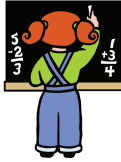


Identifying Students with Elementary Mathematics Difficulties



Brian R. Bryant, Ph.D.
Diane Pedrotty Bryant, Ph.D.
The University of Texas @ Austin

In this session, participants will learn about progress monitoring measures that can be implemented as part of a RtI 3-Tier Math Model. Examples of measures will be presented.

What is the purpose of this presentation?

1. Describe assessment issues
2. Describe assessment measures
3. Colorado Early Mathematics Inventories...



Issues involved with assessments...



or

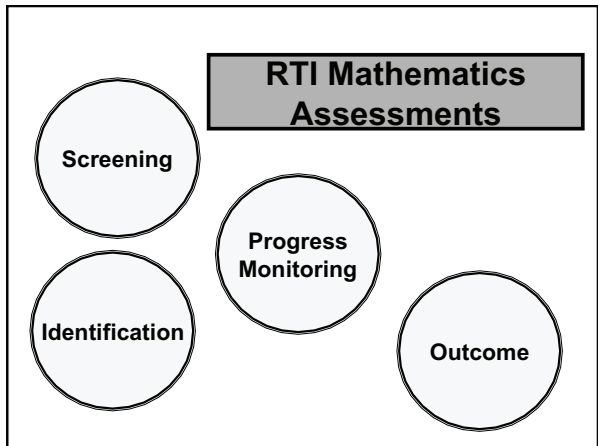
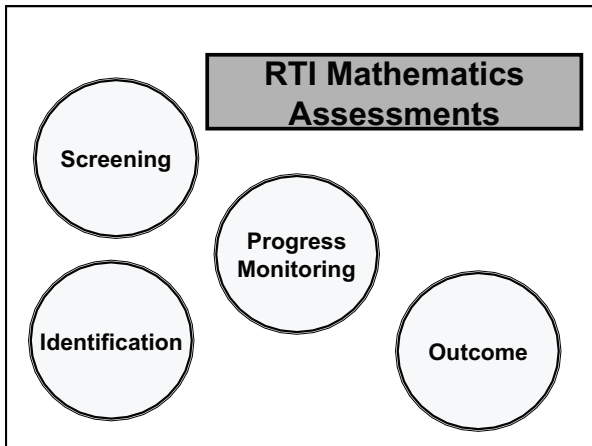
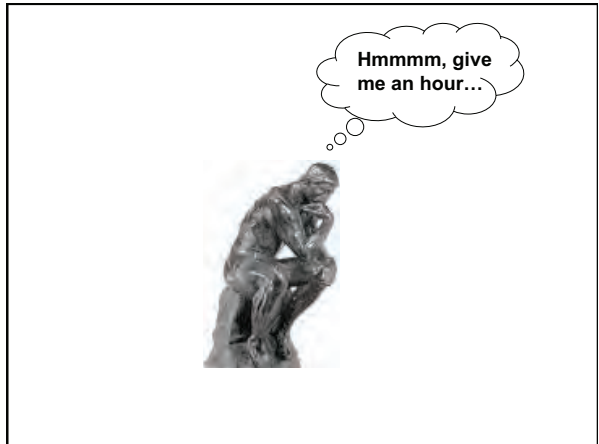
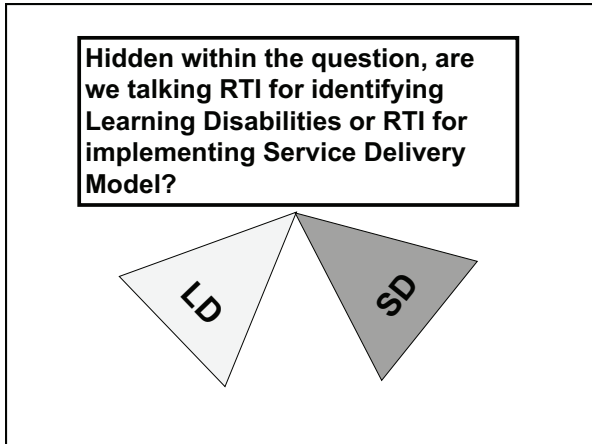


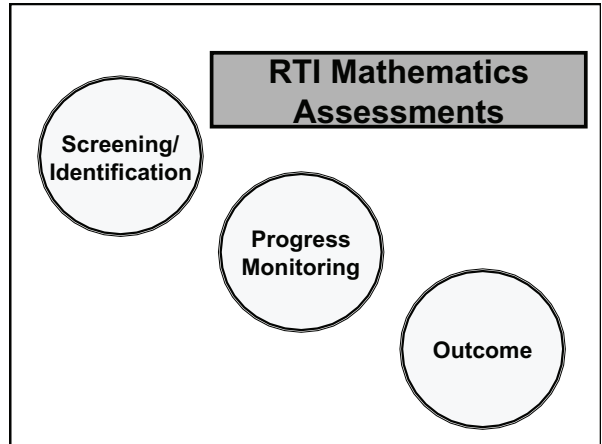
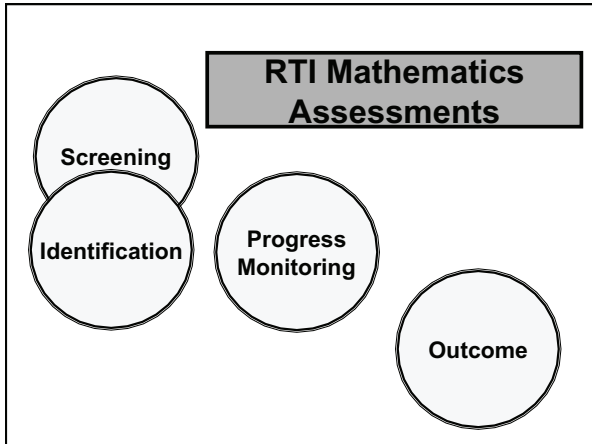
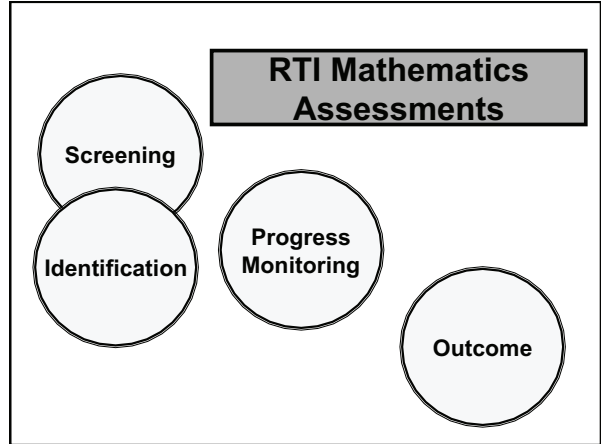
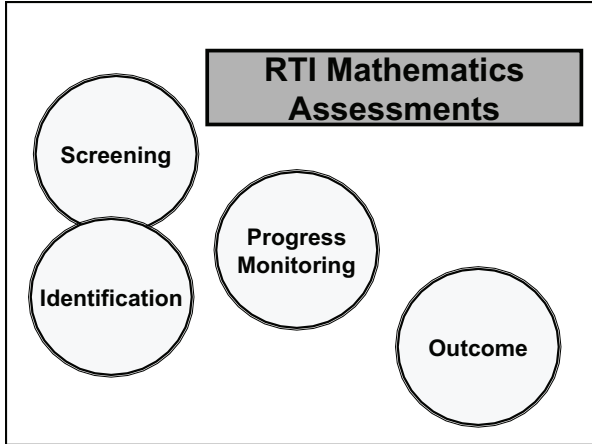
TEKS/TAKS



CSAP

http://www.cde.state.co.us/cdeassess/documents/csap/released_items/2005_math_releaseditems.pdf



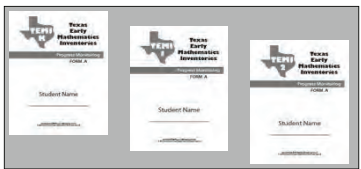


Screening/Identification


Fall and Winter: Identify Struggling Students

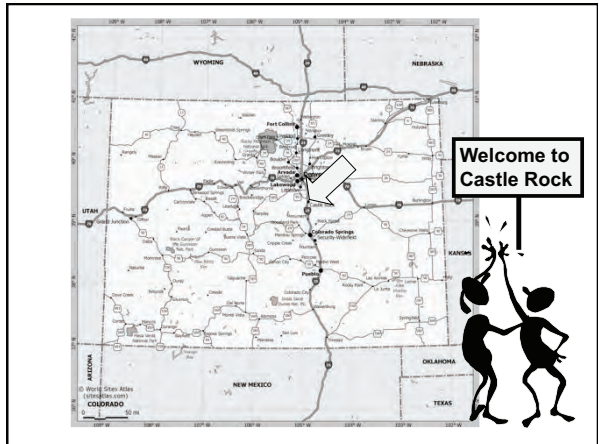
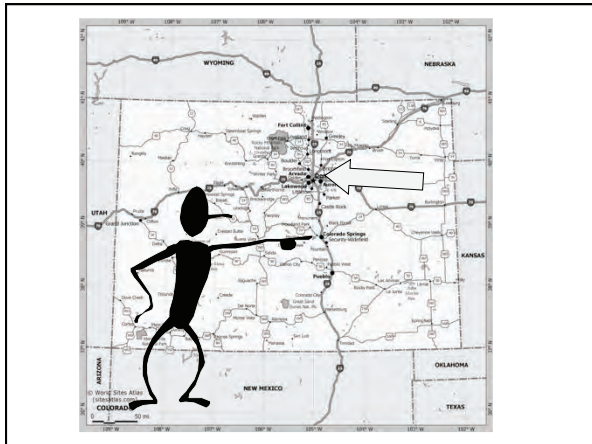
<25th %ile	25th through 99th %ile
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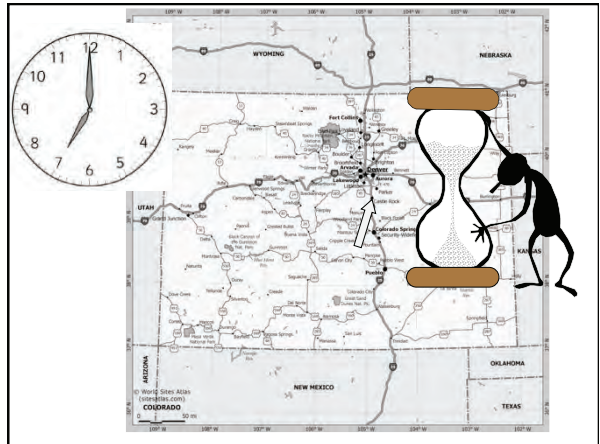
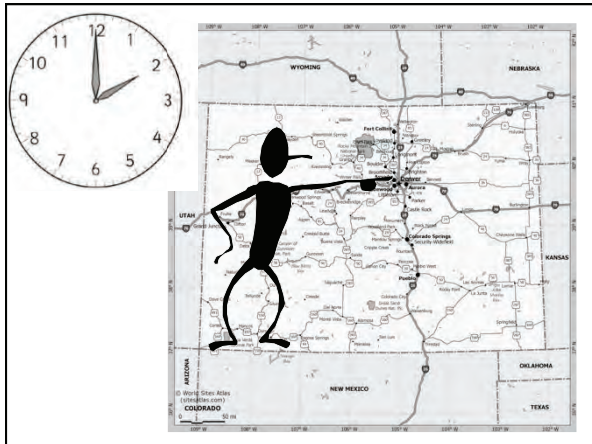
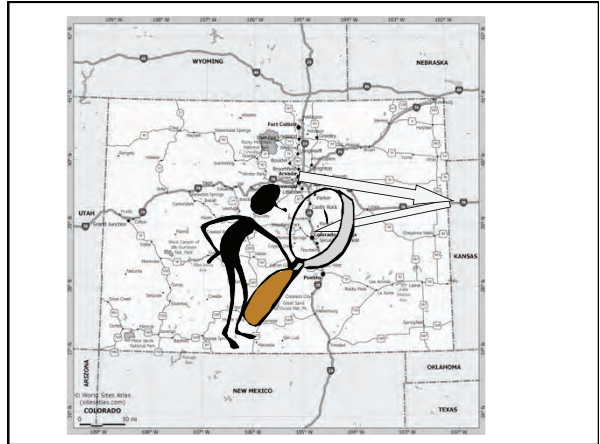
**Total Score = Sum of TEMI-PM raw scores;
compare to Benchmark**

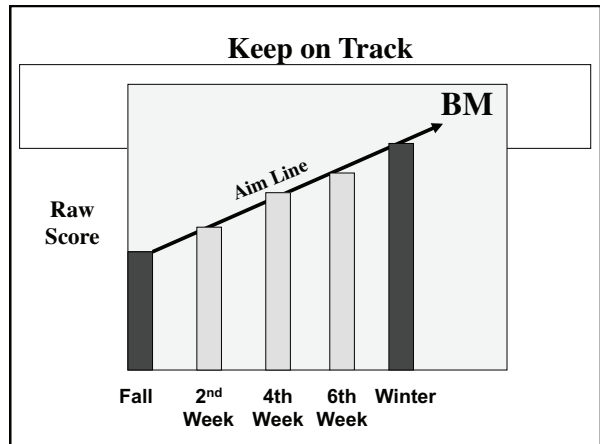
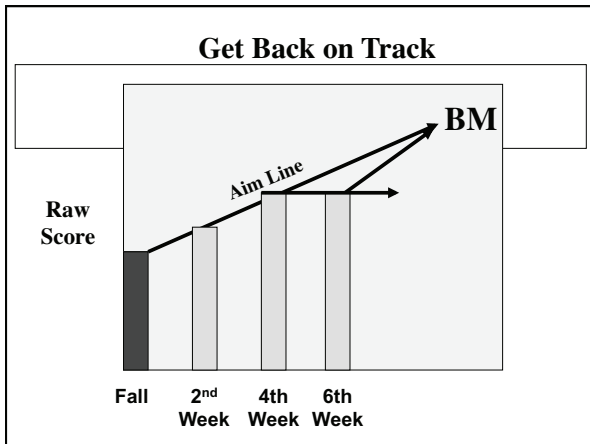
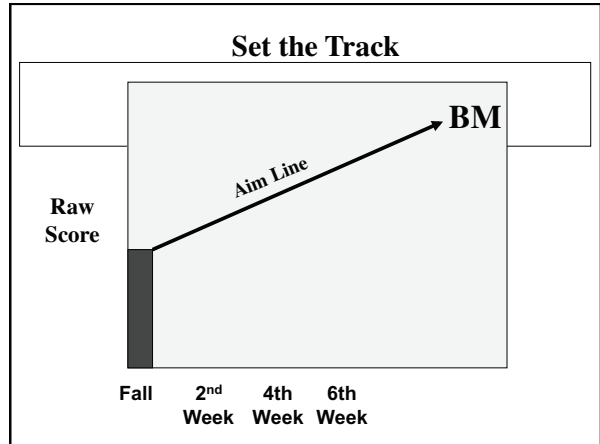
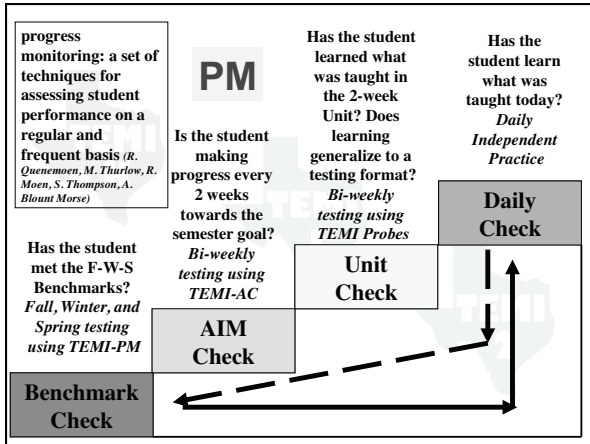


Fluency as Applied to Progress Monitoring: Measuring how we get from Point A to Point B Effectively and Efficiently

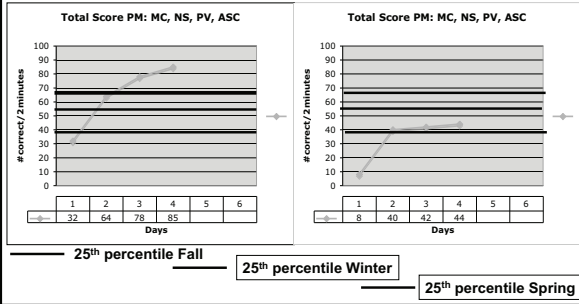

RATE + ACCURACY





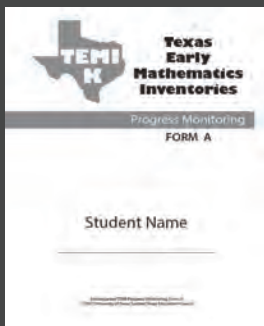
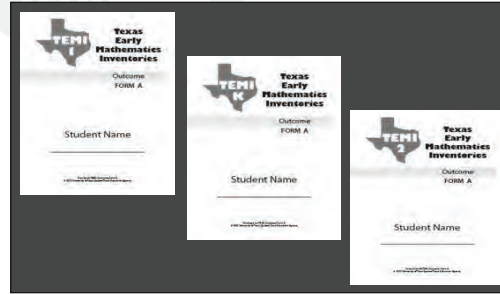


**Bi-Weekly Progress Monitoring:
1st Grade Group Example (fall, 2006)**



Outcome

Fall to Spring gains across the broad based TEKS.

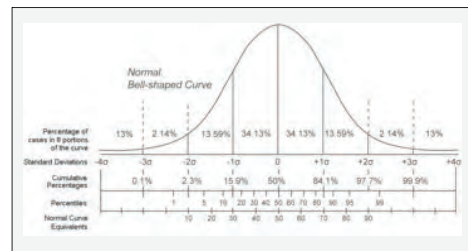


**Screening/
Identification**

and

**Progress
Monitoring**

Assessment Measures



TEMI-PM Description

Four TEMI-PM tests are administered at each grade.

Magnitude Comparisons:	Grades K, 1, 2
Number Sequences:	Grades K, 1, 2
Number Identification:	Grade K only
Quantity Recognition:	Grade K only
Place Value:	Grades 1, 2 only
Addition/Subtraction Combinations:	Grades 1, 2 only

TEMI-PM Test Description

All TEMI-PM tests are fluency measures. Students are given 2 minutes to do as many items as they can.



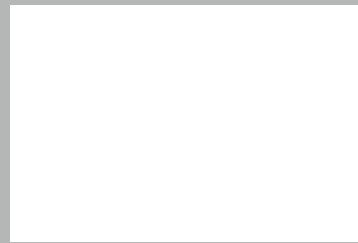
TEMI-PM tests are group administered and designed to assess fundamental number skills (Kindergarten) and number and operation skills (Grades 1 and 2) that are critical to the acquisition of more broad-based math skills.

Magnitude Comparisons (Grades K, 1, and 2)

Two numbers appear side by side.

For Kindergarten, students circle the bigger number, or both numbers if they are the same. Numbers range from 0 to 20.

Magnitude Comparisons (Grade K)

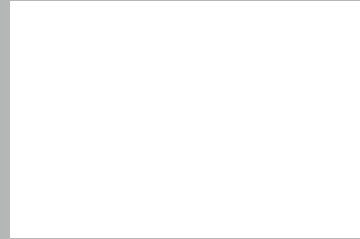


Magnitude Comparisons (Grades K, 1, and 2)

Two numbers appear side by side.

First graders circle the smaller number, or both numbers if they are the same, or equal. Numbers range from 0 to 99.

Magnitude Comparisons (Grade 1)

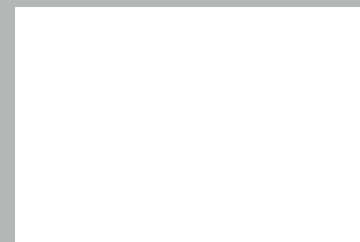


Magnitude Comparisons (Grades K, 1, and 2)

Two numbers appear side by side.

Students in second grade are told to circle the number that is less, or both numbers if they are equal. Numbers range from 0 to 999.

Magnitude Comparisons (Grade 2)

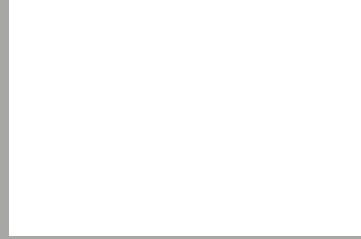


Number Sequences (Grades K, 1, and 2)

Three numbers appear in sequence, but one number is represented by a blank. Blanks can appear at the beginning, middle, or end of the sequence.

For Kindergarten, numbers range from 0 to 20; students circle the missing number from among four response choices.

Number Sequences (Grade K)

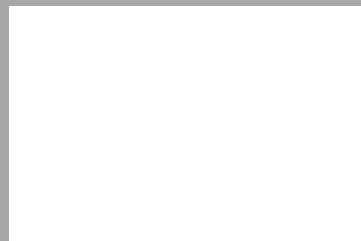


Number Sequences (Grades K, 1, and 2)

Three numbers appear in sequence, but one number is represented by a blank. Blanks can appear at the beginning, middle, or end of the sequence.

For first graders, numbers range from 0 to 99; students circle the missing number from among four response choices.

Number Sequences (Grade 1)

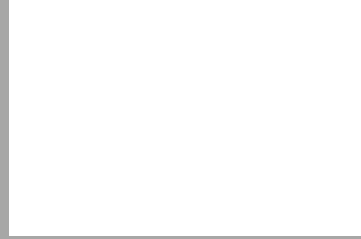


Number Sequences (Grades K, 1, and 2)

Three numbers appear in sequence, but one number is represented by a blank. Blanks can appear at the beginning, middle, or end of the sequence.

For second grade, numbers range from 0 to 999; students write the missing number in the blank.

Number Sequences (Grade 2)

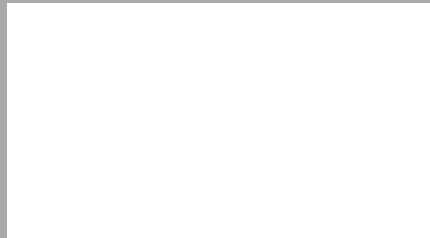


Number Identification (Grade K only)

Shapes appear in a box, with four response choices to the right. Numbers range from 1 to 20.

Kindergarten students circle the number that shows how many there are in all.

Number Identification (Grade K only)

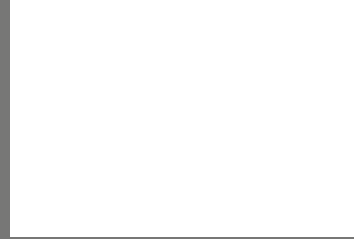


Quantity Recognition (Grade K only)

From one to six dots appear in a cluster within a box. Six response choices appear below the cluster.

Kindergarten students circle the number that shows how many there are in all.

Quantity Recognition (Grade K only)

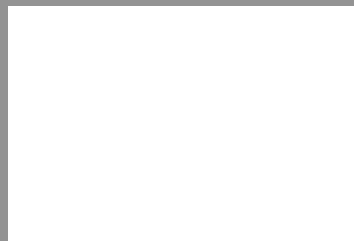


Place Value (Grades 1 and 2 only)

For first grade, stacks of tens and ones are shown, along with four response choices. Numbers range from 1 to 99.

First grade students circle the number that shows how many there are in all.

Place Value (Grade 1)

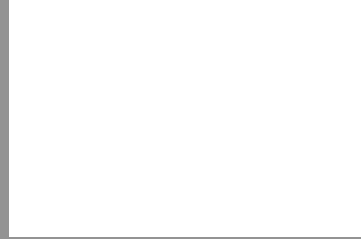


**Place Value
(Grade 2)**

For second grade, stacks of hundreds, tens, and ones are shown. Numbers range from 1 to 999.

Second grade students write the number (in the space provided) that shows how many there are in all.

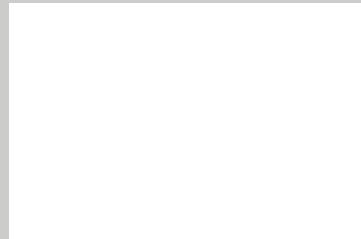
**Place Value
(Grade 2)**



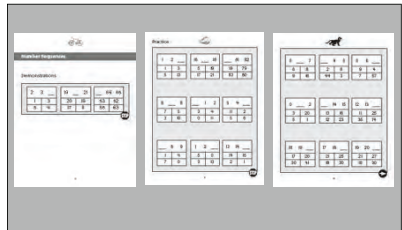
**Addition/Subtraction
Combinations
(Grades 1 and 2 only)**

Students in Grades 1 and 2 look at addition and subtraction problems on a page. They then compute and write the answer to each problem.

**Addition/Subtraction
Combinations
(Grades 1 and 2 only)**



Note



All TEMI-PM tests have three sections.

1. Demonstrations
2. Practice
3. Test items

Demonstration items are designed to introduce the test and show students how they are to mark their answers. The examiner models how to respond to test items.

Practice items are designed to give students an opportunity to mark their answers and get a sense of time limits. Students are given 30 seconds to respond to one page of items. It is important for students to do the practice items to make sure that students know how to mark their answers in a timed condition.

Test items are presented across several pages; and students are given 2 minutes to respond to as many items as they can. It is extremely rare for students to complete all items in the 2-minute span, especially in the fall.

Using Grade 1 Number Sequences as an example...

Number Sequences

Demons-trations

2 3	19	54	55
1 3	20	53	52
5 4	17	55	63

Practice

1 2	16	81	82
1 3	5 19	19	79
5 13	17	83	80

Notice the page markers.

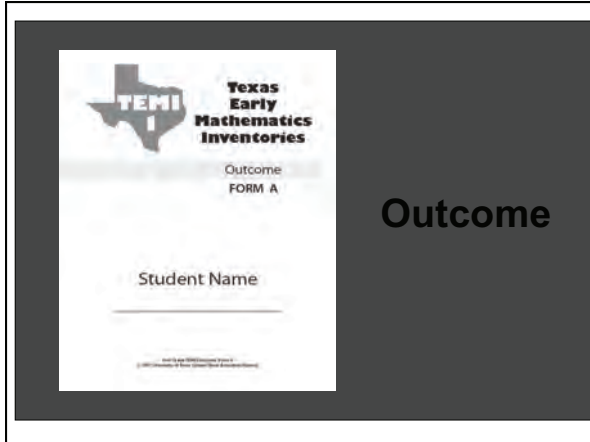
Notice the "STOP" signs.

Notice the page marker.

5	7	4	5	5	6
6	8	2	6	9	4
9	16	44	3	7	57

14	16	12	13	24	25
17	15	10	14	22	26
35	47	11	15	14	23

Notice the "CONTINUE" arrows.



TEMI-O Test Description

For Kindergarten, the TEMI-O consists of a Mathematics Problem Solving test.

For students in Grades 1 and 2, the TEMI-O consists of a Mathematics Problem Solving test and a Computation test.

The TEMI-O Mathematics Problem Solving test is designed to assess the broad-based mathematics TEKS. Items assess number, operation, and quantitative reasoning; patterns, relationships, and algebraic thinking; measurement; probability and statistics; and so forth.

The TEMI-O Computation test is designed to assess students' ability to calculate solutions to addition and subtraction problems in Grade 1 and addition, subtraction, multiplication, and division problems in Grade 2.

Unlike the TEMI-PM, the TEMI-O is NOT a fluency measure. For the MPS, examiners read aloud each test item, and students are given about 10 seconds to mark their answer.

For some items (marked with an asterisk in the instructions), students are given about 25 to 30 seconds to respond.


For the Computation test, students are given about 20 minutes to solve the problems.

For the Kindergarten Mathematics Problem Solving test, students select their answer from among three response choices.

**TEMI-O/MPS
(Grade K)**

For the Grades 1 and 2 test, students select their answer from among FOUR response choices. The final choice is always NS, which stands for Not Shown.

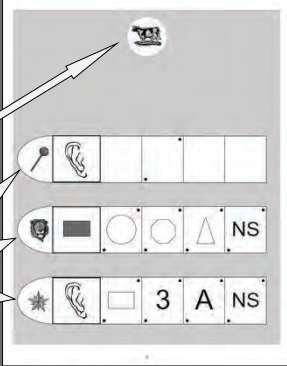
TEMI-O/MPS (Grades 1 and 2)



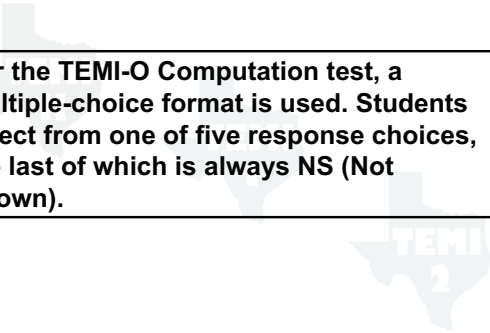
Practice Items:
Students are shown how to mark their answers by connecting two dots.

Notice the page marker.


Notice the item markers.



For the TEMI-O Computation test, a multiple-choice format is used. Students select from one of five response choices, the last of which is always NS (Not Shown).

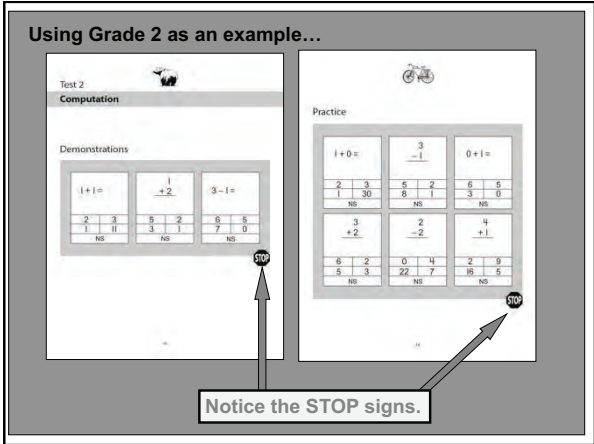


TEMI-O/MC (Grades 1 and 2)



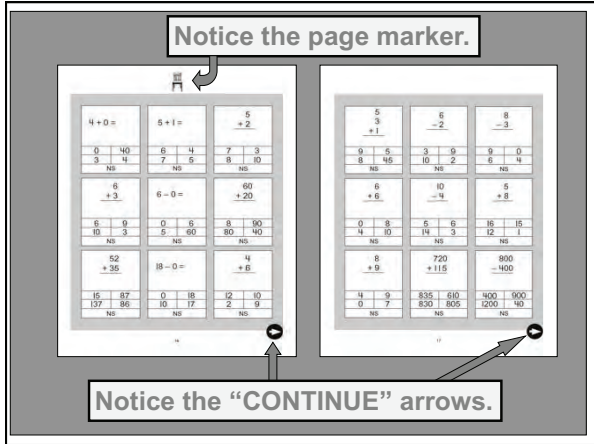
Like the TEMI-PM tests, the TEMI-O Computation test has Demonstrations, Practice, and Test items sections.

Using Grade 2 as an example...



Notice the STOP signs.

Notice the page marker.



Notice the "CONTINUE" arrows.


Unlike the TEMI-PM Addition/Subtraction test, the TEMI-O Computation test is NOT a fluency measure. Examiners read aloud the instructions to the student at the beginning of testing, and students are given about 20 minutes to compute and answer the items (students in Grade 2 may take longer because there are more items).

If students complete testing early, examiners should check their work to make sure they did not accidentally skip pages. Students who complete testing early can read a book or do other seatwork that is not disruptive to students who are still testing.

Something's missing...




...Classroom teacher input. Research indicates that teacher ratings correlate with achievement measures to much the same extent as achievement tests correlate with one another.




Academic and Behavior Compendium*.

Main Entry: com-pen-di-um
 Pronunciation: k&m-'pen-dE-&m
 Function: *noun*
 Inflected Form(s): *plural -di-ums or com-pen-dia /-dE- &/*
 Etymology: Medieval Latin, from Latin, saving, shortcut, from *compendere* to weigh together, from *com-* + *pendere* to weigh -- more at PENDANT
 1 : a brief summary of a larger work or of a field of knowledge : ABSTRACT
 2 a : a list of a number of items b : COLLECTION, COMPILATION





Step 1. Conduct Fall Testing – Benchmark Checks

Administer the TEMI-PM and TEMI-O (Form A)
Identify students who qualify for Tier 2 and Tier 3 intervention




Step 2. Intervene (continuous)

Target areas of need
Conduct Booster Sessions
Implement Peas Make Great ICE Packs
Conduct Fidelity Checks




Step 3. Conduct Activity Level Testing with Daily Checks


Determine whether the student learned the objective
Apply the *ADAPT Framework**



Step 4. Conduct Bi-weekly Testing with Unit Checks

Has the student maintained learning?
Can the student generalize knowledge to a testing format?






Step 5. Conduct Bi-weekly Testing with Aim Checks


Chart progress
Is the student making gains toward yearly goal?

Step 6. Conduct Winter/Spring Testing with Benchmark Checks

Can the student EXIT the program?
Do other students enter the program?
LD Identification?



Colorado Early Mathematics Inventories?????



Paraphrasing Randy Kamphaus: "Don't do it!!!"

Establish Content Validity
Select items representative of state standards (state adopted basals are helpful).
Have experts verify that items relate to standards
Field test and conduct item analyses

Establish Criterion-related Validity
Administer the test and correlate results with established measures and teacher ratings
Conduct analyses to demonstrate that the test is predictive of future performance

Establish Construct Validity
Generate relative questions and test hypotheses (age related, floor/ceiling effects, relate to other areas of achievement, differentiates among groups, shows intervention-related gains throughout the year)

Demonstrate Reliability – Internal Consistency, alternate forms, test-retest, inter-scorer

Establish normative data – at least 100 kids at each age, 1000 overall, representative of the state/district

Who is then identified as qualifying for LD services?

That is up to you (LEA/SEA).

Questions to consider:

1. Does RTI make a valid contribution to LD ID?
2. Does the student have general learning disabilities or a specific learning disability?
3. Is it important to identify all areas of learning disabilities or just one? (e.g., Rdg. & Math? Wtg?)
4. Does the student remain a candidate after exclusionary criteria have been applied?
5. Is IQ to be a determining factor in the identification of a specific learning disability? (IQ=65, non-MR)
6. Does a student with a learning disability have to be a Tier 3 student? (Revolving Door Students)