

Responsiveness-to-Intervention

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Specify that you want the Albany keynote ppt.

This Presentation

- Responsiveness-to-Intervention (RTI)
- Curriculum-Based Measurement (CBM), An Essential Component of RTI
- Using CBM within RTI
 - Identify risk for poor learning outcomes
 - Determine responsiveness to intervention
 - Enhance student outcomes

Responsiveness-to-Intervention

- Responsiveness-to-intervention (RTI) integrates assessment and intervention within a multi-level prevention system to identify and reduce risk for poor learning outcomes.
- The purpose of RTI is to reduce the risk of serious, long-term, negative consequences associated with exiting school without the skills need to succeed in life.

Overarching RTI Framework

- *Primary Prevention*

- All children receive the universal, core instructional program.
- All children are tested once in the fall.
- At-risk students are identified as potentially at-risk for academic failure.
- The progress of potentially at-risk students is monitored for 6-8 weeks to (dis)confirm risk and identify students for secondary prevention.

Overarching RTI Framework

- *Secondary Prevention*

- For at-risk students, a second level of prevention is implemented using standard research-validated tutoring protocols.
- Student progress is monitored throughout intervention.
- Progress is classified as responsive or unresponsive.
- Responsive students return to primary prevention, with ongoing progress monitoring.

Overarching RTI Framework

- *Tertiary Prevention*
- Unresponsive students enter tertiary prevention, where
 - Individual student goals are set ambitiously.
 - Ongoing progress monitoring is used in a formative and inductive way to design individual programs that are effective.
 - Ongoing progress monitoring is also used to identify when students have met benchmarks that permit flexible re-entry to secondary or primary prevention.
 - Often (but not always), schools conceptualize tertiary prevention as special education.

Why Primary, Secondary, and Tertiary Prevention Levels Rather Than Tiers?

- Confusion over tiers
 - Your Tier 2 might be the same as my Tier 5.
 - Tiers don't communicate levels of intensity.
 - e.g., Some schools use a series of small-group tutoring protocols, referring to them as different tiers, even though they represent the same level of intensity.
- Prevention levels instead communicate clear differences in intensity, with clearly defined professional responsibilities.
 - Primary prevention: General education classroom teachers
 - Secondary prevention: Support staff (e.g., reading coaches, school psychologists, special educators) training/supervising non-certified staff
 - Tertiary prevention: Highly skilled, knowledgeable teachers (often special educators)

The Origins of RTI

- The notion of a multi-level prevention system is borrowed from the health-care system.

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Health Care Analogy

- High blood pressure (HBP) can lead to heart attacks or strokes (*like academic failure can produce serious long-term negative consequences*).
- At the annual check-up (primary prevention), HBP screening (*like annual fall screening for low reading or math scores*).
- If screening suggests HBP, then monitoring over 6-8 weeks occurs to verify HBP (*like PM to [dis]confirm risk*).
- If HBP is verified, secondary prevention occurs with relatively inexpensive diuretics, which are effective for vast majority, and monitoring continues (*like small-group secondary preventive tutoring, using a standard treatment protocol, with progress monitoring to index response*).
- For patients who fail to respond to secondary prevention (diuretics), then tertiary prevention occurs—experimentation with more expensive medications (e.g., ACE inhibitors, beta blockers) or doses or combinations of meds, with ongoing monitoring, to determine which drug or combination of drugs is effective (*like individualized instructional programs inductively formulated with progress monitoring*).

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Press to Implement RTI

- A press to consider a multi-level prevention system emanates from the federal law on disabilities, in which RTI is permitted as a method for identifying learning disabilities.

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Using RTI to identify Learning Disabilities

LD as nonresponders to validated instruction (unexpected underachievement).

Assumption: If a child does not respond to instruction that is effective for the vast majority of children, then there is something different about the child causing the lack of response.

RTI eliminates poor instructional quality as a viable explanation for learning difficulty.

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Twin Purposes of RTI

- To reorient service delivery to provide early intervention
- To provide an alternative method of LD identification

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Major Advantages of RTI Approach

- Provides assistance to needy children in timely fashion. It is NOT a wait-to-fail model.
- Helps ensure that the student's poor academic performance is not due to poor instruction.

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This Presentation

- Responsiveness-to-Intervention (RTI)
- Curriculum-Based Measurement (CBM), the Scientifically Validated Approach to Progress Monitoring
- Using CBM within RTI

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Progress Monitoring Is An Essential Form of Assessment within RTI

To screen students' risk for academic failure.

To determine whether students respond to primary and secondary prevention.

For students who fail to respond to secondary prevention, to build individualized instructional programs.

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Curriculum-Based Measurement

*the scientifically validated form of
progress monitoring*

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Research Shows

- CBM produces meaningful information about students' academic levels and their rates of improvement.
- CBM is sensitive to student improvement.
- CBM corresponds well with high-stakes tests.
- When teachers use CBM to inform their instructional decisions, students achieve better.

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CBM is NOT Mastery Measurement

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MASTERY MEASUREMENT Tracks Mastery of Short-term Instructional Objectives

To implement Mastery Measurement,
the teacher

- Determines the sequence of skills in an instructional hierarchy
- For each skill, develops a criterion-referenced test

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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

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Multidigit Addition Mastery Test

Name: _____ Date _____

Adding

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

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

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

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

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

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

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

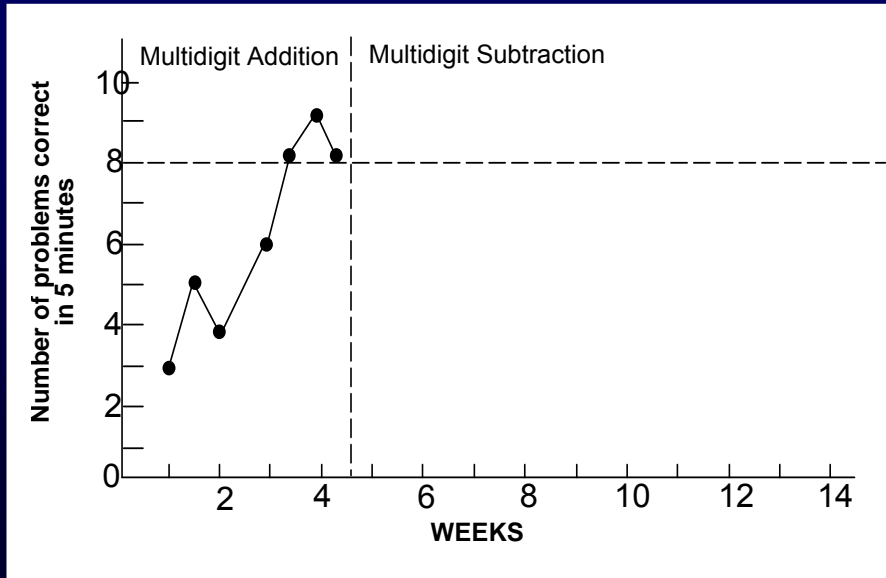
$$\begin{array}{r} 34824 \\ + 69426 \\ \hline \end{array}$$

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

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

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Mastery of Multidigit Addition



Hypothetical Fourth-Grade Math Computation Curriculum

1. Multidigit addition with regrouping
2. ***Multidigit subtraction with regrouping***
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9. Add/subtract simple fractions, like denominators
10. Add/subtract whole number and mixed number

Problems with Mastery Measurement

- Hierarchy of skills is logical, not empirical.
- Performance on single-skill assessments can be misleading.
- Assessment does not reflect maintenance or generalization.
- Assessment is designed by teachers or sold with textbooks, with unknown reliability and validity.
- SO THAT, the number of objectives mastered does not relate well to performance on high-stakes tests.

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**CBM was designed to address
these problems.**

An Example of CBM:
Math Computation

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Hypothetical Fourth-Grade Math Computation Curriculum

- Multidigit addition with regrouping
- Multidigit subtraction with regrouping
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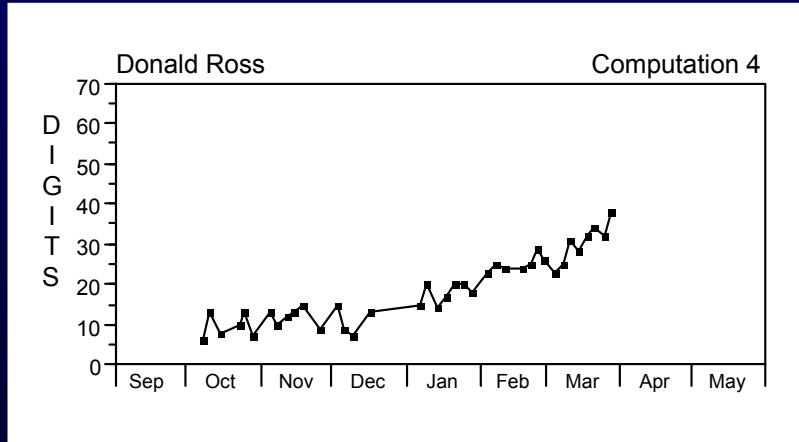
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- Each weekly test incorporates the same problem types, but problems are not the same and are in a different order.

Sheet #1		Computation 4		
Password: ARM				
Name: _____		Date: _____		
A $\frac{3}{7} - \frac{2}{7} =$	B $\frac{6}{7} + 3 =$	C $4 \overline{)6}$	D $6 \overline{)78}$	E $\begin{array}{r} 875 \\ \times 7 \\ \hline \end{array}$
F $\begin{array}{r} 6 \\ \times 7 \\ \hline \end{array}$	G $\begin{array}{r} 9 \\ \times 0 \\ \hline \end{array}$	H $\begin{array}{r} 244 \\ \times 7 \\ \hline \end{array}$	I $6 \overline{)48}$	J $5 \overline{)20}$
K $2 \overline{)50}$	L $\begin{array}{r} 6144 \\ - 4420 \\ \hline \end{array}$	M $\begin{array}{r} 33 \\ \times 10 \\ \hline \end{array}$	N $\begin{array}{r} 6 \\ \times 0 \\ \hline \end{array}$	O $7 \overline{)30}$
P $\begin{array}{r} 95225 \\ + 75268 \\ \hline \end{array}$	Q $6 \overline{)32}$	R $\begin{array}{r} 1156 \\ 2824 \\ + 83 \\ \hline \end{array}$	S $7\frac{4}{7} - 2 =$	T $\begin{array}{r} 38 \\ \times 33 \\ \hline \end{array}$
U $\frac{3}{5} + \frac{1}{5} =$	V $\begin{array}{r} 982 \\ - 97 \\ \hline \end{array}$	W $\begin{array}{r} 9 \\ \times 5 \\ \hline \end{array}$	X $\begin{array}{r} 4 \\ \times 1 \\ \hline \end{array}$	Y $7 \overline{)56}$

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Donald's Progress Across the School Year



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**First page of
a 3-page CBM
in math
concepts and
applications
(24 total
problems)**

Name _____ Date _____ Test 4 Page 1

Applications 4

(1) Write the letter in each blank.

_____ Z (A) line segment
 ← K L (B) line
 M N (C) point
 (D) ray

(2) Look at this numbers.:
 356.17
 Which number is in the hundredths place? _____

(3) Solve the problem by estimating the sum or difference to the nearest ten.
 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?

(4) Write the number in each blank.
 3 ten thousands, 6 hundreds, 8 ones

 2 thousands, 8 hundreds, 4 tens, 6 ones

(5) Write a number in the blank.
 1 week = _____ days

(6) Vacation Plans for Summit School Students

Use the bar graph to answer the questions.

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

How many students are planning to travel during the summer? _____

How many fewer students are planning to go to summer school than planning to stay home? _____

(7) To measure the distance of the bus ride from school to your house you would use
 (A) meters
 (B) centimeters
 (C) kilometers

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Sampling performance on year-long curriculum for each CBM

- Avoids need to specify a skills hierarchy.
- Avoids single-skill tests.
- Automatically assesses maintenance/generalization.
- Permits standardized procedures for sampling the curriculum, with known reliability and validity.
- SO THAT: CBM scores relate well to performance on high-stakes tests.

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Two CBM Methods for Representing Year-Long Performance

Method #1:

Systematically sample items from the annual curriculum (illustrated in Math CBM, just presented)

Method #2:

Identify a global behavior that simultaneously requires the many skills taught in the annual curriculum (illustrated in Reading CBM, presented next)

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Hypothetical Grade 2 Reading Curriculum

- Phonics
 - cvc patterns
 - cvce patterns
 - cvvc patterns . . .
- Sight Vocabulary
- Comprehension
 - Identification of who/what/when/where
 - Identification of main idea
 - Sequence of events
- Fluency

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Grade 2 Reading CBM

- Each week, every student reads aloud from a different second-grade passage for 1 minute.
- Each week's passage is the same difficulty.
- As student reads, teacher marks errors.
- Teacher counts number of words read correctly and graphs scores.

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CBM passage for Correct Words Per Minute

Mom was going to have a baby. Another one! That is all we need thought Samantha who was ten years old. Samantha had two little brothers. They were brats. Now Mom was going to have another one. Samantha wanted to cry.

"I will need your help," said Mom. "I hope you will keep an eye on the boys while I am gone. You are my big girl!"

Samantha told Mom she would help. She did not want to, thought. The boys were too messy. They left toys everywhere. They were too loud, too. Samantha did not want another baby brother. Two were enough.

Dad took Samantha and her brothers to the hospital. They went to Mom's room. Mom did not feel good. She had not had the baby. The doctors said it would be later that night. "I want to wait here with you," said Samantha. "Thank you Samantha. But you need to go home. You will get too sleepy. Go home with Grandma. I will see you in the morning," said Mom.

That night Samantha was sad. She knew that when the new baby came home that Mom would not have time for her. Mom would spend all of her time with the new baby.

The next day Grandma woke her up. "Your mom had the baby last night," Grandma said. "We need to go to the hospital. Get ready. Help the boys get ready, too."

Samantha slowly got ready. She barely had the heart to get dressed. After she finished, she helped the boys. They sure were a pain! And now another one was coming. Oh brother!

Soon they were at the hospital. They walked into Mom's room. Mom was lying in the bed. Her tummy was much Smaller. Samantha . . .

CBM

- Not interested in making students read faster.
- Interested in students becoming better readers.
- The CBM score is an overall indicator of reading competence.
- Students who score high on CBM are better at
 - Decoding
 - Sight vocabulary
 - Comprehension.
- CBM correlates highly with performance on high-stakes tests.

Kindergarten Letter-Sound Fluency

Teacher: *Say the sound
that goes with each
letter.*

Time: 1 minute

p U z u y
i t R e w
O a s d f
v g j S h
k m n b V
Y E i c x
...

Grade 1 Word-Identification Fluency

Teacher: *Read these
words.*

Time: 1 minute.

two
for
come
because
last
from
...

Grades 2-3 Passage Reading Fluency

- Number of words read aloud correctly in 1 minute on end-of-year passages

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Grades 4-6 Maze Fluency

- Number of words replaced correctly in 2.5 minutes on end-of-year passages from which every 7th word has been deleted and replaced with 3 choices
- Student reads and circles correct words for 2.5 minutes. Score is number of correct replacements before a ceiling of 3 consecutive errors is reached.

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Grades 4-6 Maze Fluency

THE CAVE TRIP

Mrs. Jones said that Cindy's class [~~was~~/step/ hill] going on a field trip. The [~~stare~~/class/ green] of third graders had never been [~~on~~/so] a field trip before. Cindy was [~~had~~/very] excited. Mrs. Jones said that the [~~class~~/chair/ peach] was going on a field trip [~~to~~/to] see the caves up in the mountains. [~~Show~~/And/ The] class had been studying about caves [~~four~~ sat/ kill] the last few weeks. Cindy [~~was~~/and/ ill] her classmates had seen pictures of [~~shoot~~/cave/ sing]. Now, they were going to see [~~fall~~/or] real cave.

A week later, the students [~~then~~/her/ and] Mrs. Jones climbed onto a bus [~~four~~/that/ since] would take them to [~~the~~/the/ sit] cave. It was early in the morning [~~to~~/tap/ and] the air was chilly. Mrs. Jones [~~to~~/not/ had] warned all of the students to [~~bring~~/allow/ horse] a sweater because the air might [~~be~~/to/ is] chilly in the cave. Cindy was [~~work~~/jump/ very] glad that she had brought her sweater.

[~~Rain~~/Halt/ That] bus driver started the engine and [~~the~~/to/ get] bus began to roll. The bus [~~trolled~~/mother/ girls] along the freeway. Finally the bus [~~lather~~/coffee/ rolled] into a little country road that [~~late~~/led/ gear] to the cave.

When the students arrived at the [~~goat~~/math/ cave], all they could [~~see~~/kite/ lot] was a mountain with a big [~~toys~~/trees/ black] hole in the side. A

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Overarching RTI Framework

- *Primary Prevention*
 - All children receive the universal, core instructional program.
 - All children are tested once in the fall to identify students as potentially at-risk for academic failure.
 - The progress of potentially at-risk students is monitored for 6-8 weeks to (dis)confirm risk and identify students for secondary prevention.

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Primary Prevention: Screening for Possible Reading Risk

Grade	CBM Probe	Cut-off
Kinder	Letter Sound Fluency	< 10 letters/minute
Grade 1	Word Identification Fluency	< 15 words on list/minute
Grade 2	Passage Reading Fluency	< 15 words in text/minute
Grade 3	Passage Reading Fluency	< 50 words in text/minute
Grade 4	Maze Fluency	< 10 Maze replacements/ 2.5 minutes
Grade 5	Maze Fluency	< 15 Maze replacements/ 2.5 minutes
Grade 6-7	Maze Fluency	< 20 Maze replacements/ 2.5 minutes

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Primary Prevention: Confirming Risk Status With PM

- At the end of 6 to 8 weeks, student risk status is confirmed or disconfirmed.

Grade	Inadequate Reading Slope	Inadequate Math Computation Slope	Inadequate Math Concepts and Applications Slope
Kindergarten	< 1 (LSF)	< 0.20	< 0.20
Grade 1	< 1.8 (WIF)	< 0.25	< 0.30
Grade 2	< 1 (PRF)	< 0.20	< 0.30
Grade 3	< 0.75 (PRF)	< 0.20	< 0.50
Grade 4	< 0.25 (Maze)	< 0.50	< 0.50
Grade 5	< 0.25 (Maze)	< 0.50	< 0.50
Grade 6-8	< 0.25 (Maze)	< 0.50	< 0.50

Note: These figures may change pending additional RTI research.

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CBM in RTI: Determining Responsiveness to The Standard Tutoring Protocol in Secondary Prevention

- CBM is administered weekly throughout tutoring.
- If CBM slope or projected year-end performance are adequate, student returns to primary prevention (but weekly CBM continues).
- If neither slope and year-end performance are both inadequate, then student moves to tertiary (individualized) prevention.

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Secondary Prevention: Determining Responsiveness to The Standard Tutoring Protocol in Secondary Prevention

Grade	CBM Probe	< Slope	< End level
Kindergarten	Letter Sound Fluency	< 1	< 30
Grade 1	Word Identification Fluency	< 1.8	< 30
Grade 2	Passage Reading Fluency	< 1	< 60
Grade 3	Passage Reading Fluency	< 0.75	< 70
Grade 4	Maze Fluency	< 0.25	< 25
Grade 5	Maze Fluency	< 0.25	< 25
Grade 6	Maze Fluency	< 0.25	< 25

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CBM To Design Individualized Programs in Tertiary Prevention

- Begin tertiary prevention with a validated tutoring protocol, but implement more frequently, and/or with longer sessions, with smaller group size.
- Collect CBM weekly to systematically experiment with instructional components. In this way, individually tailor the tutoring protocol to match the student's needs and ensure its effectiveness for that student.

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Sam's Case Study

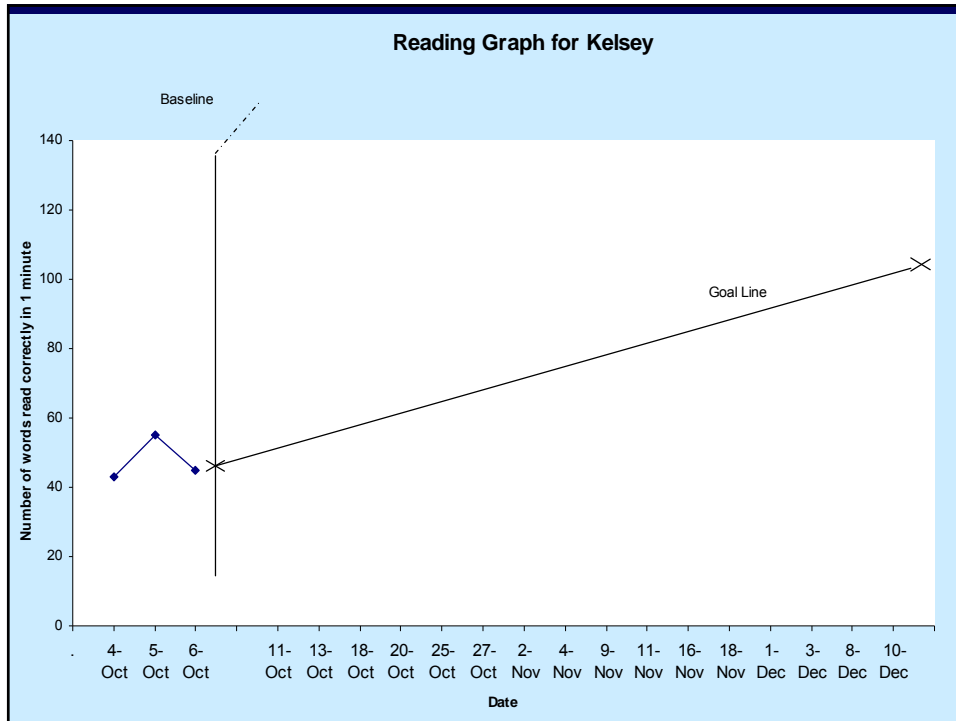
- Sam developed sizeable reading deficits by the end of 2nd grade, despite strong primary and secondary prevention.
- In 3rd grade, Sam entered tertiary prevention. In Sam's school, tertiary prevention was delivered as part of special education.
- Given Sam's large reading deficits, his teacher, Mrs. Hayes, set his IEP goal as competent 2nd-grade performance at the end of 3rd grade.

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Sam's Case Study

- She began with the Wilson program, but conducted sessions more intensively (twice daily, each time for 30 minutes, on a 1:1 basis).
- She also implemented CBM. Each weekly test systematically assessed overall competence in the 2nd-grade reading curriculum using passage reading fluency.
- The score on each week's CBM test is an overall indicator of reading competence at 2nd grade.

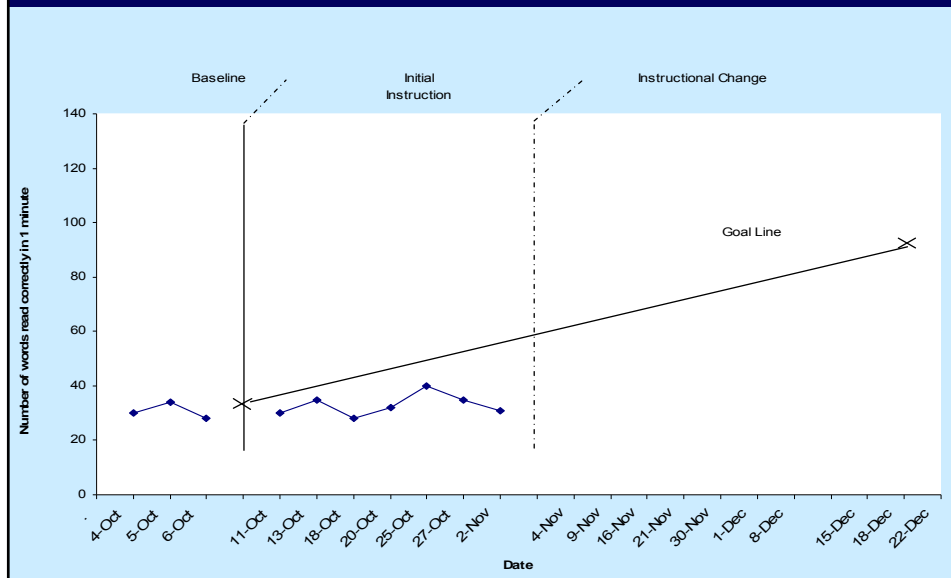
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After Seven Weeks with Intensified Wilson Program,

- Mrs. Hayes studied Sam's progress.
- On his graph, Sam's scores were all below his goal line. Research tells us that with this pattern, Sam is not likely to achieve the year-end goal.
- So Mrs. Hayes needed to revise Sam's instructional program to foster greater progress.

Sam: Time to Make A Change



Sam

- To determine the nature of the instructional change she would implement for Sam, Mrs. Hayes conducted a Quick Miscue Analysis during Sam's next CBM testing.
- The Quick Miscue Analysis is one strategy for conducting a diagnostic analysis of Sam's reading strategies and gaining insight into productive directions for supplementing the Wilson program and for building Sam's individualized program.

Larry ^{saw} was ^{him/ (T provided)} very excited! His father	6
had ^{our} just ^b brought home a new puppy. Larry's	14
brother and sister ^{was} were going to be ^{much} very	22
^{sorpray} surprised, too.	24
The little ^{pup} puppy was ^{blue} black and brown	31
with a ^{for} few white patches. Her ^{much} ears ^{His} were long	40
and ^{funny} floppy . Her ^{teeth} tummy ^{were} nearly touched the	47
ground. Dad said ^{growl} this ^{our} dog ^{puppy} was a ^{boy} beagle . //	55
Larry thought their new dog was cute.	62
He couldn't decide what he wanted to name	70

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Word Written	Word Spoken	Grapho-phonemic	Syntax	Semantics
was	saw	no	yes	no
very	him	no	no	no
excited	-----	no	no	no
just	our	no	no	no
brought	b	minimal	no	no
brother	mother	yes	yes	no
were	was	minimal	yes	yes
very	much	no	yes	yes
surprised	sorpray	yes	no	no
puppy	pup	yes	yes	yes
Quick Miscue Analysis		30%	50%	30%

Sam's Instructional Change

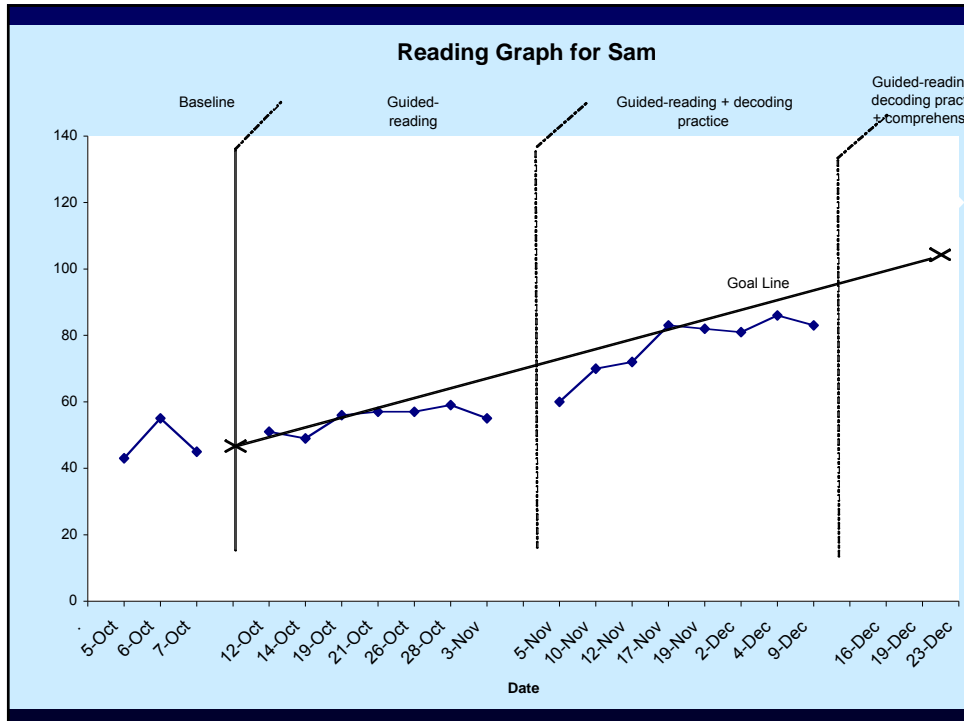
- Given Sam's inadequate reliance on the semantics of the passage, Mrs. Hayes decided to introduce a tape recorder activity, whereby Sam monitored semantic miscues in his own reading.
- Given Sam's poor use of grapho-phonemic strategies, Mrs. Hayes also conducted a diagnostic assessment of Sam's decoding skills. She learned that Sam had difficulty with vowel teams and decided to target vowel teams for intensive review in and out of contextualized reading.
- These changes were incorporated into the Wilson program.

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After Seven Weeks with This Revised Wilson Program,

- Mrs. Hayes again studied Sam's progress.
- She drew a line of best fit through Sam's CBM scores to characterize his rate of progress. His rate of progress had improved substantially with this revised Orton program.
- However, Sam's most recent 4 CBM all scores fell below his goal line. Research tells us that with this pattern, Sam is not likely to achieve his year-end goal.

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Sam's Next Instructional Change

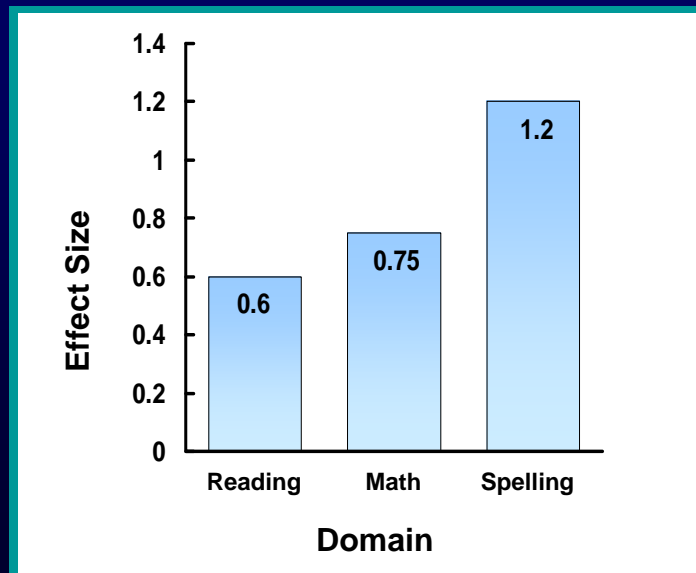
- So, Mrs. Hayes knew that she needed to make another instructional change.
- She decided to introduce a systematic reinforcement program to reward on-task behavior and hard, accurate work during the tutoring sessions.

In This Way ...

- Mrs. Hayes continues this iterative process over time, using the data to formatively design an individualized program that works for Sam.
- Field-based randomized control trials show that when teachers use CBM in this way, they plan more differentiated instruction, and they effect better student outcomes.

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Effect Sizes for CBM



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In Sum ...

- RTI is a promising framework for preventing the serious negative consequences associated with exiting school without the skills need to succeed in life.
- CBM is a critical component of the RTI system.
- Within RTI, CBM is used to
 - Identify risk for poor learning outcomes
 - Determine responsiveness to intervention
 - Enhance student outcomes.
- CBM is a signature practice for individualizing instruction for students who do not respond to the validated, standard tutoring protocols used in secondary prevention.

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