



CENTER ON  
INSTRUCTION

# **Progress Monitoring for Elementary Mathematics**

Pamela M. Stecker  
Clemson University

*Presented at the Center on Instruction  
Mathematics Summit  
November 13, 2006*



## CENTER ON INSTRUCTION

The Center on Instruction is operated by RMC Research Corporation in partnership with the Florida Center for Reading Research at Florida State University; RG Research Group; the Texas Institute for Measurement, Evaluation, and Statistics at the University of Houston; and the Vaughn Gross Center for Reading and Language Arts at the University of Texas at Austin.

The contents of this PowerPoint were developed under cooperative agreement S283B050034 with the U.S. Department of Education. However, these contents do not necessarily represent the policy of the Department of Education, and you should not assume endorsement by the Federal Government.

2006

**The Center on Instruction requests that no changes be made to the content or appearance of this product.**

***To download a copy of this document, visit [www.centeroninstruction.org](http://www.centeroninstruction.org)***

# **Progress Monitoring for Elementary Mathematics**

Pamela M. Stecker, PhD

Clemson University

Presented at the Center on Instruction Meeting:

Mathematics Strand

Annapolis, Maryland

November 13, 2006

# **Progress Monitoring in Mathematics**

Center on Instruction  
Mathematics Strand

# Overview of the Presentation

- Describe progress monitoring
- Explain common techniques that are often mistaken for progress monitoring
- Discuss features of progress monitoring in elementary grades
- Review brief history of progress monitoring measures in mathematics
- Provide overview of commonly used computer and Web-based progress monitoring systems

# **General Definition of Student Progress Monitoring**

- The process of collecting and evaluating data to make decisions about the adequacy of student progress toward a goal
- Evaluation of student rate of change (slope) as compared to the slope of anticipated progress

# General Definition of Student Progress Monitoring

- Requires:
  - Technically sound measures
  - Multiple forms of the same measure
  - Assessment systems that are sensitive to student growth
  - Standardized administration procedures
  - Frequent measurement (occurs at least monthly)

# Display of Progress Monitoring Data





**Common Assessment  
Approaches  
That ARE NOT  
Progress Monitoring**

# **Common Assessment Approaches That Are Not Progress Monitoring**

- Curriculum-Embedded Assessment
- Benchmarking

# Curriculum-Embedded Assessment

- Helps teachers identify whether students learned a particular concept/skill or what was taught in the chapter or unit
- Tracks mastery of short-term instructional objectives
- Sampling of items is representative of a limited set of problems, concepts, or skills
- Assessment materials mirror instructional materials

# Teachers' Use of Curriculum-Embedded Assessments

- Teacher-created
  - Teacher develops assessments that focus on a particular concept or skill
  - Multiple forms are created
  - Teacher gives assessment until student has learned that skill or concept
  - Often used with students who are struggling with a particular concepts or skills

# Teachers' Use of Curriculum-Embedded Assessments

- Publisher-developed
  - Teacher gives chapter and unit exams included with the textbook series to evaluate students' learning
  - Typically used with the entire class

# An Example from an Elementary Tutoring Context

- Mr. Jones is tutoring a fourth grade student who struggles with math computation skills
- He examines the sequence of skills for fourth grade computation and develops a criterion-referenced test for each skill within the sequence

# **An Example from an Elementary Tutoring Context**

- He provides instruction and gives alternate forms of the criterion-referenced test until the skill is learned
- Then he moves to the next skill in the sequence

# Hypothetical Fourth-Grade Math Computation Curriculum

1. *Multidigit addition with regrouping*
2. Multidigit subtraction with regrouping
3. Multiplication facts, factors to 9
4. Multiply 2-digit numbers by a 1-digit number
5. Multiply 2-digit numbers by a 2-digit number
6. Division facts, divisors to 9
7. Divide 2-digit numbers by a 1-digit number
8. Divide 3-digit numbers by a 1-digit number
9. Add/subtract simple fractions, like denominators
10. Add/subtract whole number and mixed number

Adapted from NCSPM



# Multidigit Addition Test

Name: \_\_\_\_\_ Date \_\_\_\_\_

Adding

$$\begin{array}{r} 36521 \\ + 63758 \\ \hline \end{array}$$

$$\begin{array}{r} 53429 \\ + 63421 \\ \hline \end{array}$$

$$\begin{array}{r} 84525 \\ + 75632 \\ \hline \end{array}$$

$$\begin{array}{r} 67842 \\ + 53937 \\ \hline \end{array}$$

$$\begin{array}{r} 57321 \\ + 46391 \\ \hline \end{array}$$

$$\begin{array}{r} 56382 \\ + 94742 \\ \hline \end{array}$$

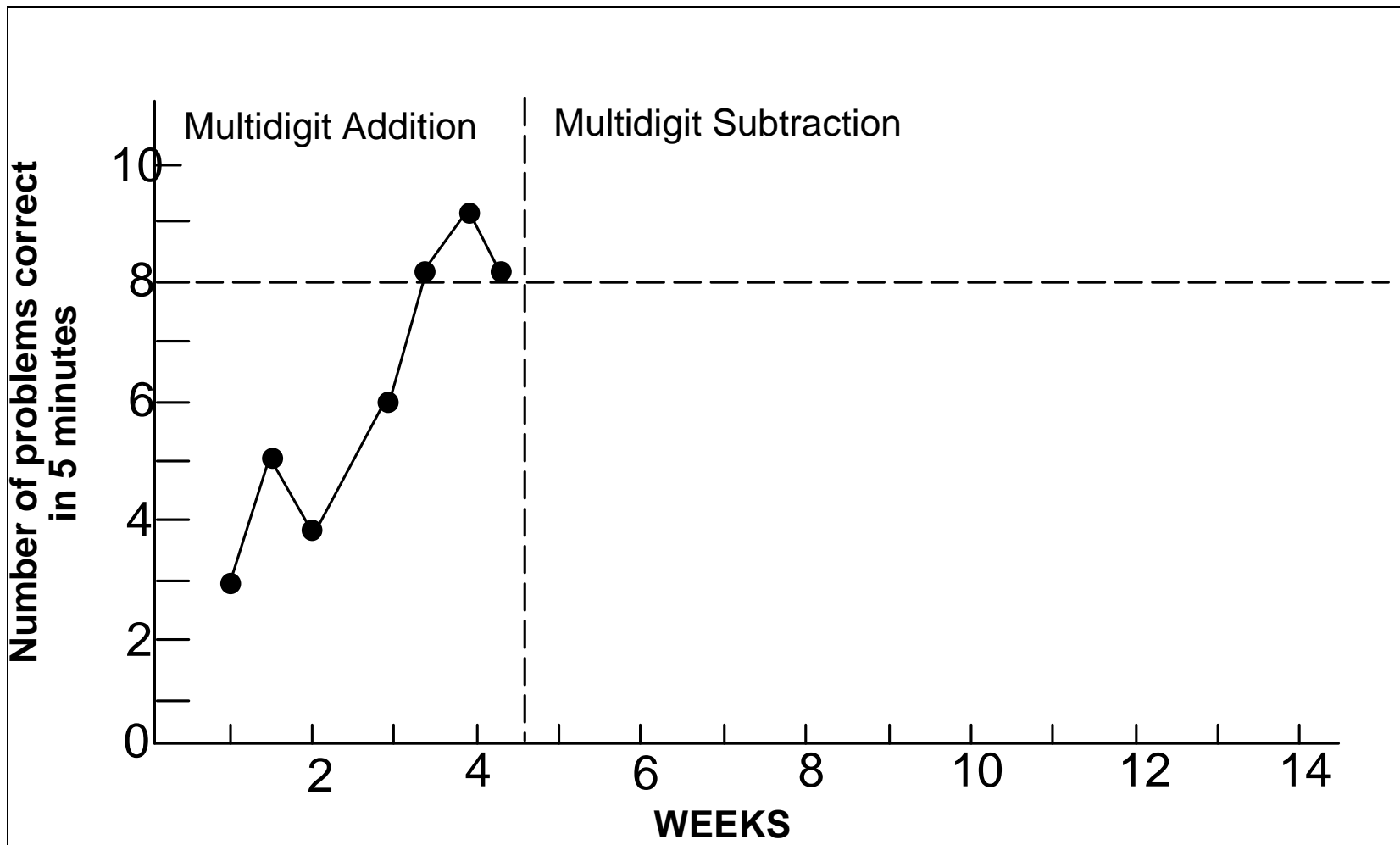
$$\begin{array}{r} 36422 \\ + 57529 \\ \hline \end{array}$$

$$\begin{array}{r} 34824 \\ + 69426 \\ \hline \end{array}$$

$$\begin{array}{r} 32415 \\ + 85439 \\ \hline \end{array}$$

$$\begin{array}{r} 45321 \\ + 86274 \\ \hline \end{array}$$

# Mastery of Multidigit Addition



Adapted from NCSPM

# Hypothetical Fourth-Grade Math Computation Curriculum

1. Multidigit addition with regrouping
2. *Multidigit subtraction with regrouping*
3. Multiplication facts, factors to 9
4. Multiply 2-digit numbers by a 1-digit number
5. Multiply 2-digit numbers by a 2-digit number
6. Division facts, divisors to 9
7. Divide 2-digit numbers by a 1-digit number
8. Divide 3-digit numbers by a 1-digit number
9. Add/subtract simple fractions, like denominators
10. Add/subtract whole number and mixed number

# Multidigit Subtraction Test

Name: \_\_\_\_\_ Date \_\_\_\_\_

Subtracting

$$\begin{array}{r} 6521 \\ - 375 \\ \hline \end{array}$$

$$\begin{array}{r} 5429 \\ - 634 \\ \hline \end{array}$$

$$\begin{array}{r} 8455 \\ - 756 \\ \hline \end{array}$$

$$\begin{array}{r} 6782 \\ - 937 \\ \hline \end{array}$$

$$\begin{array}{r} 7321 \\ - 391 \\ \hline \end{array}$$

$$\begin{array}{r} 5682 \\ - 942 \\ \hline \end{array}$$

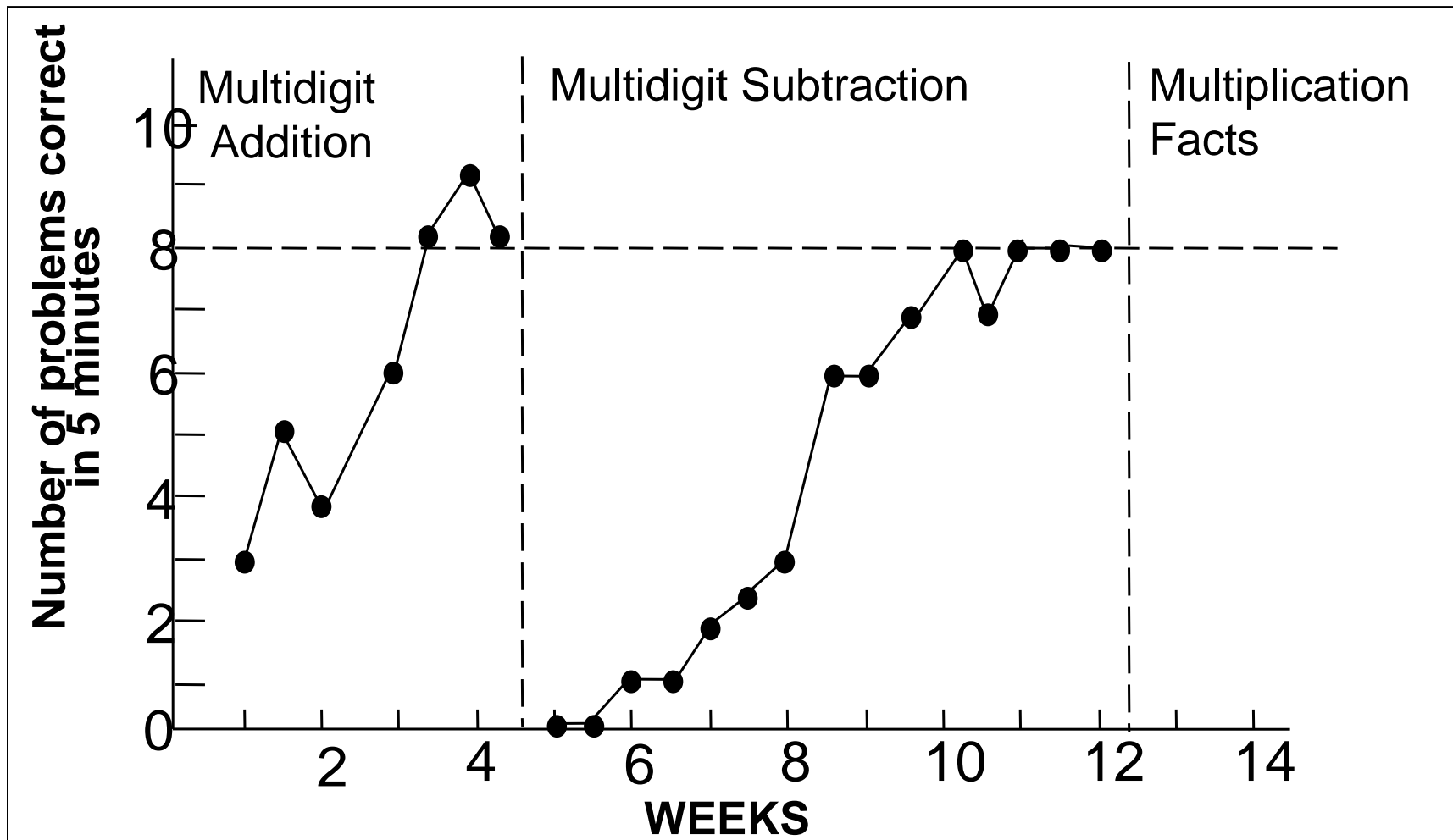
$$\begin{array}{r} 6422 \\ - 529 \\ \hline \end{array}$$

$$\begin{array}{r} 3484 \\ - 426 \\ \hline \end{array}$$

$$\begin{array}{r} 2415 \\ - 854 \\ \hline \end{array}$$

$$\begin{array}{r} 4321 \\ - 874 \\ \hline \end{array}$$

# Mastery of Multidigit Addition and Subtraction



Adapted from NCSPM

# Potential Difficulties with Curriculum-Embedded Assessment

- Sequence of concepts/skills or chapters is logical, not empirical.
- Difficulty of tasks may vary from test to test.
- Performance on limited-skill assessments can be misleading.

# Potential Difficulties with Curriculum-Embedded Assessment

- Assessments do not reflect maintenance or generalization of the concepts/skills.
- Assessments typically are designed by teachers or sold with textbooks with unknown reliability and validity.
- Number of concepts/skills or chapters passed does not relate well to performance on high-stakes tests.

# Benchmarking

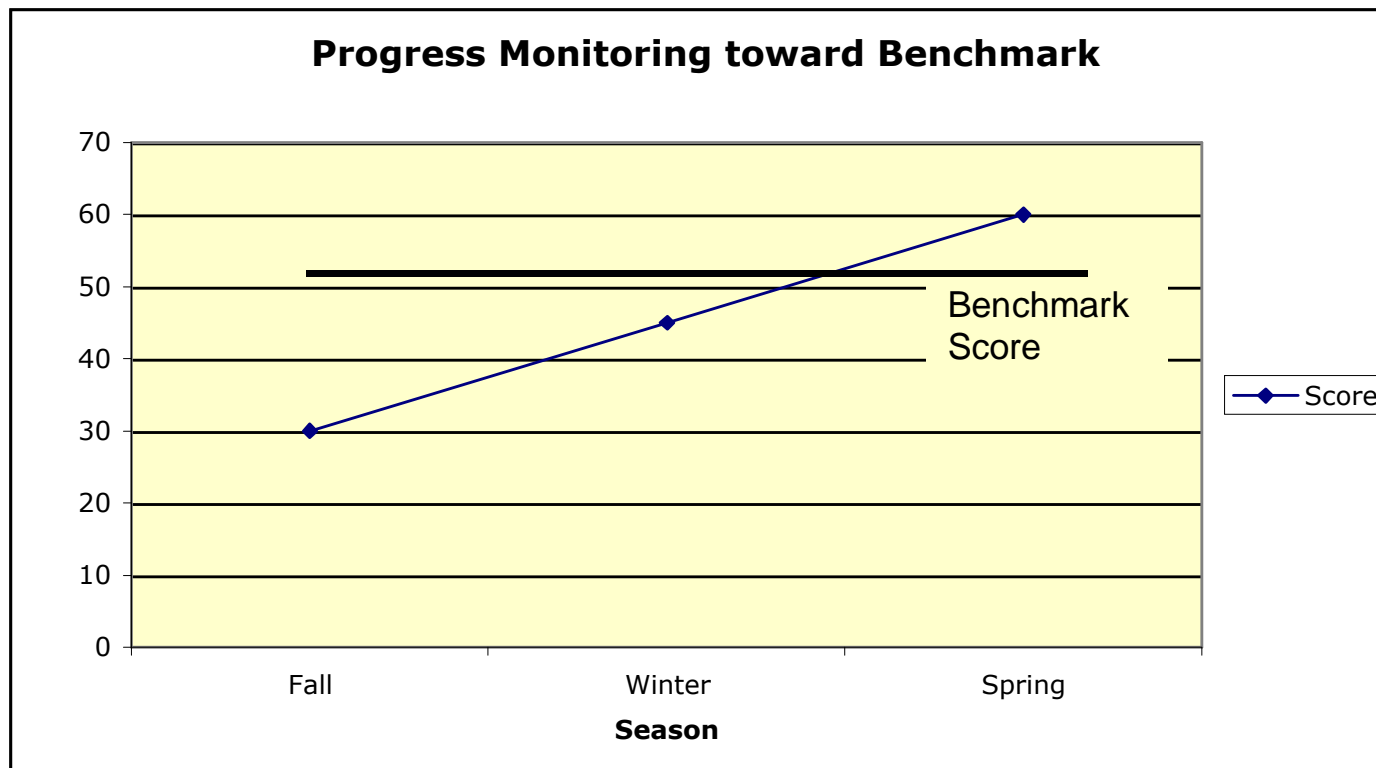
- The process of collecting and evaluating data to determine if students will meet terminal goal (often thought of as end-of-the-year performance goals)
- Benchmark goal is typically associated with proficiency on state standards in relation to AYP categories
- Uses:
  - Screening: Identify students who may be at risk for failure



# Features of Benchmarking

- Features of the Assessment System:
  - Aligned with the content and cognitive complexity of the benchmark goal (typically the state standards)
  - Samples a range of skills and knowledge in similar proportions as the benchmark goal OR is a valid predictor of benchmark goal
- Data are collected and evaluated typically three or four times per year
- All students are assessed

# Display of Benchmarking Data



# Potential Difficulties With Benchmarking

- Static performance of student at one point in time
- Comparison against a criterion
- Unable to use slope to determine whether student is progressing at a typical rate
- Unable to target student who may meet benchmark but may not be growing adequately

# **Specific Features of Mathematics Progress Monitoring**

# Progress Monitoring

- The process of collecting and evaluating data to determine whether students are making progress toward instructional goals and/or responding to instructional interventions

# Progress Monitoring

- Uses:
  - Estimate rates of student improvement
  - Describe student response to instructional program
  - Inform teachers' instructional decision making
  - Aid teachers in targeting areas/skills that need remediation
  - Help teachers build potentially more effective programs for particular students

# Research Supports the Use of Progress Monitoring

- Progress monitoring data produce accurate, meaningful information about students' academic levels and their rates of improvement
- Progress monitoring data are sensitive to student improvement

# Research Supports the Use of Progress Monitoring

- Performance on progress monitoring measures corresponds well to performance on high-stakes tests
- When teachers use progress monitoring data to inform their instructional decisions, students make greater learning gains



# Process of Progress Monitoring

- Progress monitoring is a data-based instructional decision making tool
- Steps for using data:
  - Gather baseline performance data
  - Set instructional goals
  - Provide targeted instruction
  - Monitor progress toward goal
  - Adjust goal upward or modify instruction as needed



# Features of Progress Monitoring Systems

- Data are collected and evaluated frequently
  - Schedule is determined by goal and current level of student performance
  - Typically ranges from 2 times per week to monthly

# Features of Progress Monitoring Systems

- Teachers may choose to monitor progress of all students in class
- Typically, students at-risk of failure are assessed until they reach proficiency
- Data-based decision rules are applied to graphed data to determine when goals should be raised or instruction should be modified

# Features of Progress Monitoring Measures

- Difficulty of tasks remains consistent across the year
- Allotted time typically does not allow for completion of test, so student growth still can be assessed

# Features of Progress Monitoring Measures

- Uses standardized administration and scoring
  - Test administration is timed (relatively short tests in duration)
  - Specific scoring rules are applied
  - Scoring typically uses counts, rather than percent correct

# Two Approaches to Developing Progress Monitoring Measures (Fuchs, 2004)

- Curriculum Sampling
  - Systematically sample items from the annual curriculum on each measure
- Robust Indicator
  - Identify a global behavior that either encompasses many skills taught in the annual curriculum or is predictive of proficiency in the annual curriculum

# Curriculum Sampling

- Each probe is a proportional sampling of the annual curriculum
- Advantages
  - May conduct skills analysis
  - May evaluate maintenance and generalization of skills
- Disadvantages
  - Measures tend to be longer in duration
  - May not generalize to other curricular programs
  - Are grade-level specific



# Robust Indicators

- Also referenced as general outcome measures
  - Probes are comprised of tasks that represent proficiency in the content domain
  - INDICATORS; not the “whole” of instruction
    - Examples: oral reading fluency; estimation
  - Empirically determined through correlations with other indicators of proficiency in mathematics

# Robust Indicators

- Advantages
  - Do not have to be grade specific
  - Tend to be shorter in duration
  - May be used across curricular programs
- Disadvantages
  - May not be tied closely to instructional content
  - May not be able to provide skills analysis on instructional content
  - May not be able to evaluate maintenance and generalization of instructional skills

# **Mathematics Progress Monitoring in Elementary Grades**

# Measuring Elementary Students' Progress in Mathematics

- Mathematics measures for progress monitoring have been used with success in elementary grades since the 1980s
- Elementary measures include examples of both curriculum sampling and robust indicators
- Several measures are available commercially as computer programs or Web-based systems

# **Brief Historical Perspective of Progress Monitoring in Mathematics**

- Roots of progress monitoring (specifically curriculum-based measurement) at Institute for Research on Learning Disabilities at the Univ. of MN (mid-1970s - early 1980s)
- Stan Deno and colleagues conducted several early studies in reading that failed to demonstrate significantly improved student achievement despite teachers' accurate implementation: Researchers concluded that teachers did not comply with data-based rules for instructional decision making

# Brief History

- First large-scale experimental-contrast study that showed significantly improved student achievement was conducted by Fuchs, Deno, & Mirkin (1984) in NYC schools in reading
- Early mathematics measures focused on basic mathematics facts and some mixed-skills computational measures
- In late 1980s, Fuchs and Fuchs team developed grade-level computational measures representing skills tested in statewide high-stakes assessment program

## Brief History

- With research demonstration of improved achievement for students with mild disabilities whose teachers used progress monitoring for instructional planning in mathematics, the Fuchs and Fuchs team expanded measures to include concepts and applications
- Simultaneously, Fuchs and Fuchs implemented progress monitoring in mathematics in general education classrooms

# Features Included in Fuchs and Fuchs Program of Research

- Graphed performance and data-based decision rules
- Computer software (data management and test taking)
- Skills analysis (individual and classwide)
- Instructional recommendations
- Paired with peer-assisted learning strategies (PALS) in general education



# **Elementary-Level Measures: Curriculum Sampling Approach**

- Test items represent the critical skills in the grade-level curriculum (or represent grade-level state standards)
- Although administration time is held constant across the year, it may vary by grade level

## **Elementary-Level Measures: Curriculum Sampling Approach**

- Measures may contain only computation problems or problems representing concepts and applications, or a combination of both
- Because the same skill types are tested repeatedly, analysis of student performance with respect to specific skills is possible

# **Examples of Progress Monitoring Measures Developed Through Curriculum Sampling**

# Monitoring Basic Skills

## Progress: Basic Math

- Computation
  - For Grades 1-6, test administration varies from 2-6 minutes, depending on grade level
  - Scored as number of digits correct in answers (using specified scoring algorithms)

# Monitoring Basic Skills

## Progress: Basic Math

- Concepts and Applications
  - For Grades 2-6, test administration varies from 6-8 minutes, depending on grade level
  - Scored as one number of blanks correct
- Computer program provides skills analyses

Password: AIR

Name: \_\_\_\_\_ Date: \_\_\_\_\_

- Random numerals within problems
- Random placement of problem types on page

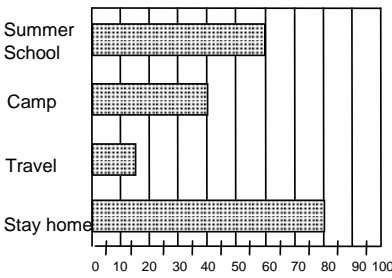
Measure taken from  
*Monitoring Basic Skills Progress: Basic Math Computation* (2nd ed.)  
 (1998)

A $9 \overline{)24}$	B $\begin{array}{r} 52852 \\ + 64708 \\ \hline \end{array}$	C $\begin{array}{r} 9 \\ \times 0 \\ \hline \end{array}$	D $4 \overline{)72}$	E $\begin{array}{r} 8285 \\ 4304 \\ + 90 \\ \hline \end{array}$
F $6 \overline{)30}$	G $\begin{array}{r} 35 \\ \times 74 \\ \hline \end{array}$	H $\begin{array}{r} 4 \\ \times 5 \\ \hline \end{array}$	I $\begin{array}{r} 7 \\ \times 9 \\ \hline \end{array}$	J $\frac{2}{3} - \frac{1}{3} =$
K $\begin{array}{r} 32 \\ \times 23 \\ \hline \end{array}$	L $\begin{array}{r} 8 \\ \times 6 \\ \hline \end{array}$	M $5 \overline{)65}$	N $6 \overline{)30}$	O $3\frac{4}{7} - 1 =$
P $\begin{array}{r} 107 \\ \times 3 \\ \hline \end{array}$	Q $2 \overline{)9}$	R $\begin{array}{r} 416 \\ - 44 \\ \hline \end{array}$	S $\frac{5}{11} + \frac{3}{11} =$	T $\begin{array}{r} 6 \\ \times 2 \\ \hline \end{array}$
U $4\frac{1}{2} + 6 =$	V $\begin{array}{r} 1504 \\ - 1441 \\ \hline \end{array}$	W $9 \overline{)81}$	X $\begin{array}{r} 130 \\ \times 7 \\ \hline \end{array}$	Y $5 \overline{)10}$

Adapted from NCSPM

•One page of a three-page measure for math concepts and applications (24 problems total)

Measure taken from  
*Monitoring Basic Skills Progress: Basic Math Concepts and Applications*  
(1999)

Name _____ Date _____ Test 4 Page 1											
Column A	Column B										
<p>(1) Write the letter in each blank.</p> <div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;"> <p>_____     •                  z</p> <p>_____     ← K →                  L</p> <p>_____     M →                  N</p> </div> <div style="margin-left: 20px;"> <p>(A) line segment</p> <p>(B) line</p> <p>(C) point</p> <p>(D) ray</p> </div> </div>	<p>(5) Write a number in the blank.</p> <p>1 week = _____ days</p>										
<p>(2) Look at this numbers.:</p> <p style="text-align: center;">356.17</p> <p>Which number is in the hundredths place? _____</p>	<p>(6) Vacation Plans for Summit School Students</p>  <table border="1" style="margin-top: 10px; width: 100%; border-collapse: collapse;"> <caption>Vacation Plans Data</caption> <thead> <tr> <th>Vacation Plan</th> <th>Number of Students</th> </tr> </thead> <tbody> <tr> <td>Summer School</td> <td>60</td> </tr> <tr> <td>Camp</td> <td>40</td> </tr> <tr> <td>Travel</td> <td>15</td> </tr> <tr> <td>Stay home</td> <td>80</td> </tr> </tbody> </table> <p style="text-align: center;">Number of Students</p> <p>Use the bar graph to answer the questions.</p> <p>The P.T.A. will buy a Summit School T-Shirt for each student who goes to summer school. Each shirt costs \$4.00. How much money will the P.T.A. spend on these T shirts? \$ _____ .00</p> <p>How many students are planning to travel during the summer? _____</p> <p>How many fewer students are planning to go to summer school than planning to stay home? _____</p>	Vacation Plan	Number of Students	Summer School	60	Camp	40	Travel	15	Stay home	80
Vacation Plan	Number of Students										
Summer School	60										
Camp	40										
Travel	15										
Stay home	80										
<p>(3) Solve the problem by estimating the sum or difference to the nearest ten.</p> <p>Jeff wheels his wheelchair for 33 hours a week at school and for 28 hours a week in his neighborhood. About how many hours does Jeff spend each week wheeling his wheelchair?</p> <p style="text-align: right;">_____</p>	<p>(7) To measure the distance of the bus ride from school to your house you would use</p> <div style="margin-left: 20px;"> <p>(A) meters</p> <p>(B) centimeters</p> <p>(C) kilometers</p> </div> <p>_____</p>										
<p>(4) Write the number in each blank.</p> <p>3 ten thousands, 6 hundreds, 8 ones</p> <p>_____</p> <p>2 thousands, 8 hundreds, 4 tens, 6 ones</p> <p>_____</p>											

Adapted from NCSPM

# Skills Profile-- by problem Class type for each student

From *Monitoring  
Basic Skills  
Progress: Basic  
Math  
Computation*  
(2nd ed.) (1998)

## CLASS SKILLS PROFILE - Computation

Teacher: Mrs. Smith

Report through 3/17

Name	A1	S1	M1	M2	M3	D1	D2	D3	F1	F2
Adam Qualls										
Amanda Ramirez										
Anthony Jones										
Aroun Phung										
Becca Jarrett										
Charles McBride										
Cindy Lincoln										
David Anderson										
Emily Waters										
Erica Jernigan										
Gary McKnight										
Icon										
Jenna Clover										
Jonathan Nichols										
Jung Lee										
Kaitlin Laird										
Kathy Taylor										
Matthew Hayes										
Michael Elliott										
Michael Sanders										
Samantha Spain										
Vicente Gonzalez										
Victoria Dillard										
Yasmine Sallee										

	COLD. Not tried	0	1	0	0	0	0	2	8	2	5
	COOL. Trying these.	3	8	0	5	14	3	16	10	3	3
	WARM. Starting to get it.	2	1	0	1	3	6	0	2	0	1
	VERY WARM. Almost have it.	5	3	8	4	0	4	0	1	1	0
	HOT. You've got it!	13	10	15	13	6	10	5	2	17	14

Adapted from NCSPM



# Ranked Scores-- Average of Last Two Scores and Slope-- Average Weekly Increase

From  
*Monitoring  
Basic Skills  
Progress:  
Basic Math  
Computation*  
(2nd ed.)  
(1998)

## **RANKED SCORES - Computation**

Teacher: Mrs. Smith

Report through 3/17

<u>Name</u>	<u>Score</u>	<u>Growth</u>
Samantha Spain _____	57 _____	+1.89
Aroun Phung _____	56 _____	+1.60
Gary McKnight _____	54 _____	+1.14
Yasmine Sallee _____	53 _____	+1.34
Kathy Taylor _____	53 _____	+1.11
Jung Lee _____	53 _____	+1.23
Matthew Hayes _____	51 _____	+1.00
Emily Waters _____	48 _____	+1.04
Charles McBride _____	43 _____	+1.12
Michael Elliott _____	42 _____	+0.83
Jenna Clover _____	42 _____	+0.78
Becca Jarrett _____	41 _____	+1.14
David Anderson _____	38 _____	+0.79
Cindy Lincoln _____	36 _____	+1.04
Kaitlin Laird _____	35 _____	+0.71
Victoria Dillard _____	34 _____	+0.64
Vicente Gonzalez _____	29 _____	+0.28
Adam Qualls _____	26 _____	+0.60
Michael Sanders _____	25 _____	+0.70
Jonathan Nichols _____	25 _____	+2.57
Amanda Ramirez _____	23 _____	+0.85
Anthony Jones _____	19 _____	+0.05
Erica Jernigan _____	18 _____	+0.23
Icon _____	0 _____	+0.00

Adapted from NCSPM

# Yearly Progress Pro™

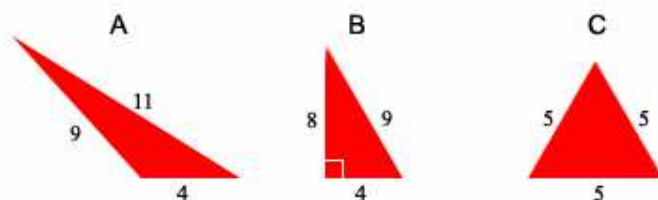
- Web-based progress monitoring system
- Both computation and problem-solving items are included on each form
- Each test, Grades 1-8, is administered for 15 minutes
- Multiple-choice format (scratch paper allowed)

# Yearly Progress Pro™

- Scored as number of problems correct (out of a total of 30)
- Provides skills analyses for class and individual students
- Program also contains instructional exercises by skill

# Yearly Progress Pro™

Which triangle is an obtuse triangle?



Perfect! Triangle A is an obtuse triangle.



5 of 6 pages

Yearly Progress Pro: Sample screen taken from an instructional exercise but also illustrates how items are presented (one by one) on progress monitoring measure

See <http://www.mhdigitallearning.com>

MATHEMATICS

# YPP: Skills Feedback Across Class

HINTS

[Print this page](#)

[Go Back](#)

HOME PAGE

TESTS

EXERCISES

REPORTS

[VIEW STUDENT ASSIGNMENTS](#)

[VIEW STUDENT REPORTS](#)

[VIEW CUSTOM TEST REPORTS](#)

[VIEW CBM REPORTS](#)

[VIEW EXERCISE REPORTS](#)

ADMINISTRATION

LOG OUT

Algebra

6th Grade Tests

CA 6th Grade

Skills:

S1 - Arithmetic sequences S4 - Graphing linear equations S7 - Transformations of the coordinate plane  
S2 - Equations as relations S5 - Relations S8 - Writing equations with patterns  
S3 - Functions S6 - The coordinate plane



	S1	S2	S3	S4	S5	S6	S7	S8
<a href="#">Meradith Allert</a>	Yellow	Red	Green	Yellow	Green	Yellow	Red	Green
<a href="#">Dennis Harvey</a>	Green	Red	Green	Yellow	Green	Red	Yellow	Green
<a href="#">William Herberts</a>	Green	Red	Red	-	Yellow	Yellow	Yellow	Green
<a href="#">Angelina Michaels</a>	Red	Red	Red	Red	Green	Green	Red	Yellow
<a href="#">Leroy Moore</a>	Green	Red	Yellow	Red	Green	Green	Green	Green
<a href="#">Christina Perez</a>	Yellow	Red	Yellow	Red	Green	Red	Yellow	Green
<a href="#">Brittany Peterson</a>	Red	Red	Red	Red	Red	Red	Red	Red
<a href="#">Melinda Rickert</a>	Yellow	Red	Green	Yellow	Green	Yellow	Red	Green
<a href="#">Jaime Santiago</a>	Green	Red	Green	Yellow	Green	Red	Yellow	Green
<a href="#">Ashley Tuttle</a>	Green	Red	Red	Red	Green	Red	Red	Green
<a href="#">Tanisha Williams</a>	Red	Red	Yellow	Red	Red	Green	Green	Green
<a href="#">Randall Wong</a>	Green	Green	Red	Red	Yellow	Green	Yellow	Yellow

Shows specific skills tested for algebra cluster at Grade 6

Green circle indicates mastery; yellow circle indicates partial mastery; red circle indicates skill is not mastered

**Examples of Progress  
Monitoring Measures  
Developed as  
Robust Indicators**

# EdCheckup: Cloze Math

- Web-based progress monitoring system
- Robust indicator consisting of basic facts in addition, subtraction, multiplication, and division--80 problems administered for 2 minutes
- May select electronic scoring option or paper and pencil option

# EdCheckup: Cloze Math

## Assessment Info

Student: gret, hansen  
Period: Spring

Test Type: Screening  
Probe: Probe 1



### Probe 1

$\boxed{2} \times 6 = 12$	$45 \div \boxed{9} = 5$	$8 + 6 = \boxed{14}$	$\boxed{\phantom{00}} \times 9 = 0$
$3 \times \boxed{\phantom{00}} = 18$	$16 \div 4 = \boxed{\phantom{00}}$	$\boxed{\phantom{00}} - 1 = 2$	$64 \div \boxed{\phantom{00}} = 8$
$0 + 1 = \boxed{\phantom{00}}$	$\boxed{\phantom{00}} + 5 = 7$	$4 \times \boxed{\phantom{00}} = 8$	$6 + 7 = \boxed{\phantom{00}}$
$\boxed{\phantom{00}} + 7 = 16$	$4 \times \boxed{\phantom{00}} = 36$	$0 \div 6 = \boxed{\phantom{00}}$	$\boxed{\phantom{00}} - 9 = 5$
$9 \times \boxed{\phantom{00}} = 9$	$1 - 0 = \boxed{\phantom{00}}$	$\boxed{\phantom{00}} + 7 = 14$	$27 \div \boxed{\phantom{00}} = 9$
$0 \div 8 = \boxed{\phantom{00}}$	$\boxed{\phantom{00}} \times 5 = 45$	$2 \pm \boxed{\phantom{00}} = 5$	$1 \times 4 = \boxed{\phantom{00}}$

Taken from <http://www.edcheckup.com>



# AIMSweb

- Web-based progress monitoring system
- Measures are printed and administered to students
- Variety of measures for Grades 1-6:
  - Basic facts by single operation or mixed operations (robust indicators)--score by correct digits in answers
  - Mixed skills by grade level (curriculum sampling)--no skills analysis available; score by correct digits in answers or by correct digits in answers and critical processes (as indicated on answer key)
- Graphs of student progress are provided

# Sample AIMSweb Basic Facts Measures

AIMSweb® Basic Addition and Subtraction Facts #1 - Intermediate Answer Key

$\begin{array}{r} 4 \\ -0 \\ \hline 4 \end{array}$ (1)	$\begin{array}{r} 7 \\ +7 \\ \hline 14 \end{array}$ (2)	$\begin{array}{r} 4 \\ +7 \\ \hline 11 \end{array}$ (2)	$\begin{array}{r} 4 \\ -4 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 9 \\ +0 \\ \hline 9 \end{array}$ (1)	$\begin{array}{r} 2 \\ -0 \\ \hline 2 \end{array}$ (1)	$\begin{array}{r} 5 \\ -5 \\ \hline 0 \end{array}$ (1)	9 (9)
$\begin{array}{r} 11 \\ -8 \\ \hline 3 \end{array}$ (1)	$\begin{array}{r} 12 \\ -6 \\ \hline 6 \end{array}$ (1)	$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$ (1)	$\begin{array}{r} 1 \\ +7 \\ \hline 8 \end{array}$ (1)	$\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$ (1)	$\begin{array}{r} 9 \\ -9 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 1 \\ +5 \\ \hline 6 \end{array}$ (1)	7 (16)
$\begin{array}{r} 12 \\ -8 \\ \hline 4 \end{array}$ (1)	$\begin{array}{r} 10 \\ -5 \\ \hline 5 \end{array}$ (1)	$\begin{array}{r} 7 \\ -3 \\ \hline 4 \end{array}$ (1)	$\begin{array}{r} 8 \\ -6 \\ \hline 2 \end{array}$ (1)	$\begin{array}{r} 12 \\ +4 \\ \hline 16 \end{array}$ (2)	$\begin{array}{r} 9 \\ +0 \\ \hline 9 \end{array}$ (1)	$\begin{array}{r} 8 \\ -1 \\ \hline 7 \end{array}$ (1)	8 (24)
$\begin{array}{r} 3 \\ +2 \\ \hline 5 \end{array}$ (1)	$\begin{array}{r} 8 \\ +8 \\ \hline 16 \end{array}$ (2)	$\begin{array}{r} 9 \\ -7 \\ \hline 2 \end{array}$ (1)	$\begin{array}{r} 12 \\ -2 \\ \hline 10 \end{array}$ (2)	$\begin{array}{r} 3 \\ +6 \\ \hline 9 \end{array}$ (1)	$\begin{array}{r} 1 \\ -1 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 10 \\ -2 \\ \hline 8 \end{array}$ (1)	9 (33)
$\begin{array}{r} 2 \\ +7 \\ \hline 9 \end{array}$ (1)	$\begin{array}{r} 1 \\ +8 \\ \hline 9 \end{array}$ (1)	$\begin{array}{r} 9 \\ -2 \\ \hline 7 \end{array}$ (1)	$\begin{array}{r} 5 \\ -0 \\ \hline 5 \end{array}$ (1)	$\begin{array}{r} 0 \\ +3 \\ \hline 3 \end{array}$ (1)	$\begin{array}{r} 9 \\ +1 \\ \hline 10 \end{array}$ (2)	$\begin{array}{r} 5 \\ +3 \\ \hline 8 \end{array}$ (1)	8 (41)
$\begin{array}{r} 9 \\ -9 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 8 \\ -7 \\ \hline 1 \end{array}$ (1)	$\begin{array}{r} 4 \\ +9 \\ \hline 13 \end{array}$ (2)	$\begin{array}{r} 10 \\ -6 \\ \hline 4 \end{array}$ (1)	$\begin{array}{r} 3 \\ +7 \\ \hline 10 \end{array}$ (2)	$\begin{array}{r} 6 \\ +0 \\ \hline 6 \end{array}$ (1)	$\begin{array}{r} 9 \\ -5 \\ \hline 4 \end{array}$ (1)	9 (50)

Page 1 of 2

AIMSweb® Basic Multiplication and Division Facts #1 Answer Key

$\begin{array}{r} 0 \\ \times 4 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 7 \\ \times 7 \\ \hline 49 \end{array}$ (2)	$\begin{array}{r} 4 \\ \times 7 \\ \hline 28 \end{array}$ (2)	$\begin{array}{r} 7 \\ 5 \overline{)35} \\ \hline \end{array}$ (1)	$\begin{array}{r} 9 \\ \times 0 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 1 \\ 2 \overline{)2} \\ \hline \end{array}$ (1)	$\begin{array}{r} 5 \\ 6 \overline{)30} \\ \hline \end{array}$ (1)	9 (9)
$\begin{array}{r} 11 \\ \times 8 \\ \hline 88 \end{array}$ (2)	$\begin{array}{r} 9 \\ \times 5 \\ \hline 45 \end{array}$ (2)	$\begin{array}{r} 5 \\ \times 2 \\ \hline 10 \end{array}$ (2)	$\begin{array}{r} 1 \\ 8 \overline{)8} \\ \hline \end{array}$ (1)	$\begin{array}{r} 12 \\ 8 \overline{)96} \\ \hline \end{array}$ (2)	$\begin{array}{r} 9 \\ 9 \overline{)81} \\ \hline \end{array}$ (1)	$\begin{array}{r} 1 \\ \times 7 \\ \hline 7 \end{array}$ (1)	11 (20)
$\begin{array}{r} 12 \\ 8 \overline{)96} \\ \hline \end{array}$ (2)	$\begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array}$ (2)	$\begin{array}{r} 3 \\ \times 7 \\ \hline 21 \end{array}$ (2)	$\begin{array}{r} 10 \\ \times 8 \\ \hline 80 \end{array}$ (2)	$\begin{array}{r} 9 \\ 4 \overline{)36} \\ \hline \end{array}$ (1)	$\begin{array}{r} 6 \\ \times 0 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 8 \\ \times 1 \\ \hline 8 \end{array}$ (1)	11 (31)
$\begin{array}{r} 3 \\ \times 2 \\ \hline 6 \end{array}$ (1)	$\begin{array}{r} 9 \\ 11 \overline{)99} \\ \hline \end{array}$ (1)	$\begin{array}{r} 8 \\ 6 \overline{)48} \\ \hline \end{array}$ (1)	$\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$ (2)	$\begin{array}{r} 1 \\ 7 \overline{)7} \\ \hline \end{array}$ (1)	$\begin{array}{r} 1 \\ \times 1 \\ \hline 1 \end{array}$ (1)	$\begin{array}{r} 9 \\ 2 \overline{)18} \\ \hline \end{array}$ (1)	8 (39)
$\begin{array}{r} 1 \\ 8 \overline{)8} \\ \hline \end{array}$ (1)	$\begin{array}{r} 1 \\ 8 \overline{)8} \\ \hline \end{array}$ (1)	$\begin{array}{r} 9 \\ \times 2 \\ \hline 18 \end{array}$ (2)	$\begin{array}{r} 0 \\ \times 5 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 0 \\ \times 3 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 9 \\ \times 1 \\ \hline 9 \end{array}$ (1)	$\begin{array}{r} 8 \\ 5 \overline{)40} \\ \hline \end{array}$ (1)	8 (47)
$\begin{array}{r} 6 \\ 7 \overline{)42} \\ \hline \end{array}$ (1)	$\begin{array}{r} 5 \\ 8 \overline{)40} \\ \hline \end{array}$ (1)	$\begin{array}{r} 12 \\ \times 6 \\ \hline 72 \end{array}$ (2)	$\begin{array}{r} 5 \\ 8 \overline{)40} \\ \hline \end{array}$ (1)	$\begin{array}{r} 1 \\ 8 \overline{)8} \\ \hline \end{array}$ (1)	$\begin{array}{r} 5 \\ \times 0 \\ \hline 0 \end{array}$ (1)	$\begin{array}{r} 9 \\ 6 \overline{)54} \\ \hline \end{array}$ (1)	8 (55)

Page 1 of 2

# Additional Resources

## Progress Monitoring Measures

- AIMSweb website: <http://www.aimsweb.com>
- Edcheckup website:  
<http://www.edcheckup.com>
- Monitoring Basic Skills Progress (Macintosh (OS 9) computer program available through  
<http://www.proedinc.com>
- Project AAIMS website (algebra progress monitoring measures and research results)  
[www.ci.hs.iastate.edu/aaims](http://www.ci.hs.iastate.edu/aaims)
- Yearly Progress Pro website:  
<http://www.mhdigitallearning.com>

# Additional Resources

## National Centers

- National Center on Student Progress Monitoring (NCSPM):  
<http://www.studentprogress.org>
- Research Institute on Progress Monitoring (RIPM): <http://www.progressmonitoring.org>