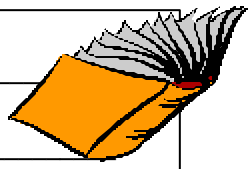
6. ***Plot Jared's progress-monitoring data.*** Review Jared's CBM data for the first six weeks of progress-monitoring. Circle the median CRWs and Es and plot them on the chart. What conclusions do you draw from the chart? Based on these data, should the Teacher Support Team recommend changing Jared's intervention? Keep it in place with no changes? Why?

7. ***Continue with progress monitoring.*** Assume that your TST met for the follow-up meeting and decided to keep the current intervention in place. In addition, they assign him for daily sessions with a Reading Specialist trained in Reading Recovery. The team plans to monitor for another 6 weeks—and assumes that Jared should make at least 2 words growth in reading fluency per week.
   - Compute a new baseline for Jared by looking at his most recent 3 CRW data points and circling the median value. Compute how much Jared's reading rate should increase after 6 additional weeks of intervention and add this amount to his new baseline reading rate. This is Jared's *revised reading goal*.
   - Set up a new 'aim-line':
     - Draw a vertical dividing line ('start-line') at the point where the revised intervention begins (start of week 7).
     - Draw a second dividing line on the graph ('end-line') that marks the conclusion of 6 more weeks of monitoring (end of Week 12).
     - On the new start-line, mark an 'X' at the point that is equal to the value of the circled baseline datapoint.
     - Next, mark Jared's *revised reading goal* with an 'X' at the appropriate spot on the end-line.
     - Now draw a straight line between the start-line and end-line 'X's. This is your chart's revised aim-line.
8. ***Plot the rest of Jared's progress-monitoring data.*** Chart Jared's data for the final 6 weeks of progress-monitoring (see Weeks 7-12 on the *Student Record Form*). Plot them on the chart. What conclusions do you draw from the chart? Based on these data, should the Teacher Support Team recommend changing Jared's intervention? Keep it in place with no changes? Why?

Student Record Form: Curriculum-Based Measurement: Oral Reading Fluency

Student Name: Jared M. Grade/Classroom: Gr. 4/Mrs. Legione

Reading Skill Level: Mid-Gr.2 (Tchr Estimate) Best Time(s) for CBM Monitoring: T:Th 12-1:40 pm



Step 1: Conduct a Survey-Level Assessment: Use this section to record the student's reading rates in progressively more difficult material.

Date: Th 12/5 Book/Reading Level: GR 2-Bk 2-P 1

	TRW	E	CRW	%CRW
A.	93	3	90	97
B.	72	4	68	94
C.	83	1	82	98

Date: Th 12/5 Book/Reading Level: GR 3-Bk 1-P1

	TRW	E	CRW	%CRW
A.	87	2	85	98
B.	94	3	91	97
C.	78	2	76	97

Date: Th 12/5 Book/Reading Level: GR 3-Bk 2-P1

	TRW	E	CRW	%CRW
A.	62	4	58	94
B.	81	4	77	95
C.	73	3	70	96

Date: Th 12/5 Book/Reading Level: GR 4-P1

	TRW	E	CRW	%CRW
A.	58	5	53	91
B.	61	5	56	92
C.	64	6	58	91

Book/Reading Level: _____ Date: _____

	TRW	E	CRW	%CRW
A.				
B.				
C.				

Book/Reading Level: _____ Date: _____

	TRW	E	CRW	%CRW
A.				
B.				
C.				

Book/Reading Level: _____ Date: _____

	TRW	E	CRW	%CRW
A.				
B.				
C.				

Table 1: Sample Estimates of 'Typical' CBM Instructional Reading Levels By Grade

	Shapiro (1996)		Milwaukee Public Schools (Winter 2000-2001 Local Norms)
Grade	CRW Per Min	Reading Errors	CRW Per Min for Students in 25th-75th Percentile
1.....	40-60	Fewer than 5	22-64
2.....	40-60	Fewer than 5	36-78
3.....	70-100	Fewer than 7	47-88
4.....	70-100	Fewer than 7	60-104
5.....	70-100	Fewer than 7	77-121
6.....	70-100	Fewer than 7	95-146

Step 2: Compute a Student Reading Goal

1. At what grade or book level will the student be monitored? (Refer to results of Step 1: *Survey-Level Assessment*)

   _____

2. What is the student's *baseline* reading rate (# correctly read words per min)? _____CRW Per Min
3. When is the *start date* to begin monitoring the student in reading? _____ / _____ / _____
4. When is the *end date* to stop monitoring the student in reading? _____ / _____ / _____
5. How many instructional weeks are there between the start and end dates? (Round to the nearest week if necessary):

   _____ Instructional Weeks

6. What do you *predict* will be the student's average increase in correctly read words per minute will be for each instructional week of the monitoring period? (See Table 2):

   _____ Weekly Increase in CRW Per Min

7. What will the student's predicted CRW *gain* in reading fluency be at the end of monitoring? (Multiply Item 5 by Item 6): _____
8. What will the student's predicted *reading rate* be at the end of the monitoring period? (Add Items 2 & 7): _____ CRW Per Min

References

Fuchs, L.S., Fuchs, D., Hamlett, C.L., Walz, L., & Germann, G. (1993). Formative evaluation of academic progress: How much growth can we expect? *School Psychology Review*, *22*, 27-48.

Shapiro, E.S. (1996). *Academic skills problems: Direct assessment and intervention*. New York: Guilford Press.

Student Name: _____ Grade/Classroom: _____

Step 2: Collect Baseline Data: Give 3 CBM reading assessments within a one-week period using monitoring-level probes.

Baseline 1

Date: *T 1/14* Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	79	3	76	96
B.	76	2	74	97
C.	66	5	61	92

Baseline 2

Date: *W 1/15* Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	56	4	52	93
B.	70	3	67	96
C.	81	4	77	95

Baseline 3

Date: *F 1/17* Book/Reading Level: _____

	TRW	E	CRW	%CRW
A.	72	3	69	96
B.	74	2	72	97
C.	76	2	74	97

Step 3: Complete CBM Progress-Monitoring Weekly or More Frequently: Record the results of regular monitoring of the student's progress in reading fluency.

1. Date: *W 1/22* Book/Reading Level: *3rd Gr Bk 2-P5*

	TRW	E	CRW	%CRW
A.	89	3	86	97
B.	75	4	71	95
C.	74	4	70	95

2. Date: *W 1/29* Book/Reading Level: *?-P6*

	TRW	E	CRW	%CRW
A.	69	1	68	99
B.	106	3	103	97
C.	79	2	77	97

3. Date: *M 2/3* Book/Reading Level: *?-P7*

	TRW	E	CRW	%CRW
A.	80	3	77	98
B.	78	3	75	96
C.	78	4	74	95

4. Date: *Th 2/13* Book/Reading Level: *?-P8*

	TRW	E	CRW	%CRW
A.	77	2	75	97
B.	79	1	78	99
C.	67	6	61	99

5. Date: *Th 2/27* Book/Reading Level: *?-P9*[1]

	TRW	E	CRW	%CRW
A.	75	1	74	99
B.	80	1	79	99
C.	81	2	79	98

6. Date: *F 3/7* Book/Reading Level: *?-P10*

	TRW	E	CRW	%CRW
A.	72	3	69	96
B.	83	1	82	99
C.	85	1	84	99

7. Date: *M 3/10* Book/Reading Level: *?-P11*

	TRW	E	CRW	%CRW
A.	87	2	85	98
B.	87	3	84	97
C.	82	4	78	95

8. Date: *F 3/21* Book/Reading Level: *?-P12*

	TRW	E	CRW	%CRW
A.	89	1	88	99
B.	86	4	82	95
C.	82	4	78	95

9. Date: *T 3/25* Book/Reading Level: *?-P13*

	TRW	E	CRW	%CRW
A.	82	3	79	96
B.	70	1	69	99
C.	100	2	98	98

10. Date: *W 4/2* Book/Reading Level: *?-P14*

	TRW	E	CRW	%CRW
A.	89	3	86	97
B.	63	3	60	95
C.	92	3	89	97

11. Date: *T 4/8* Book/Reading Level: *?-P15*

	TRW	E	CRW	%CRW
A.	93	3	90	97
B.	88	4	84	95
C.	89	2	87	98

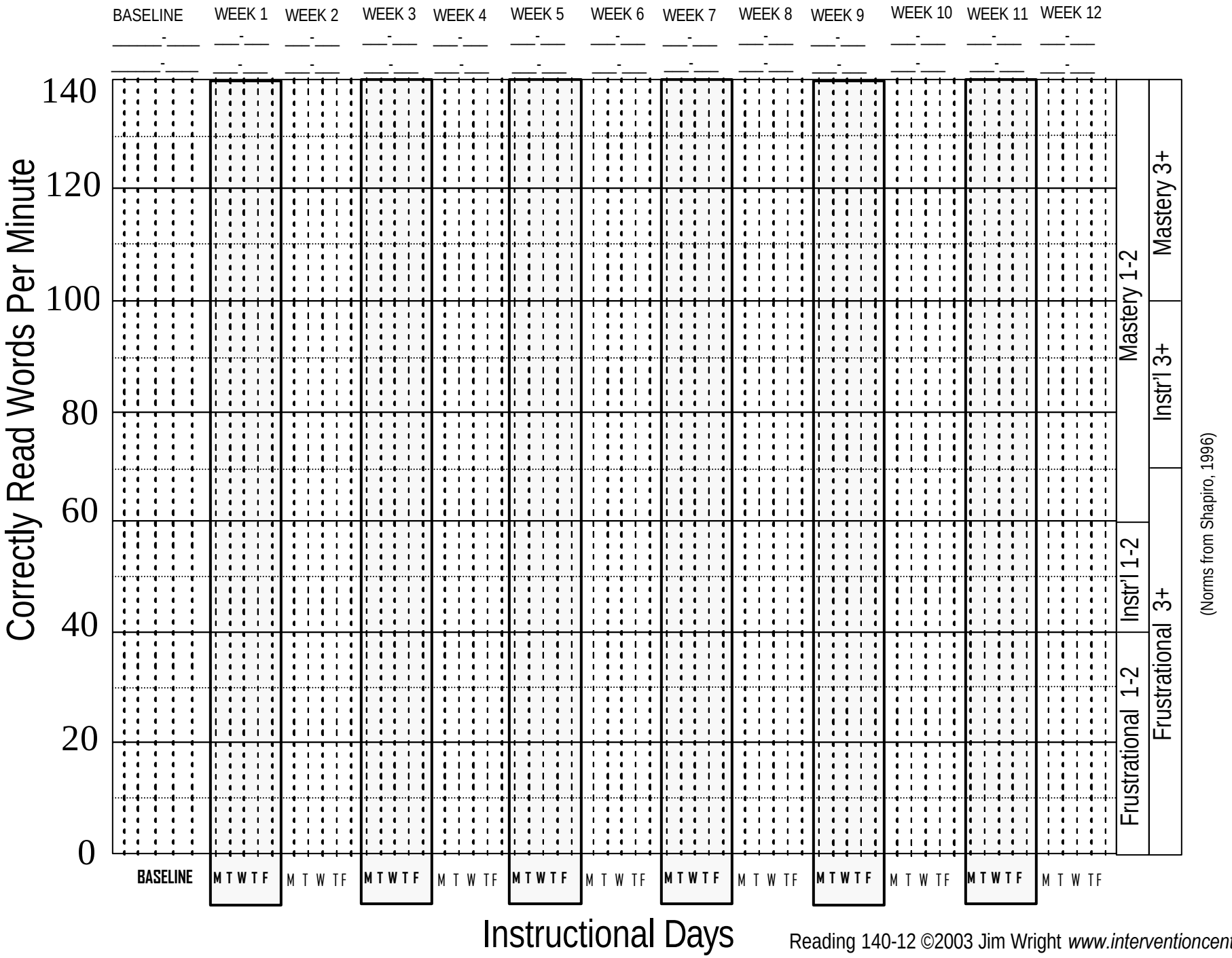
12. Date: *T 4/15* Book/Reading Level: *?-P16*

	TRW	E	CRW	%CRW
A.	89	2	87	98
B.	95	3	92	97
C.	78	2	76	97

Table 2: Predictions for Rates of Reading Growth by Grade
(Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993)
Increase in Correctly Read Words Per Minute for Each Instructional Week

Grade Level	*Realistic Weekly Goal*	*Ambitious Weekly Goal*
Grade 1	2.0	3.0
Grade 2	1.5	2.0
Grade 3	1.0	1.5
Grade 4	0.85	1.1
Grade 5	0.5	0.8
Grade 6	0.3	0.65

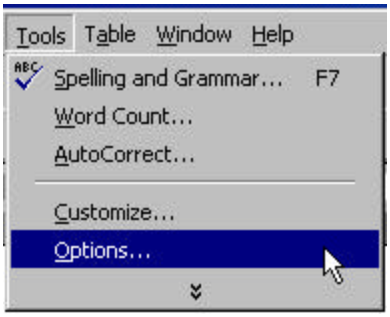
Student: _____ Classrm/Grade: _____ Monitoring Level: _____



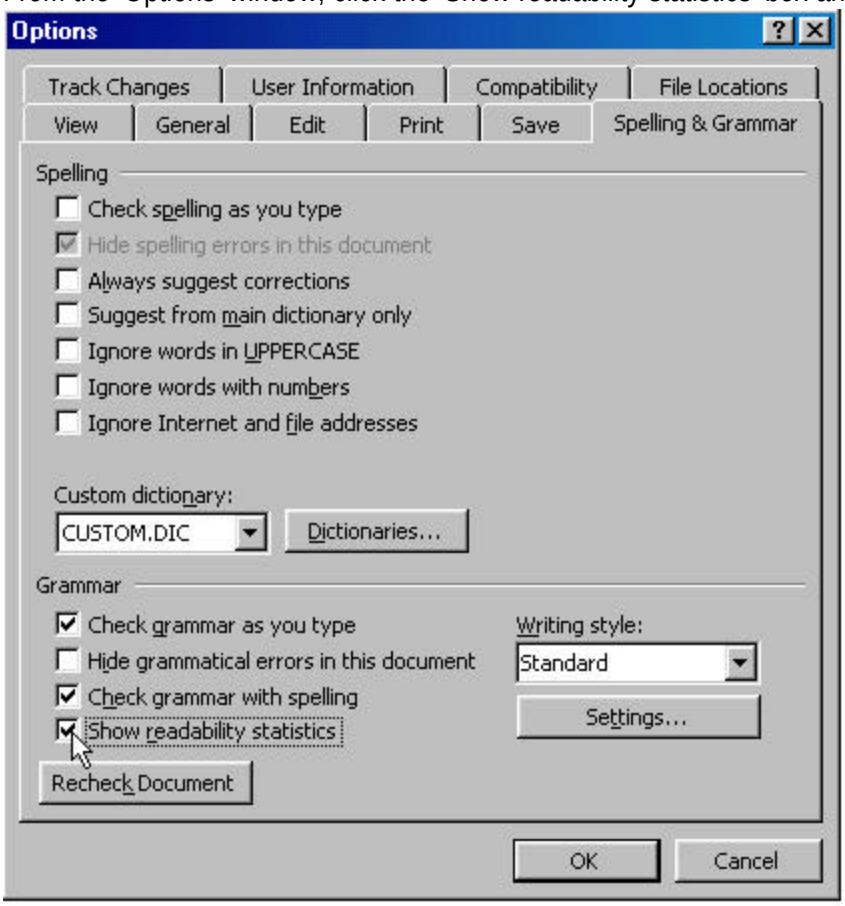
Reading 140-12 ©2003 Jim Wright *www.interventioncentral.org*

Directions for Running a Readability Analysis Using Microsoft Word

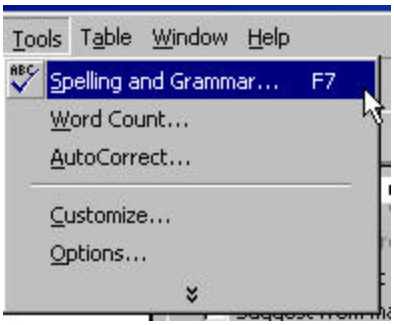
1. Select the 'Tools/Options…' menu choice



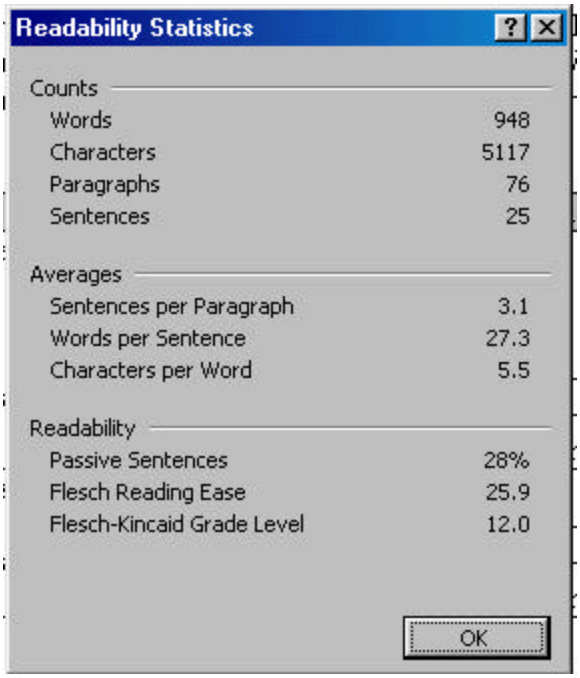
2. From the 'Options' window, click the 'Show readability statistics' box and then click the 'OK'



3. To run a readability check, select the 'Tools>Spelling and Grammar…' menu choice



4. When the spell/grammar check is complete, a window will appear displaying the readability statistics.



NOTE: Here is the explanation from Microsoft about how the Flesch-Kincaid readability formula is calculated:

"**Flesch-Kincaid Grade Level score**

Rates text on a U.S. grade-school level. For example, a score of 8.0 means that an eighth grader can understand the document. For most standard documents, aim for a score of approximately 7.0 to 8.0.

The formula for the Flesch-Kincaid Grade Level score is: (.39 x ASL) + (11.8 x ASW) – 15.59

where:

ASL = average sentence length (the number of words divided by the number of sentences)

ASW = average number of syllables per word (the number of syllables divided by the number of words)"

CBM Math Assessment

RTI-Ready Methods to Monitor Student Academics
Math: Early Math Fluency

□ Quantity Discrimination Fluency	⌛: 1 minute	Administration: 1:1
Description: The student is given a sheet with number pairs. For each number pair, the student must name the larger of the two numbers.		
Where to get materials: • AimsWeb http://www.aimsweb.com/ • Intervention Central http://www.interventioncentral.org (Numberfly Early Math Fluency Probe Creator)		

□ Missing Number Fluency	⌛: 1 minute	Administration: 1:1
Description: The student is given a sheet containing numerous sets of 3 or 4 sequential numbers. For each number series, one of the numbers is missing. The student must name the missing number.		
Where to get materials: • AimsWeb http://www.aimsweb.com/ • Intervention Central http://www.interventioncentral.org (Numberfly Early Math Fluency Probe Creator)		

□ Number Identification Fluency	⌛: 1 minute	Administration: 1:1
Description: The student is given a sheet with numbers in random order. The student gives the name of each number.		
Where to get materials: • AimsWeb http://www.aimsweb.com/ • Intervention Central http://www.interventioncentral.org (Numberfly Early Math Fluency Probe Creator)		

□ Oral Counting Fluency	⌛: 1 minute	Administration: 1:1
Description: The student counts aloud as many words in sequence as possible, starting from zero or one.		
Where to get materials: • The student does not require materials for this assessment. The examiner can make a sheet with numbers listed sequentially from 0-100 to record those numbers that the student can recite in sequence.		

Math: Computation

□ Math Computation Fluency	⏳: 2 minutes	Administration: Group
Description: The student is given a worksheet with single-skill or mixed-skill math computation problems. The student works independently to complete as many problems as possible. The student receives credit for each correct digit appearing in his or her answer.		
Where to get materials: • AimsWeb http://www.aimsweb.com/ • Intervention Central http://www.interventioncentral.org (Math Worksheet Generator) • SuperKids http://www.superkids.com/aweb/tools/math/ (This website allows you to create math computation worksheets for more advanced areas such as fractions, percentages, decimals, and more)		

Math: Applied Problems

□ Math Concepts & Applications	⏳: 6-8 minutes	Administration: Group
Description: Students are given assessment booklets with a mix of applied problem types appropriate to that grade level. (Assessments are available for grades 2-6). A mix of applied problems is included in each assessment, sampling the typical math curriculum for the student's grade (e.g., money skills, time-telling, etc.)		
Where to get materials: • MBSP: Monitoring Basic Skills Progress: Basic Math Kit – Second Edition developed by Drs. Lynn & Dough Fuchs, Vanderbilt University. Available through Pro-Ed: http://www.proedinc.com/		

Math: Vocabulary

□ Math Vocabulary Probes (Howell, 2008)	⏳: 5 minutes	Administration: Group
Description: Students are given a math vocabulary probe consisting of 20 vocabulary items. There are two versions commonly used: (1) The sheet contains vocabulary terms on one side of the sheet and the definitions of those terms—in scrambled order—on the other. The student connects term to its correct definition; (2) The sheet contains only definitions. The student must read each definition and write the correct corresponding vocabulary term.		
Where to get materials: • Math vocabulary probes are developed by the school. Teachers create 'vocabulary pools' that contain the key vocabulary items to be included in probes. From that larger pool, vocabulary items are randomly sampled to create individual probes.		

References

Hosp, M.K., Hosp, J. L., & Howell, K. W. (2007). T*he ABCs of CBM.* New York: Guilford

Howell, K. W. (2008). Best practices in curriculum-based evaluation and advanced reading. In A. Thomas & J. Grimes (Eds.), Best practices in school psychology V (pp. 397-418). Bethesda, MD: National Association of School Psychologists.

Curriculum-Based Measurement Administration & Scoring Guidelines for Math Computation

CBM MATH

Description

There are 2 types of CBM math probes, single-skill worksheets (those containing like problems) and multiple-skill worksheets (those containing a mix of problems requiring different math operations). Single-skill probes give instructors good information about students' mastery of particular problem-types, while multiple-skill probes allow the teacher to test children's math competencies on a range of computational objectives during a single CBM session.

Both types of math probes can be administered either individually or to groups of students. The examiner hands the worksheet(s) out to those students selected for assessment. Next, the examiner reads aloud the directions for the worksheet. Then the signal is given to start, and students proceed to complete as many items as possible within 2 minutes. The examiner collects the worksheets at the end of the assessment for scoring.

Figure 5: A Sampling of Math Computational Goals for Addition, Subtraction, Multiplication, and Division (from Wright, 2002).

Addition
Two 1-digit numbers: sums to 10
Two 3-digit numbers: no regrouping
1- to 2-digit number plus 1- to 2-digit number: regrouping

Subtraction
Two 1-digit numbers: 0 to 9
2-digit number from a 2-digit number: no regrouping
2-digit number from a 2-digit number: regrouping

Multiplication
Multiplication facts: 0 to 9
2-digit number times 1-digit number: no regrouping
3-digit number times 1-digit number: regrouping

Division
Division facts: 0 to 9
2-digit number divided by 1-digit number: no remainder
2-digit number divided by 1-digit number: remainder

Wright, J. (2002) *Curriculum-Based Assessment Math Computation Probe Generator: Multiple-Skill Worksheets in Mixed Skills*. Retrieved August 13, 2006, from http://www.lefthandlogic.com/htmdocs/tools/mathprobe/allmult.shtml

Creating a measurement pool for math computational probes

The first task of the instructor in preparing CBM math probes is to define the computational skills to be assessed. Many districts have adopted their own math curriculum that outlines the various computational

skills in the order in which they are to be taught. Teachers may also review scope-and-sequence charts that accompany math textbooks when selecting CBM computational objectives.

The order in which math computational skills are taught, however, probably does not vary a great deal from district to district. Figure 5 contains sample computation goals for addition, subtraction, multiplication, and division.

Instructors typically are interested in employing CBM to monitor students' acquisition of skills in which they are presently being instructed. However, teachers may also want to use CBM as a skills check-up to assess those math objectives that students have been taught in the past or to "preview" a math group's competencies in computational material that will soon be taught.

Preparing CBM Math Probes

After computational objectives have been selected, the instructor is ready to prepare math probes. The teacher may want to create single-skills probes, multipleskill probes, or both types of CBM math worksheets.

Creating the Single-skill Math Probe

As the first step in putting together a single-skill math probe, the teacher will select one computational objective as a guide. The measurement pool, then, will consist of problems randomly

---

Figure 6: Example of a single-skill math probe: Three to five 3- and 4-digit numbers: no regrouping

105 + 600 + 293	2031 + 531 + 2322	111 + 717 + 260	634 + 8240 + 203

---

constructed that conform to the computational objective chosen. For example, the instructor may select the following computational objective (Figure 6) as the basis for a math probe.

The teacher would then construct a series of problems that match the computational goal, as in Figure 6. In general, single-skill math probes should contain between 80 and 200 problems, and worksheets should have items on both the front and back of the page. Adequate space should also be left for the student's computations, especially with more complex problems such as long division.

Creating the Multiple-skill Math Probe

To assemble a multiple-skill math probe, the instructor will first select the range of math operations and of problem-types that will make up the probe. The teacher will probably want to consult the district math

---

Figure 7: Example of a multiple-skill math probe:
Division: 3-digit number divided by 1-digit number: no remainder
Subtraction: 2-digit number from a 2-digit number: regrouping
Multiplication" 3-digit number times 1-digit number: no regrouping
Division: Two 3-digit numbers: no regrouping

9/431	20 -18	113 x 2	106 + 172 + 200 + 600

---

curriculum, appropriate scope –and sequence charts, or the computational-goal chart included in this manual when selecting the kinds of problems to include in the multiple-skill probe. Once the computational objectives have been chosen, the teacher can make up a worksheet of mixed math facts conforming to those objectives. Using our earlier example, the teacher who wishes to estimate the proficiency of his 4th-grade math group may decide to create a multiple-skills CBM probe. He could choose to sample only those problem-types that his students have either mastered or are presently being instructed in. Those skills are listed in Figure 7, with sample problems that might appear on the worksheet of mixed math facts.

Materials needed for giving CBM math probes

Student copy of CBM math probe (either single- or multiple-skill)
Stopwatch
Pencils for students

Administration of CBM math probes

The examiner distributes copies of one or more math probes to all the students in the group. (Note: These probes may also be administered individually). The examiner says to the students:

The sheets on your desk are math facts.

If the students are to complete a single-skill probe, the examiner then says: *All the problems are [addition or subtraction or multiplication or division] facts.*

If the students are to complete a multiple-skill probe, the examiner then says: *There are several types of problems on the sheet. Some are addition, some are subtraction, some are multiplication, and some are division* [as appropriate]. *Look at each problem carefully before you answer it.*

When I say 'start,' turn them over and begin answering the problems. Start on the first problem on the left on the top row [point]. *Work across and then go to the next row. If you can't answer the problem, make an 'X' on it and go to the next one. If you finish one side, go to the back. Are there any questions?* Say, *Start.*

The examiner starts the stopwatch. While the students are completing worksheets, the examiner and any other adults assisting in the assessment circulate around the room to ensure that students are working on the correct sheet, that they are completing problems in the correct order (rather than picking out only the easy items), and that they have pencils, etc.

After 2 minutes have passed, the examiner says *Stop.* CBM math probes are collected for scoring.

Scoring

Traditional approaches to computational assessment usually give credit for the total number of correct answers appearing on a worksheet. If the answer to a problem is found to contain one or more incorrect digits, that problem is marked wrong and receives no credit. In contrast to this all-or-nothing marking system, CBM assigns credit to each individual correct digit appearing in the solution to a math fact.

On the face of it, a math scoring system that awards points according to the number of correct digits may appear unusual, but this alternative approach is grounded in good academic-assessment research and practice. By separately scoring each digit in the answer of a computation problem, the instructor is better able to recognize and to give credit for a student's partial math competencies. Scoring computation problems by the digit rather than as a single answer also allows for a more minute analysis of a child's number skills.

Imagine, for instance, that a student was given a CBM math probe consisting of addition problems, sums less than or equal to 19 (incorrect digits appear in boldface and italics):

Figure 8: Example of completed problems from a single-skill math probe

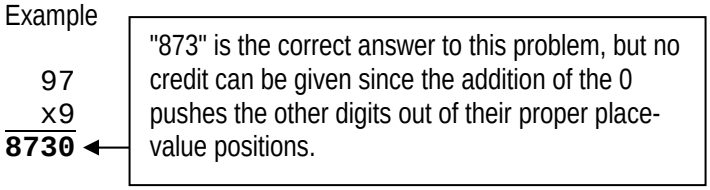
105	2031	111	634
+ 600	+ 531	+ 717	+ 8240
+ 293	+ 2322	+ 260	+ 203
9***8***8	4884	108***7***	9***0***77

If the answers in Figure 8 were scored as either correct or wrong, the child would receive a score of 1 correct answer out of 4 possible answers (25 percent). However, when each individual digit is scored, it becomes clear that the student actually correctly computed 12 of 15 possible digits (80 percent). Thus, the CBM procedure of assigning credit to each correct digit demonstrates itself to be quite sensitive to a student's emerging, partial competencies in math computation.

The following scoring rules will aid the instructor in marking single- and multiple-skill math probes:

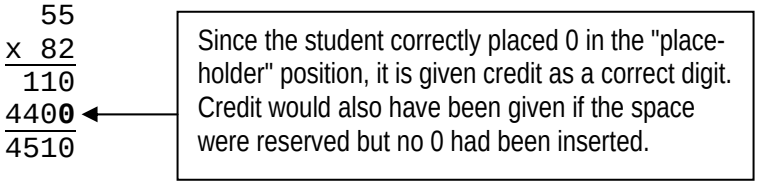
- Individual correct digits are counted as correct.
  Reversed or rotated digits are not counted as errors unless their change in position makes them appear to be another digit (e.g., 9 and 6).

- Incorrect digits are counted as errors.
  Digits that appear in the wrong place value, even if otherwise correct, are scored as errors.
  Example

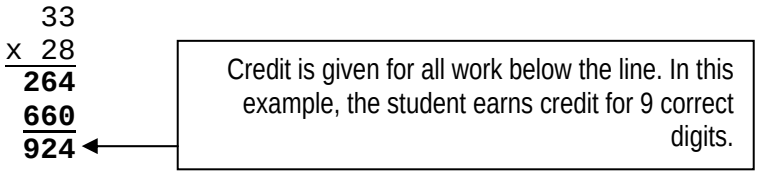


- The student is given credit for "place-holder" numerals that are included simply to correctly align the problem. As long as the student includes the correct space, credit is given whether or not a "0" has actually been inserted.

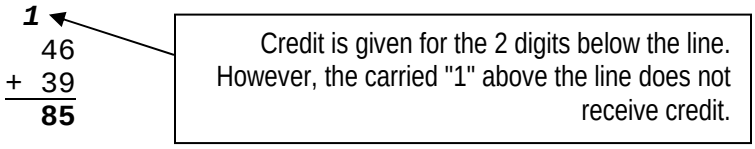
  Example



- In more complex problems such as advanced multiplication, the student is given credit for all correct numbers that appear below the line.
  Example



- Credit is not given for any numbers appearing above the line (e.g., numbers marked at the top of number columns to signify regrouping).
  Example



Reference: Wright, J. (n.d.). Curriculum-based measurement: A manual for teachers. Retrieved September 23, 2006, from http://www.jimwrightonline.com/pdfdocs/cbaManual.pdf

APPENDIX D: List of computational goals

COMPUTATIONAL GOALS OF MATH CURRICULUM (ADAPTED FROM SHAPIRO, 1989)

The computational skills listed below are arranged in ascending order of difficulty. Please identify(1) the skills which you have instructed in the classroom, (2) the skills that the student has mastered, and (3) the skills with which the student is currently having difficulty.

MASTERED : Place a check under the M column indicating the skills which the student has mastered.

INSTRUCTED : Place a check under the I column indicating the skills which you have instructed.

DIFFICULTY : Place a check under the D column indicating the skills with which the student is having difficulty.

M	I	D	
			Grade 1
__	__	__	1. Add two one-digit numbers: sums to 10.
__	__	__	2. Subtract two one-digit numbers: combinations to 10.
			Grade 2
__	__	__	3. Add two one-digit numbers: sums 11 to 19.
__	__	__	4. Add a one-digit number to a two-digit number--no regrouping.
__	__	__	5. Add a two-digit number to a two-digit number--no regrouping.
__	__	__	6. Add a three-digit number to a three-digit number--no regrouping.
__	__	__	7. Subtract a one-digit number from a one- or two-digit number: combinations to 18.
__	__	__	8. Subtract a one-digit number from a two-digit number--no regrouping.
__	__	__	9. Subtract a two-digit number from a two-digit number--no regrouping.
__	__	__	10. Subtract a three-digit number from a three-digit number--no regrouping.
__	__	__	11. Multiplication facts--0's, 1's, 2's.
			Grade 3
__	__	__	12. Add three or more one-digit numbers.
__	__	__	13. Add three or more two-digit numbers--no regrouping.
__	__	__	14. Add three or more three- and four-digit numbers--no regrouping.
__	__	__	15. Add a one-digit number to a two-digit number with regrouping.
__	__	__	16. Add a two-digit number to a two-digit number with regrouping.
__	__	__	17. Add a two-digit number to a three-digit number with regrouping from the units to the tens column only.
__	__	__	18. Add a two-digit number to a three-digit number with regrouping from the tens to the hundreds column only.
__	__	__	19. Add a two-digit number to a three-digit number with regrouping from the units to the tens column and from the tens to the hundreds column.
__	__	__	20. Add a three-digit number to a three-digit number with regrouping from the units to the tens column only.
__	__	__	21. Add a three-digit number to a three-digit number with regrouping from the tens to the hundreds column only.

M I D

__ __ __ 22. Add a three-digit number to a three-digit number with regrouping from the units to the tens column and from the tens to the hundreds column.
__ __ __ 23. Add a four-digit number to a four-digit number with regrouping in one to three columns.
__ __ __ 24. Subtract two four-digit numbers-no regrouping.
__ __ __ 25. Subtract a one-digit number from a two-digit number with regrouping.
__ __ __ 26. Subtract a two-digit number from a two-digit number with regrouping.
__ __ __ 27. Subtract a two-digit number from a three-digit number with regrouping from the units to the tens column only.
__ __ __ 28. Subtract a two-digit number from a three-digit number with regrouping from the tens to the hundreds column only.
__ __ __ 29. Subtract a two-digit number from a three-digit number with regrouping from the units to the tens column and from the tens to the hundreds column.
__ __ __ 30. Subtract a three-digit from a three-digit number with regrouping from the units to the tens column only.
__ __ __ 31. Subtract a three-digit number from a three-digit number with regrouping from the tens to the hundreds column only.
__ __ __ 32. Subtract a three-digit number from a three-digit number with regrouping from the units to the tens column and from the tens to the hundreds column.
__ __ __ 33. Multiplication facts--3 to 9.

Grade 4

__ __ __ 34. Add a five- or six-digit number to a five- or six-digit number with regrouping in any columns.
__ __ __ 35. Add three or more two-digit numbers with regrouping.
__ __ __ 36. Add three or more three-digit numbers with regrouping with regrouping in any columns.
__ __ __ 37. Subtract a five- or six-digit number from a five- or six-digit number with regrouping in any columns.
__ __ __ 38. Multiply a two-digit number by a one-digit number with no regrouping.
__ __ __ 39. Multiply a three-digit number by a one-digit number with no regrouping.
__ __ __ 40. Multiply a two-digit number by a one-digit number with no regrouping.
__ __ __ 41. Multiply a three-digit number by a one-digit number with regrouping.
__ __ __ 42. Division facts--0 to 9.
__ __ __ 43. Divide a two-digit number by a one-digit number with no remainder.
__ __ __ 44. Divide a two-digit number by a one-digit number with remainder.
__ __ __ 45. Divide a three-digit number by a one digit number with remainder.
__ __ __ 46. Divide a four-digit number by a one-digit number with remainder.

M	I	D	Grade 5
__	__	__	47. Multiply a two-digit number by a two-digit number with regrouping.
__	__	__	48. Multiply a three-digit number by a two-digit number with regrouping.
__	__	__	49. Multiply a three-digit number by a three-digit number with regrouping.

List of computational goals taken from Shapiro, Edward S. (1989). Academic skills problems: Direct assessment and intervention. New York: Guilford Press.

Curriculum-Based Assessment Mathematics
Multiple-Skills Computation Probe: Student Copy

Student: Date: _____

727,162 +30,484	42,286 -29,756	156 x623	_____ 52/2207
146,569 +532,260	33,516 -21,366	192 x371	_____ 43/4742

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Click for Student Worksheet

Curriculum-Based Assessment Mathematics
Multiple-Skills Computation Probe: Examiner Copy

Item 1:
6 CD/6 CD Total
ADDITION: 5- to 6-digit number plus 5- to 6-digit number: Regrouping in any column

```
  727,162
+ 30,484
  757,646
```

Item 2:
5 CD/11 CD Total
SUBTRACTION: 5-digit number from 5-digit number: regrouping in any column

```
  42,286
- 29,756
  12,530
```

Item 3:
17 CD/28 CD Total
MULTIPLICATION: 3-digit number times 3-digit number: regrouping

```
   156
x 623
   468
  312-
 936--
97,188
```

Item 4:
15 CD/43 CD Total
DIVISION: 4-digit number divided by 2-digit number: remainder

```
   42 r23
52/2207
 -208
   127
  -104
    23
```

Item 5:
6 CD/49 CD Total
ADDITION: 5- to 6-digit number plus 5- to 6-digit number: Regrouping in any column

```
  146,569
+532,260
  678,829
```

Item 6:
5 CD/54 CD Total
SUBTRACTION: 5-digit number from 5-digit number: regrouping in any column

```
  33,516
- 21,366
  12,150
```

Item 7:
18 CD/72 CD Total
MULTIPLICATION: 3-digit number times 3-digit number: regrouping

```
   192
x 371
   192
  1344-
 576--
71,232
```

Item 8:
13 CD/85 CD Total
DIVISION: 4-digit number divided by 2-digit number: remainder

```
   110 r12
43/4742
 -43
   44
  -43
    12
```

---

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Click for Student Worksheet

Early Math Fluency CBM Probe: Quantity Discrimination

This introduction to the Quantity Discrimination probe provides information about the preparation, administration, and scoring of this Early Math CBM measure. Additionally, it offers brief guidelines for integrating this assessment into a school-wide 'Response-to-Intervention' model.

Quantity Discrimination: Description (Clarke & Shinn, 2005; Gersten, Jordan & Flojo, 2005)

The student is given a sheet containing pairs of numbers. In each number pair, one number is larger than the other. The numbers in each pair are selected from within a predefined range (e.g., no lower than 0 and no higher than 20). During a one-minute timed assessment, the student identifies the larger number in each pair, completing as many items as possible while the examiner records any Quantity Discrimination errors.

Quantity Discrimination: Preparation

The following materials are needed to administer Quantity Discrimination (QD) Early Math CBM probes:

- Student and examiner copies of a QD assessment probe. (Note: Customized QD probes can be created conveniently and at no cost using Numberfly, a web-based application. Visit Numberfly at *http://www.interventioncentral.org/php/numberfly/numberfly.php*).

- A pencil, pen, or marker

- A stopwatch

Quantity Discrimination: Directions for Administration

1. The examiner sits with the student in a quiet area without distractions. The examiner sits at a table across from the student.

2. The examiner says to the student:

   "The sheet on your desk has pairs of numbers. In each set, one number is bigger than the other."

   "When I say, 'start,' tell me the name of the number that is larger in each pair. Start at the top of this page and work across the page [demonstrate by pointing]. *Try to figure out the larger number for each example.. When you come to the end of a row, go to the next row. Are there any questions?* [Pause] *Start. "*

3. The examiner begins the stopwatch when the student responds aloud to the first item. If the student hesitates on a number for 3 seconds or longer on a Quantity Discrimination item, the examiner says, *"Go to the next one."* (If necessary, the examiner points to the next number as a student prompt.)

4. The examiner marks each Quantity Discrimination error by marking a slash (/) through the incorrect response item on the examiner form.

5. At the end of one minute, the examiner says, *"Stop"* and writes in a right-bracket symbol ( ]) on the examiner form after the last item that the student had attempted when the time expired. The examiner then collects the student Quantity Discrimination sheet.

Quantity Discrimination: Scoring Guidelines

Correct QD responses include:

- Quantity Discriminations read correctly
- Quantity Discriminations read incorrectly but corrected by the student within 3 seconds

Incorrect QD responses include:

- The student's reading the smaller number in the QD number pair
- Correct QD responses given after hesitations of 3 seconds or longer
- The student's calling out a number other than appears in the QD number pair
- Response items skipped by the student

To calculate a Quantity Discrimination fluency score, the examiner:

1. counts up all QD items that the student attempted to answer and
2. subtracts the number of QD errors from the total number attempted.
3. The resulting figure is the number of correct Quantity Discrimination items completed.(QD fluency score).

Quantity Discrimination Probes as Part of a Response to Intervention Model

- Universal Screening: To proactively identify children who may have deficiencies in development of foundation math concepts, or 'number sense' (Berch, 2003), schools may choose to screen all kindergarten and first grade students using Quantity Discrimination probes. Those screenings would take place in fall, winter, and spring. Students who fall below the 'cutpoint' of the 35th percentile (e.g., Jordan & Hanich, 2003).of the grade norms on the QD task would be identified as having moderate deficiencies and given additional interventions to build their 'number sense' skills.

- Tier I (Classroom-Based) Interventions: Teachers can create Quantity Discrimination probes and use them independently to track the progress of students who show modest delays in their math foundation skills.

- Tier II (Individualized) Interventions. Students with more extreme academic delays may be referred to a school-based problem-solving team, which will develop more intensive, specialized interventions to target the student's academic deficits (Wright, 2007). Quantity Discrimination probes can be used as one formative measure to track student progress with Tier II interventions to build foundation math skills.

Quantity Discrimination: Measurement Statistics

Test-Retest Reliability Correlations for Quantity Discrimination Probes		
Time Span	*Correlation*	*Reference*
13-week interval	0.85	Clarke & Shinn (2005)
26-week interval	0.86	Clarke & Shinn (2005)

Predictive Validity Correlations for Quantity Discrimination Probes		
Predictive Validity Measure	*Correlation*	*Reference*
Curriculum-Based Measurement Math Computation Fluency Probes: Grade 1 Addition & Subtraction (Fall Administration of QD Probe and Spring Administration of Math Computation Probe)	0.67	Clarke & Shinn (2005)
Woodcock-Johnson Tests of Achievement: Applied Problems subtest (Fall Administration of QD Probe and Spring Administration of WJ-ACH subtest)	0.79	Clarke & Shinn (2005)
Number Knowledge Test	0.53	Chard, Clarke, Baker, Otterstedt, Braun & Katz.(2005) cited in Gersten, Jordan & Flojo (2005)

References

Chard, D. J., Clarke, B., Baker, S., Otterstedt, J., Braun, D., & Katz, R. (2005). Using measures of number sense to screen for difficulties in mathematics: Preliminary findings. *Assessment For Effective Intervention, 30*(2), 3-14.

Clarke, B., & Shinn, M. (2004). A preliminary investigation into the identification and development of early mathematics curriculum-based measurement. *School Psychology Review, 33*, 234–248.

Gersten, R., Jordan, N.C., & Flojo, J.R. (2005). Early identification and interventions for students with mathematics difficulties. *Journal of Learning Disabilities, 38,* 293-304.

Jordan, N. C. & Hanich, L. B. (2003). Characteristics of children with moderate mathematics deficiencies: A longitudinal perspective. *Learning Disabilities Research and Practice, 18*(4), 213-221.

Berch, D. B. (2003). Making sense of number sense: Implications for children with mathematical disabilities. *Journal of Learning Disabilities, 38,* 333-339..

Wright, J. (2007). *The RTI toolkit: A practical guide for schools*. Port Chester, NY: National Professional Resources, Inc.

Early Math Fluency CBM Probe: Missing Number

This introduction to the Missing Number probe provides information about the preparation, administration, and scoring of this Early Math CBM measure. Additionally, it offers brief guidelines for integrating this assessment into a school-wide 'Response-to-Intervention' model.

Missing Number: Description (Clarke & Shinn, 2005; Gersten, Jordan & Flojo, 2005)

The student is given a sheet containing multiple number series. Each series consists of 3-4 numbers that appear in sequential order. The numbers in each short series are selected to fall within a predefined range (e.g., no lower than 0 and no higher than 20). In each series, one number is left blank (e.g., '1 2 _ 4').During a one-minute timed assessment, the student states aloud the missing number in as many response items as possible while the examiner records any Missing Number errors.

Missing Number: Preparation

The following materials are needed to administer Missing Number (MN) Early Math CBM probes:

- Student and examiner copies of a MN assessment probe. (Note: Customized MN probes can be created conveniently and at no cost using Numberfly, a web-based application. Visit Numberfly at *http://www.interventioncentral.org/php/numberfly/numberfly.php*).

- A pencil, pen, or marker

- A stopwatch

Missing Number: Directions for Administration

1. The examiner sits with the student in a quiet area without distractions. The examiner sits at a table across from the student.

2. The examiner says to the student:

   "The sheet on your desk has sets of numbers. In each set, a number is missing."

   "When I say, 'start,' tell me the name of the number that is missing from each set of numbers. Start at the top of this page and work across the page [demonstrate by pointing]. *Try to figure out the missing number for each example.. When you come to the end of a row, go to the next row. Are there any questions?* [Pause] *Start. "*

3. The examiner begins the stopwatch when the student reads the first number aloud. If the student hesitates on a number for 3 seconds or longer on a Missing Number item, the examiner says the correct number aloud and says, *"Go to the next one."* (If necessary, the examiner points to the next number as a student prompt.)

4. The examiner marks each Missing Number error by marking a slash (/) through the incorrect response item on the examiner form.

5. At the end of one minute, the examiner says, *"Stop"* and writes in a right-bracket symbol ( ]) on the examiner form after the last item that the student had attempted when the time expired. The examiner then collects the student Missing Number sheet.

Missing Number: Scoring Guidelines

Correct MN responses include:

- Missing numbers read correctly
- Missing numbers read incorrectly but corrected by the student within 3 seconds

Incorrect MN responses include:

- Missing numbers read incorrectly
- Missing numbers read correctly after hesitations of 3 seconds or longer
- Response items skipped by the student

To calculate a Missing Number fluency score, the examiner:

1. counts up all MN items that the student attempted to read aloud and
2. subtracts the number of MN errors from the total number attempted.
3. The resulting figure is the number of correct Missing Number items completed.(MN fluency score).

Missing Number Probes as Part of a Response to Intervention Model

- Universal Screening: To proactively identify children who may have deficiencies in development of foundation math concepts, or 'number sense' (Berch, 2003), schools may choose to screen all kindergarten and first grade students using Missing Number probes. Those screenings would take place in fall, winter, and spring. Students who fall below the 'cutpoint' of the 35th percentile (e.g., Jordan & Hanich, 2003).of the grade norms on the MN task would be identified as having moderate deficiencies and given additional interventions to build their 'number sense' skills.

- Tier I (Classroom-Based) Interventions: Teachers can create Missing Number probes and use them independently to track the progress of students who show modest delays in their math foundation skills.

- Tier II (Individualized) Interventions. Students with more extreme academic delays may be referred to a school-based problem-solving team, which will develop more intensive, specialized interventions to target the student's academic deficits (Wright, 2007). Missing Number probes can be used as one formative measure to track student progress with Tier II interventions to build foundation math skills.

Missing Number: Measurement Statistics

Test-Retest Reliability Correlations for Missing Number Probes		
Time Span	*Correlation*	*Reference*
13-week interval	0.79	Clarke & Shinn (2005)

26-week interval	0.81	Clarke & Shinn (2005)

Predictive Validity Correlations for Missing Number Probes		
Predictive Validity Measure	*Correlation*	*Reference*
Curriculum-Based Measurement Math Computation Fluency Probes: Grade 1 Addition & Subtraction (Fall Administration of MN Probe and Spring Administration of Math Computation Probe)	0.67	Clarke & Shinn (2005)
Woodcock-Johnson Tests of Achievement: Applied Problems subtest (Fall Administration of MNF Probe and Spring Administration of WJ-ACH subtest)	0.72	Clarke & Shinn (2005)
Number Knowledge Test	0.61	Chard, Clarke, Baker, Otterstedt, Braun & Katz.(2005) cited in Gersten, Jordan & Flojo (2005)

References

Chard, D. J., Clarke, B., Baker, S., Otterstedt, J., Braun, D., & Katz, R. (2005). Using measures of number sense to screen for difficulties in mathematics: Preliminary findings. *Assessment For Effective Intervention, 30*(2), 3-14.

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Wright, J. (2007). *The RTI toolkit: A practical guide for schools*. Port Chester, NY: National Professional Resources, Inc.

Early Math Fluency CBM Probe: Number Identification

This introduction to the Number Identification probe provides information about the preparation, administration, and scoring of this Early Math CBM measure. Additionally, it offers brief guidelines for integrating this assessment into a school-wide 'Response-to-Intervention' model.

Number Identification: Description (Clarke & Shinn, 2005; Gersten, Jordan & Flojo, 2005)

The student is given a sheet containing rows of randomly generated numbers (e.g., ranging from 0 to 20). During a one-minute timed assessment, the student reads aloud as many numbers as possible while the examiner records any Number Identification errors.

Number Identification: Preparation

The following materials are needed to administer Number Identification (NID) Early Math CBM probes:

- Student and examiner copies of a NID assessment probe. (Note: Customized NID probes can be created conveniently and at no cost using Numberfly, a web-based application. Visit Numberfly at *http://www.interventioncentral.org/php/numberfly/numberfly.php*).

- A pencil, pen, or marker

- A stopwatch

Number Identification: Directions for Administration

1. The examiner sits with the student in a quiet area without distractions. The examiner sits at a table across from the student.

2. The examiner says to the student:

   "The sheet on your desk has rows of numbers."

   "When I say, 'start,' begin reading the numbers aloud. Start at the top of this page and read across the page [demonstrate by pointing]*. Try to read each number. When you come to the end of a row, go to the next row. Are there any questions?* [Pause] *Start. "*

3. The examiner begins the stopwatch when the student reads the first number aloud. If the student hesitates on a number for 3 seconds or longer, the examiner says, *"Go to the next one."* (If necessary, the examiner points to the next number as a student prompt.)

4. The examiner marks each Number Identification error by marking a slash (/) through the incorrectly read number on the examiner form.

5. At the end of one minute, the examiner says, *"Stop"* and writes in a right-bracket symbol ( ]) on the examiner form from the point in the number series that the student had reached when the time expired. The examiner then collects the student Number Identification sheet.

Number Identification: Scoring Guidelines

Correct NID responses include:

- Numbers read correctly
- Numbers read incorrectly but corrected by the student within 3 seconds

Incorrect NID responses include:

- Numbers read incorrectly
- Numbers read correctly after hesitations of 3 seconds or longer
- Numbers skipped by the student

To calculate a Number Identification fluency score, the examiner:

1. counts up all numbers that the student attempted to read aloud and
2. subtracts the number of errors from the total of numbers attempted.
3. The resulting figure is the number of correct numbers identified.(NID fluency score).

Number Identification Probes as Part of a Response to Intervention Model

- Universal Screening: To proactively identify children who may have deficiencies in development of foundation math concepts, or 'number sense' (Berch, 2003), schools may choose to screen all kindergarten and first grade students using Number Identification probes. Those screenings would take place in fall, winter, and spring. Students who fall below the 'cutpoint' of the 35th percentile (e.g., Jordan & Hanich, 2003).of the grade norms on the NID task would be identified as having moderate deficiencies and given additional interventions to build their 'number sense' skills.

- Tier I (Classroom-Based) Interventions: Teachers can create Number Identification probes and use them independently to track the progress of students who show modest delays in their math foundation skills.

- Tier II (Individualized) Interventions. Students with more extreme academic delays may be referred to a school-based problem-solving team, which will develop more intensive, specialized interventions to target the student's academic deficits (Wright, 2007). Number Identification probes can be used as one formative measure to track student progress with Tier II interventions to build foundation math skills.

Number identification: Measurement Statistics

Test-Retest Reliability Correlations for Number Identification Probes		
Time Span	*Correlation*	*Reference*
13-week interval	0.85	Clarke & Shinn (2005)
26-week interval	0.76	Clarke & Shinn (2005)

Predictive Validity Correlations for Number Identification Probes		
Predictive Validity Measure	*Correlation*	*Reference*
Curriculum-Based Measurement Math Computation Fluency Probes: Grade 1 Addition & Subtraction (Fall Administration of MN Probe and Spring Administration of Math Computation Probe)	0.60	Clarke & Shinn (2005)
Woodcock-Johnson Tests of Achievement: Applied Problems subtest (Fall Administration of NID Probe and Spring Administration of WJ-ACH subtest)	0.72	Clarke & Shinn (2005)
Number Knowledge Test	0.58	Chard, Clarke, Baker, Otterstedt, Braun & Katz.(2005) cited in Gersten, Jordan & Flojo (2005)

References

Chard, D. J., Clarke, B., Baker, S., Otterstedt, J., Braun, D., & Katz, R. (2005). Using measures of number sense to screen for difficulties in mathematics: Preliminary findings. *Assessment For Effective Intervention, 30*(2), 3-14.

Clarke, B., & Shinn, M. (2004). A preliminary investigation into the identification and development of early mathematics curriculum-based measurement. *School Psychology Review, 33*, 234–248.

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Jordan, N. C. & Hanich, L. B. (2003). Characteristics of children with moderate mathematics deficiencies: A longitudinal perspective. *Learning Disabilities Research and Practice, 18*(4), 213-221.

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CBM Writing Assessment

Written Expression

Description

CBM Writing probes are simple to administer but offer a variety of scoring options. As with math and spelling, writing probes may be given individually or to groups of students. The examiner prepares a lined composition sheet with a story-starter sentence or partial sentence at the top. The student thinks for 1 minute about a possible story to be written from the story-starter, then spends 3 minutes writing the story. The examiner collects the writing sample for scoring. Depending on the preferences of the teacher, the writing probe can be scored in several ways (see below).

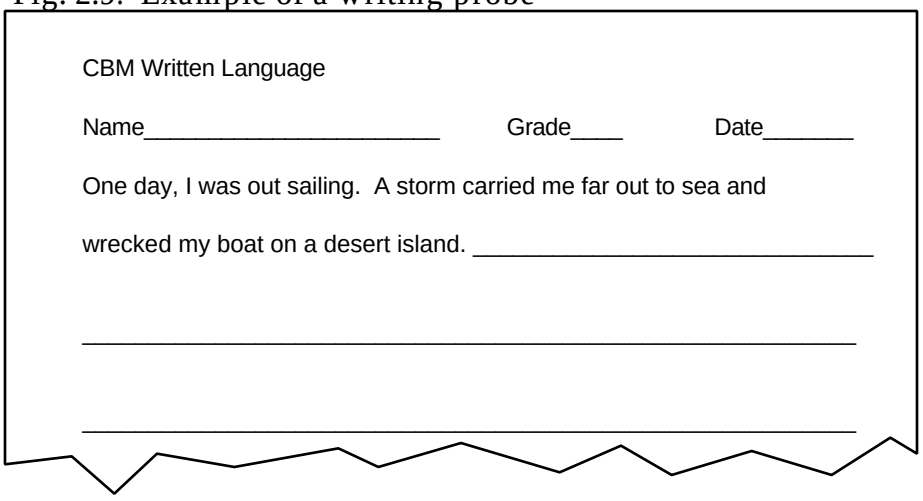
Creating a measurement pool for writing probes

Since writing probes are essentially writing opportunities for students, they require minimal advance preparation. The measurement pool for writing probes would be a collection of grade-appropriate story-starters, from which the teacher would randomly select a story-starter for each CBM writing assessment. Writing texts are often good sources for lists of story-starters; teachers may also choose to write their own.

Preparing CBM writing probes

The teacher selects a story-starter from the measurement pool and places it at the top of a lined composition sheet. The story-starter should avoid wording that encourages students to generate lists. It should also be open-ended, requiring the writer to build a narrative rather than simply to write down a "Yes" or

Fig. 2.9: Example of a writing probe



"No" response. The CBM writing probe in Figure 2.9 is a good example of how a such a probe might appear. This particular probe was used in a 5th-grade classroom.

Materials needed for giving CBM writing probes

- o Student copy of CBM writing probe with story-starter
- o Stopwatch
- o Pencils for students

Administration of CBM writing probes

The examiner distributes copies of CBM writing probes to all the students in the group. (Note: These probes may also be administered individually). The examiner says to the students:

> *I want you to write a story. I am going to read a sentence to you first, and then I want you to write a short story about what happens. You will have 1 minute to think about the story you will write and then have 3 minutes to write it. Do your best work. If you don't know how to spell a word, you should guess. Are there any questions?*
>
> *For the next minute, think about . . .* [insert story-starter]. The examiner starts the stopwatch.
>
> At the end of 1 minute, the examiner says, *Start writing.*
>
> While the students are writing, the examiner and any other adults helping in the assessment circulate around the room. If students stop writing before the 3-minute timing period has ended, monitors encourage them to continue writing.
>
> After 3 additional minutes, the examiner says, *Stop writing.* CBM writing probes are collected for scoring.

Scoring

The instructor has several options when scoring CBM writing probes. Student writing samples may be scored according to the (1) number of words written, (2) number of letters written, (3) number of words correctly spelled, or (4) number of writing units placed in correct sequence. Scoring methods differ both in the amount of time that they require of the instructor and in the quality of information that they provide about a student's writing skills. Advantages and potential limitations of each scoring system are presented below.

1. Total words--The examiner counts up and records the total number of words written during the 3-minute writing probe. Misspelled words are included in the tally, although numbers written in numeral form (e.g., 5, 17) are not counted. Calculating total words is the quickest of scoring methods. A drawback, however, is that it yields only a rough estimate of writing fluency (that is, of how quickly the student can put words on paper) without examining the accuracy of spelling, punctuation, and other writing conventions. The CBM writing sample in Figure

2.10 was written by a 6th-grade student:

Fig. 2.10: CBM writing sample scored for total words

```
I woud drink water from the ocean.....07
and I woud eat the fruit off of.......08
the trees.  Then I woud bilit a.......07
house out of trees, and I woud........07
gather firewood to stay warm.  I......06
woud try and fix my boat in my........08
spare time.  ..........................02
                          Word total = 45
```

Using the total-words scoring formula, this sample is found to contain 45 words (including misspellings).

2. Total letters--The examiner counts up the total number of letters written during the 3-minute probe. Again, misspelled words are included in the count, but numbers written in numeral form are excluded. Calculating total letters is a reasonably quick operation. When compared to word-total, it also enjoys the advantage of controlling for words of varying length. For example, a student who writes few words but whose written vocabulary tends toward longer words may receive a relatively low score on word-total but receive a substantially higher score

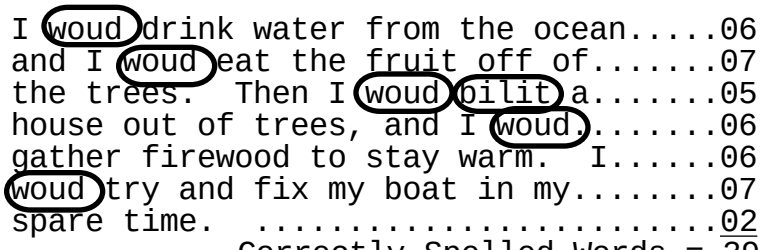
Fig. 2.11: CBM writing sample scored for total letters

```
I woud drink water from the ocean.....27
and I woud eat the fruit off of.......24
the trees.  Then I woud bilit a.......23
house out of trees, and I woud........23
gather firewood to stay warm.  I......25
woud try and fix my boat in my........23
spare time.  ..........................09
                       Letter total = 154
```

for letter-total . As with word-total, though, the letter-total formula gives only a general idea of writing fluency without examining a student's mastery of writing conventions. When scored according to total letters written, our writing sample is found to contain 154 letters.

3. Correctly Spelled Words--The examiner counts up only those words in the writing sample that are spelled correctly. Words are considered separately, not within the context of a sentence. When scoring a word according to this approach, a

Fig. 2.12: CBM Writing sample scored for correctly spelled words

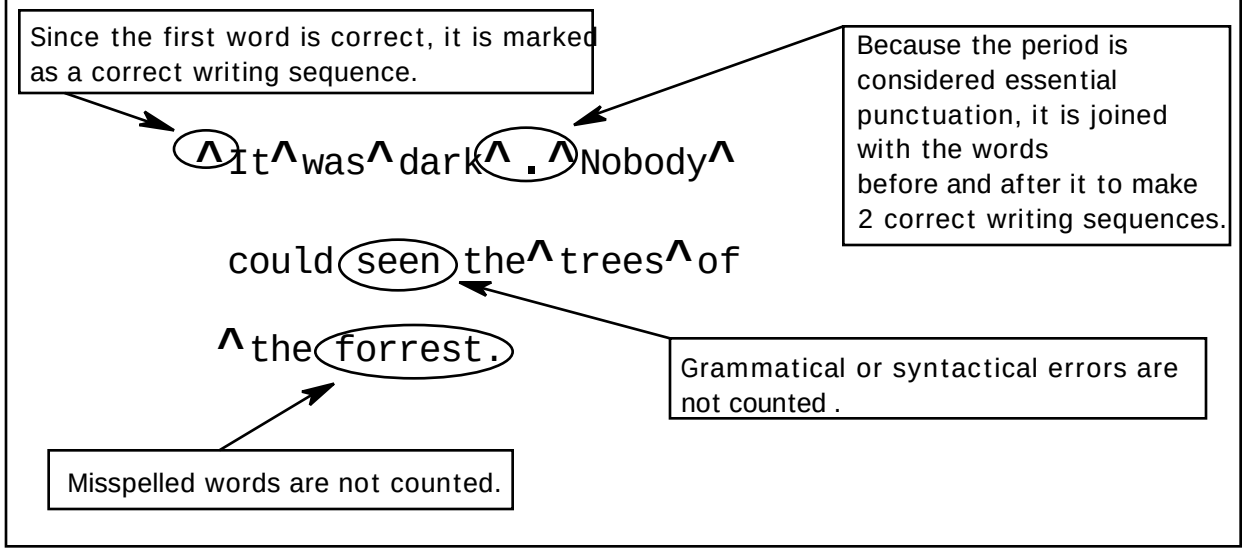


good rule of thumb is to determine whether--in isolation--the word represents a correctly spelled term in English. If it does, the word is included in the tally. Assessing the number of correctly spelled words has the advantage of being quick. Also, by examining the accuracy of the student's spelling, this approach monitors to some degree a student's mastery of written language. Our writing sample is found to contain 39 correctly spelled words.

4. Correct Writing Sequences--When scoring correct writing sequences, the examiner goes beyond the confines of the isolated word to consider units of writing and their relation to one another. Using this approach, the examiner starts at the beginning of the writing sample and looks at each successive pair of writing units (writing sequence). Words are considered separate writing units, as are essential marks of punctuation. To receive credit, writing sequences must be correctly spelled and be grammatically correct. The words in each writing sequence must also make sense within the context of the sentence. In effect, the student's writing is judged according to the standards of informal standard American English. A caret (^) is

used to mark the presence of a correct writing sequence.

Fig. 2.13: An illustration of selected scoring rules for correct writing sequences.



The following scoring rules will aid the instructor in determining correct writing sequences:

- Correctly spelled words make up a correct writing sequence (reversed letters are acceptable, so long as they do not lead to a misspelling):

  Example
  ^Is^that^a^red^car^?

- Necessary marks of punctuation (excluding commas) are included in correct writing sequences:

  Example
  ^Is^that^a^red^car^?

- Syntactically correct words make up a correct writing sequence:

  Example
  ^Is^that^a^red^car^?

  ^Is^that^a^car red?

➔ Semantically correct words make up a correct writing sequence:

Example

^Is^that^a^red^car^?

^Is^that^a read car^?

➔ If correct, the initial word of a writing sample is counted as a correct writing sequence:

Example

^Is^that^a^red^car^?

➔ Titles are included in the correct writing sequence count:

Example

^The^Terrible^Day

➔ With the exception of dates, numbers written in numeral form are not included in the correct writing sequence count:

Example

^The 14 soldiers^waited^in^the^cold^.

^The^crash^occurred^in^1976^.

Not surprisingly, evaluating a writing probe according to correct writing sequences is the most time-consuming of the scoring methods presented here. It is also the scoring approach, however, that yields the most comprehensive

information about a student's writing competencies. While further research is

Fig. 2.14: CBM Writing sample scored for correct writing sequence (Each correct writing sequence is marked with a caret (^)):

^I woud drink^water^from^the^ocean...05

^and^I woud eat^the^fruit^off^of.... 06

^the^trees^. ^Then^I woud bilit a....05

^house^out^of^trees,^and^I woud 06

gather^firewood^to^stay^warm^.^I.... 06

woud try^and^fix^my^boat^in^my 06

^spare^time^. 03

Correct Word Sequences = 37

needed to clarify the point, it also seems plausible that the correct writing sequence method is most sensitive to short-term student improvements in writing. Presumably, advances in writing skills in virtually any area (e.g., spelling, punctuation) could quickly register as higher writing sequence scores. Our writing sample is found to contain 37 correct writing sequences.

A Framework for Developing Special Education 'Eligibility Decision Rules' Under RTI

Using Response to Intervention to Determine Special Education Eligibility: Laying the Foundation

As school districts grow their capacity to provide RTI support to struggling students, they must also develop the decision rules required to determine when students who fail to respond to general-education interventions may need special education support. While existing research gives us only a partial roadmap for what the process will look like for diagnosing Learning Disabilities under RTI, there are sufficient guideposts in place to allow districts to get started immediately in developing their own capacity to use RTI information at special education eligibility meetings. Listed below are factors for districts to consider:

Section 1: Building the Foundation. Before an effective set of decision rules can be developed to determine student eligibility for special education, the school must first put into place these foundation components and procedures.

- Ensure Tier 1 (Classroom) Capacity to Carry Out Quality Interventions. The classroom teacher is the 'first responder' available to address emerging student academic concerns. Therefore, general-education teachers should have the capacity to define student academic concerns in specific terms, independently choose and carry out appropriate evidence-based Tier 1 (classroom) interventions, and document student response to those interventions. (NOTE: See attached form *Tier 1 (Classroom) Interventions: Building Your School's Capacity* for an 8-step process to promote teacher intervention skills.)

- Collect Benchmarking/Universal Screening Data on Key Reading and Math (and Perhaps Other) Academic Skills for Each Grade Level. Benchmarking data is collected on all students at least three times per year (fall, winter, spring). Measures selected for benchmarking should track student fluency and accuracy in basic academic skills that are key to success at each grade level.

- Hold 'Data Meetings' With Each Grade Level. After each benchmarking period (fall, winter, spring), the school organizes data meetings by grade level. The building administrator, classroom teachers, and perhaps other staff (e.g., reading specialist, school psychologist) meet to:
    - review student benchmark data.
    - discuss how classroom (Tier 1) instruction should be changed to accommodate the student needs revealed in the benchmarking data.
    - select students for Tier 2 (supplemental group) instruction/intervention.

Section 2: Creating Special Education Eligibility Decision Rules. Fuchs (2003) has formulated the 'dual discrepancy model', an influential conceptual framework for defining Learning Disabilities under RTI. According to this model, a student qualifies as LD only if (A) there is a significant academic skill gap o between the target student and typical peers (discrepancy 1), and (B) the target student fails to make adequate progress to close the skill gap despite appropriate interventions (discrepancy 2). In line with RTI logic, then, the school makes the initial assumption

that students with emerging academic concerns have typical abilities and simply require the 'right' instructional strategies to be successful. Your district must develop decision rules that allow you to evaluate data collected during successive intervention trials to identify with confidence those students who are 'non-responders' to Tier 2 and Tier 3 interventions and may require special education services.

- **Establish the Minimum Number of Intervention Trials Required Prior to a Special Education Referral.** Your district should require a sufficient number of intervention trials to definitively rule out instructional variables as possible reasons for student academic delays. Many districts require that at least three Tier 2 (small-group supplemental) and/or Tier 3 (intensive, highly individualized) intervention trials be attempted before moving forward with a special education evaluation.

- **Determine the Minimum Timespan for Each Tier 2 or Tier 3 Intervention Trial.** An intervention trial should last long enough to show definitively whether it was effective. One expert recommendation (Burns & Gibbons, 2008) is that each academic intervention trial should last at least 8 instructional weeks to allow enough time for the school to collect sufficient data to generate a reliable trend line.

- **Define the Level of Student Academic Delay That Will Qualify as a Significant Skill Discrepancy.** Not all students with academic delays require special education services; those with more modest deficits may benefit from general-education supplemental interventions alone. Your district should develop guidelines for determining whether a student's academic skills should be judge as significantly delayed when compared to those of peers:

    - If using local Curriculum-Based Measurement norms, set an appropriate 'cutpoint' score (e.g., at the 10th percentile). Any student performing below that cutpoint would be identified as having a significant gap in skills.
    - If using reliable national or research norms (e.g., reading fluency norms from Hasbrouck & Tindal, 2004), set an appropriate 'cutpoint' score (e.g., at the 10th percentile). Any student performing below that cutpoint would be identified as having a significant gap in skills.

- **Define the Rate of Student Progress That Will Qualify as a Significant Discrepancy in Rate of Learning.** The question of whether a student has made adequate progress when on intervention is complex. While each student case must be considered on its own merits, however, your district can bring consistency to the process of judging the efficacy of interventions by discussing the factors below and ensuring to the maximum degree possible that your district adopts uniform expectations:

    1. *Define 'grade level performance'*. The goal of academic intervention is to bring student skills to grade level. However, your district may want to specify what is meant by 'grade level' performance. Local CBM norms or reliable national or research norms can be helpful here. The district can set a cutpoint that sets a minimum threshold for 'typical student performance' (e.g., 25th percentile or above on local or research norms). Students

whose performance is above the cutpoint would fall within the 'reachable, teachable range' and could be adequately instructed by the classroom teacher.

2. *Set ambitious but realistic goals for student improvement.* When an intervention plan is put into place, the school should predict a rate of student academic improvement that is ambitious but realistic (Hosp, Hosp, and Howell, 2007). During a typical intervention series, a student usually works toward intermediate goals for improvement, and an intermediate goal is reset at a higher level each time that the student attains it. The ultimate goal, of course, is to move the student up to grade-level performance (defined above). The school should be able to supply a rationale for how it set goals for rate of student improvement. For example, a school may use research guidelines in oral reading fluency growth (Fuchs, Fuchs, Hamlett, Walz, & Germann, 1993) to set a goal. Or the school may use local norms to compute a weekly goal for improvement by (1) calculating the amount of progress that the student needs to close to reach grade-level performance and (2) dividing that figure by the number of weeks available for intervention.

3. *Decide on a reasonable time horizon to 'catch' the student up with his or her peers*. Interventions for students with serious academic delays cannot be successfully completed overnight. It is equally true, though, that interventions cannot stretch on without end if the student fails to make adequate progress. Your district should decide on a reasonable span of time in which a student on intervention should be expected to close the gap and reach grade level performance (e.g., 12 months). Failure to close that gap within the expected timespan may be partial evidence that the student requires special education support.

4. *View student progress-monitoring data in relation to peer norms.* When viewed in isolation, student progress-monitoring data tells only part of the story. Even if students shows modest progress, they may still be falling farther and farther behind their peers in the academic skill of concern. Your district should evaluate student progress relative to peers. If the skill gap between the student and their peers (as determined through repeated school-wide benchmarking) continues to widen, despite the school's most intensive intervention efforts, this may be partial evidence that the student requires special education support.

5. *Set uniform expectations for how progress-monitoring data are presented at special education eligibility meetings*. Your district should adopt guidelines for schools in collecting and presenting student progress-monitoring information at special education eligibility meetings. For example, it is recommended that curriculum-based measurement or similar data be presented as time-series charts. These charts should include trend lines to summarize visually the student's rate of academic growth, as well as a 'goal line' indicating the intermediate or final performance goal toward which the student is working.

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