

Curriculum Based Measurement: Your Instructional GPS



*Connecticut Branch of the International Dyslexia Association's
Annual Conference:
Response to Reading Intervention:
Making it Work from Organization to Implementation*

*Albertus Magnus College
October 23, 2009*

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WITH SPECIAL THANKS AND ACKNOWLEDGEMENT OF THE WORK AND RESOURCES FROM:

- National Center on
- Response to Intervention
- www.rti4success.org

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WHAT IS “PROGRESS MONITORING”?

- ❖ Progress Monitoring (PM) a method of assessment designed to:
 - Identify students who are not demonstrating adequate progress
 - Estimate rates of student improvement
 - Compare the efficacy of different forms of instruction and design more effective, individualized instructional programs for problem learners
 - Be conducted in a frequent and ongoing manner



WHAT IS THE DIFFERENCE BETWEEN TRADITIONAL ASSESSMENTS AND PM?

- ❖ Characteristics of “traditional assessments”:
 - Lengthy tests
 - Not administered on a regular basis
 - Do not provide teachers with immediate feedback
 - Student scores are based on national scores and averages, whereas the student’s classroom may differ tremendously from the national student sample



WHAT IS THE DIFFERENCE BETWEEN TRADITIONAL ASSESSMENTS AND PM?

- ❖ Characteristics of a type of Progress Monitoring (PM): Curriculum-Based Measurement (CBM)
 - CBM is an efficient, easy, and effective method to measure student progress
 - Data can be analyze readily by teachers and student goals and instructional programs can be adjusted in response to current data analysis
 - Student data can be compared to local data (classroom, grade level in school or district)



WHAT IS CURRICULUM-BASED ASSESSMENT?

- ❖ Curriculum-Based Assessment (CBA)
 - Measurement materials aligned with school curriculum
 - Measurement is frequent
 - **Assessment** information is used to formulate instructional decisions
- ❖ CBM is one type of (CBA)



Most assessment/testing
done in schools is
mastery measurement.

**Student progress monitoring
using CBM is not
mastery measurement.**



WHAT IS “MASTERY MEASUREMENT”?

- ❖ Involves measuring for “mastery” of a series of short-term instructional objectives
- ❖ Mastery Measurement requires
 - A planned instructional scope and sequence for the school year
 - Criterion-referenced testing procedures aligned with checkpoints in the instructional sequence



EXAMPLE OF MASTERY MEASUREMENT: 4TH 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 ADDITION MASTERY TEST

Name: _____ Date _____

Adding

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

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

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

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

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

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

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

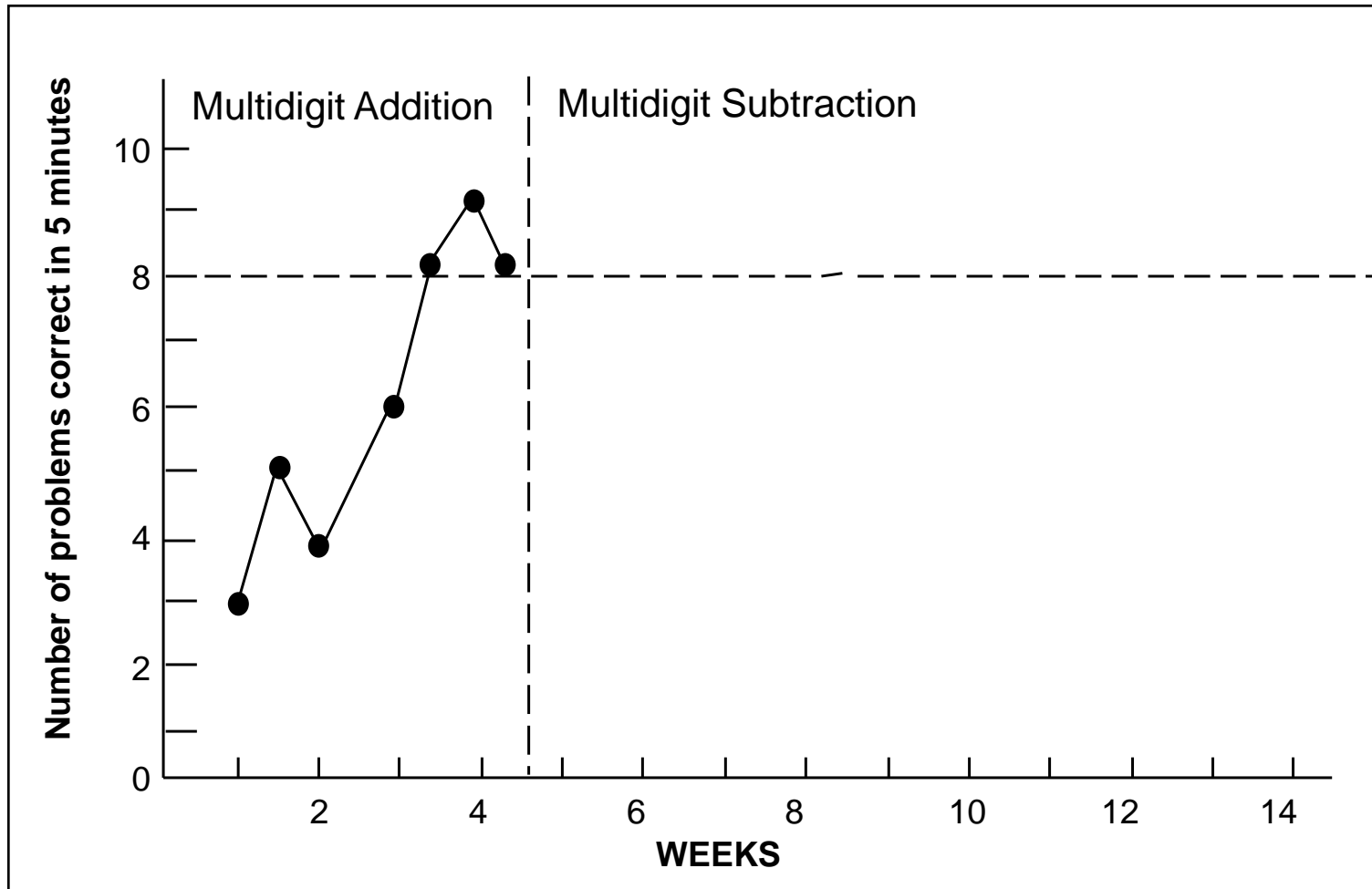
$$\begin{array}{r} 34824 \\ + 69426 \\ \hline \end{array}$$

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

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



Multidigit Addition Mastery Test



4th 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 Mastery Test

Name: _____ Date _____

Subtracting

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

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

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

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

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

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

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

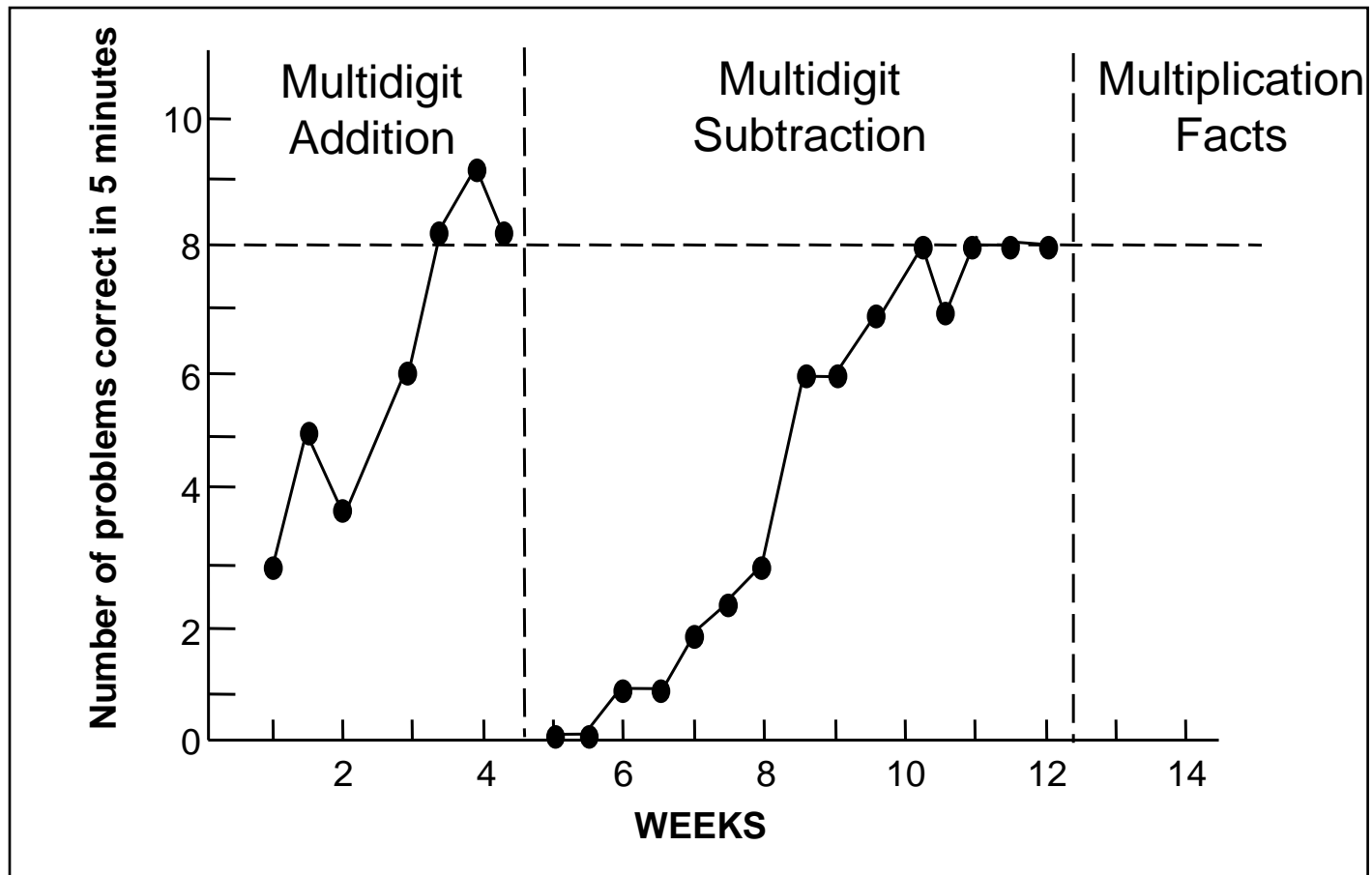
$$\begin{array}{r} 3484 \\ - 426 \\ \hline \end{array}$$

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

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



Multidigit Subtraction Mastery Test



PROBLEMS ASSOCIATED WITH MASTERY MEASUREMENT:

- ❖ Hierarchy of skills is logical, not empirical
- ❖ Assessment does not reflect maintenance or generalization
- ❖ Measurement methods are usually designed by teachers, with unknown reliability and validity



CURRICULUM-BASED MEASUREMENT (CBM) IN COMPARISON TO MASTERY MEASUREMENT:

- ❖ CBM makes no assumptions about instructional hierarchy for determining measurement
- ❖ CBM incorporates automatic tests of retention and generalization



CBM as a Type of Curriculum-Based Assessment

- ❖ CBM is distinctive:
 - Each CBM test is of equivalent difficulty
 - ❖ Samples the year-long curriculum
 - CBM is highly prescriptive and standardized
 - ❖ Reliable and valid scores



THE BASICS OF CBM

- ❖ CBM monitors student progress throughout the school year
- ❖ Students are given probes at regular intervals
- ❖ Weekly, bi-weekly, monthly
- ❖ Teachers use student data to quantify short- and long-term goals that will meet end-of-year goals



THE BASICS OF CBM

- ❖ CBM tests are brief and easy to administer
- ❖ All tests are different, but assess the same skills and the same difficulty level
- ❖ CBM scores are graphed so teachers can use data to make individualized decisions about instructional programs and teaching methods



- ❖ Yields Information About
 - Academic standing as well as growth
 - Global competence as well as skill-by-skill Mastery

- ❖ Can Answer Questions About
 - Interindividual difference
 - Intraindividual improvement
 - How to strengthen programs



2nd Grade Reading CBM



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



Grade 2 Reading CBM

- ❖ Each week, every student reads aloud from a second-grade passage for 1 minute
- ❖ Each week's passage is the same difficulty
- ❖ As student reads, teacher marks errors
- ❖ Count number of words read correctly
- ❖ Graph scores



CBM

- ❖ Not interested in making kids read faster
- ❖ Interested in kids becoming better readers
- ❖ The CBM score is an overall indicator of reading competence
- ❖ Students who score high on CBM
 - Are better decoders
 - Are better at sight vocabulary
 - Are better comprehenders
- ❖ Correlates highly with other global measures of reading (e.g. high stakes testing; commercially available tests; teacher made tests)



CBM Passage for CWPM

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 . . .

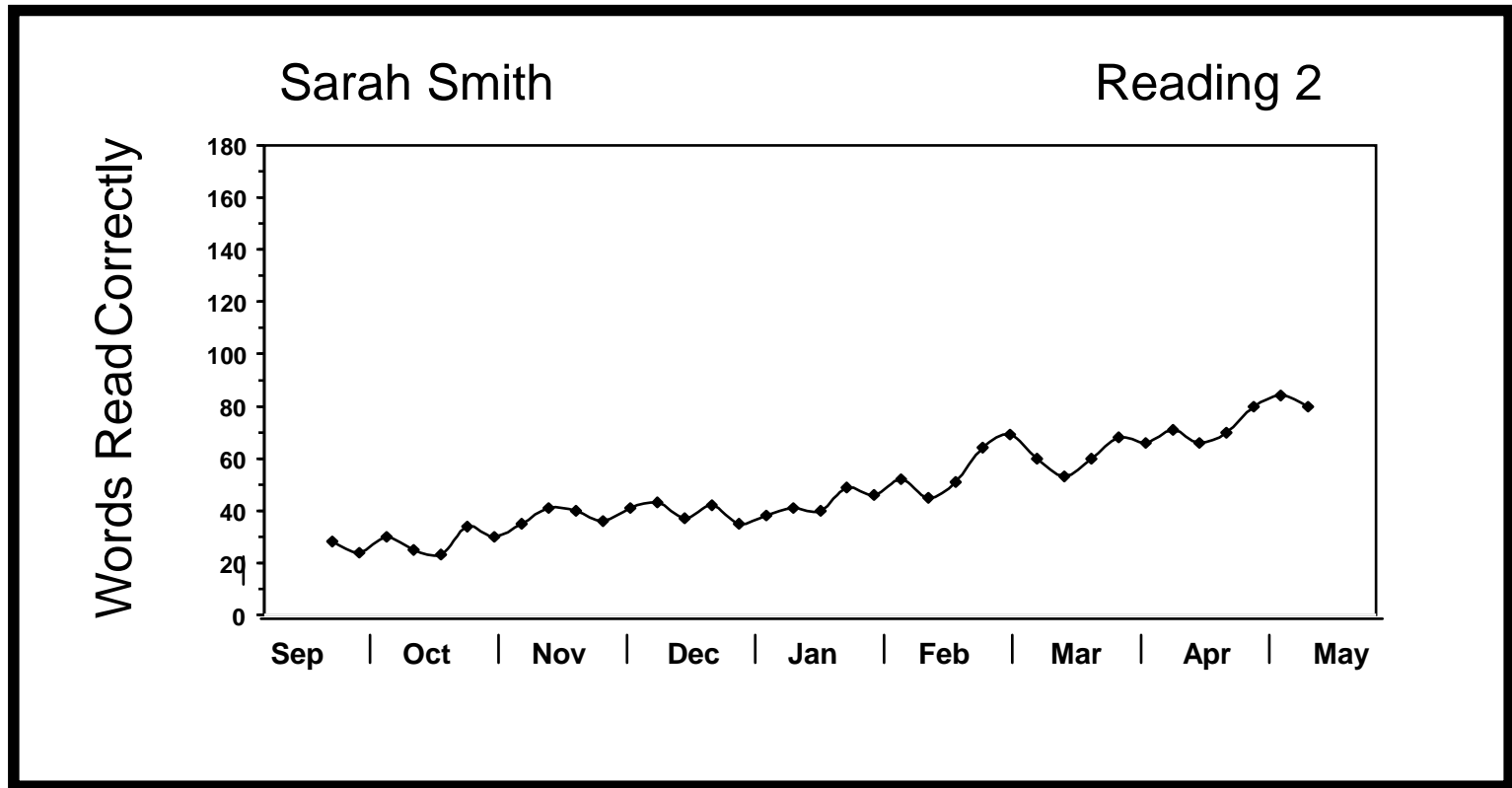


What We Look for in CBM

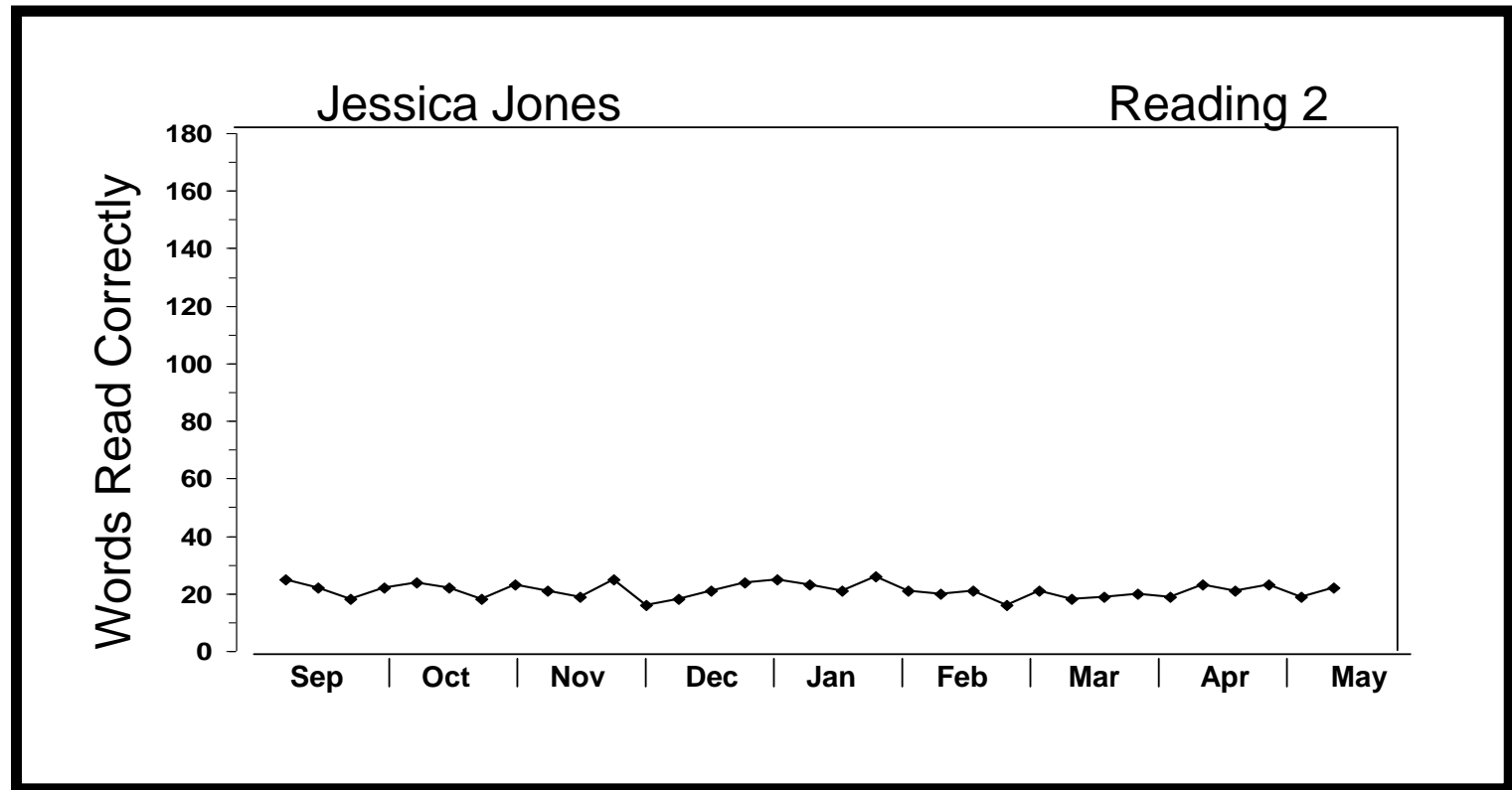
- ❖ Students whose scores are going up
 - Indicates they are becoming better readers
- ❖ Students whose scores are flat
 - Indicates they are not profiting from instructional program and require a change in their instructional program



Sarah's Progress on Words Read Correctly



Jessica's Progress on Words Read Correctly



In Sum, CBM Is Used to:

- ❖ Identify at-risk students who may need intervention
- ❖ Help teachers plan more effective, differentiated instruction
- ❖ Help specialists design more effective instructional programs for students who do not respond to general education
- ❖ Document student progress for accountability purposes, including IEPs
- ❖ Communicate with parents or other professionals about student progress



CBM Research

- ❖ CBM research spans more than 30 years
- ❖ Research has demonstrated that when teachers use CBM for instructional decision making:
 - Students learn more
 - Teacher decision making improves
 - Students are more aware of their performance



STEPS TO CONDUCTING CBM

- Step 1: How to Place Students in a Reading CBM Task for Progress Monitoring (PM)
- Step 2: How to Identify the Level for Material for PM for Passage Reading Fluency and Maze Fluency
- Step 3: How to Administer & Score Reading CBM
- Step 4: How to Graph Scores
- Step 5: How to Set Ambitious Goals
- Step 6: How to Apply Decision Rules to Graphed Scores to Know When to Revise Programs and Increase Goals
- Step 7: How to Use the CBM Database Qualitatively to Describe Students' Strengths and Weaknesses



STEP 1: HOW TO PLACE STUDENTS IN A READING CBM TASK

- Kindergarten
 - Letter Sound Fluency
- Grade 1
 - Word Identification Fluency
- Grades 2-3
 - Passage Reading Fluency
- Grades 4-6
 - Maze Fluency




STEP 2: HOW TO IDENTIFY THE LEVEL OF MATERIAL FOR MONITORING PROGRESS

- Generally, students use the CBM materials prepared for their grade level
- However, some students may need to read from a different grade level if they are well below grade-level expectations



Step 2: How to Identify the Level of Material for Monitoring Progress

- To find the appropriate CBM level:
 - Determine grade level text for student
 - Administer 3 CBM Passage Reading Fluency passages
 - If the student reads less than 10 correct words in 1 minute, use the CBM word identification fluency measure instead of CBM PRF or CBM Maze Fluency for progress monitoring.
 - If student reads 10-50 words correct in 1 minute but with less than 85-90% accuracy, move to next lower CBM level
 - If student reads more than 50 words correct in 1 minute, move to the highest level of text where he/she reads between 10-50 words correct until the student reaches his/her grade level
- 

STEP 3: HOW TO ADMINISTER AND SCORE READING PROBES

- Students read letters, isolated words or passages for 1 minute
- Student reads out loud while teacher marks student errors
- The number of letters or words correct is calculated and graphed on student graph
- Four CBM reading tasks are considered



CBM LETTER SOUND FLUENCY (LSF)

- For kindergarten students
- Student presented with page of 26 random letters on LSF Student Copy
- Student reads the letter sounds for 1 minute
- Teacher marks errors on LSF Teacher Score Sheet



CBM LETTER SOUND FLUENCY (LSF)

- Student copy of LSF
- Letters in the box are practice

b	c	h	a
---	---	---	---

m	c	e	q	h	
d	j	y	a	n	
t	x	b	g	u	
s	z	p	f	l	
w	i	r	k	o	v



CBM LETTER SOUND FLUENCY (LSF)

- LSF Teacher Score Sheet
- Errors are marked with a slash (/)
- Score is adjusted if student completes in less than 1 minute

Score Sheet

Student's Name _____ Examiner's Initials _____
Teacher's Name _____ Date of Testing _____
School _____

Letter Sound Fluency Test

If child does not say anything after 3 seconds: do not say anything, point to next letter. If names incorrect letter: keep going. Draw a diagonal slash through any letters the student does not say the sound for or says the sound incorrectly. Circle the last item that child attempts. Stop at 1 minute. If finished before 1 minute: record time.

m c e q h d j y a n t x b g u s z p f l w i r k o v

_____ number of letters sounded correctly (in _____ seconds)

_____ adjusted score (if completed test in less than 1 minute)



CBM LETTER SOUND FLUENCY (LSF)

- Only short vowel sounds are correct.
- If the student answers correctly, immediately point to the next letter on the student's copy.
- If the student does not respond after 3 seconds, point to the next letter.



CBM LETTER SOUND FLUENCY (LSF)

- Do not correct errors.
- Mark errors on teacher's score sheet.
- At 1 minute, circle the last letter the child attempts.



CBM LETTER SOUND FLUENCY (LSF)

- ❖ Abby's CBM LSF
- ❖ Errors are marked with a slash (/)
- ❖ Last sound (/r/) is circled
- ❖ 23 sounds attempted
- ❖ 5 incorrect
- ❖ Abby's score = 18

Score Sheet

Student's Name Abby H. Examiner's Initials JF
Teacher's Name Mrs. Fischer Date of Testing Nov. 18
School Darby Elementary

Letter Sound Fluency Test

If child does not say anything after 3 seconds: do not say anything, point to next letter. If names incorrect letter: keep going. Draw a diagonal slash through any letters the student does not say the sound for or says the sound incorrectly. Circle the last item that child attempts. Stop at 1 minute. If finished before 1 minute: record time.

m c e ~~g~~ h d j ~~y~~ a n t x ~~b~~ g u s z p ~~f~~ l w l (r) k o v

18 number of letters sounded correctly (in 60 seconds)

_____ adjusted score (if completed test in less than 1 minute)



ADJUSTING THE SCORE

- $\frac{\text{\# of sounds correct}}{\text{\# of seconds}} = A$
- $A \times 60 = \text{Adjusted score}$
- Example: 20 correct sounds in 45 seconds
- $20 / 45 = .44$
- $.44 * 60 = 26.67$
- Adjusted score = 27 in 60 seconds



CBM WORD IDENTIFICATION FLUENCY (WIF)

- For first-grade students
- Student presented with a list of 50 words
- Student reads words for 1 minute
- Teacher marks errors on WIF Score Sheet



CBM Word Identification Fluency (WIF)

❖ CBM WIF Student list

List 13

and	always	gave
as	going	car
at	until	probably
one	saw	fire
said	end	taken
into	room	problems
could	far	tree
than	form	common
new	become	hot
back	government	using
such	himself	doing
things	sun	main
same	known	thus
find	war	ask
went	learn	comes
between	I'm	street
want	eat	



CBM Word Identification Fluency (WIF)

- ❖ WIF Teacher Score Sheet
- ❖ Words read correctly marked as '1'
- ❖ Words read incorrectly marked as '0'

List 13

Student's Name: _____

Examiner's Initials: _____

Student's Teacher: _____

Date: _____

Score 1 for correct response, 0 for incorrect response.

and _____

always _____

gave _____

as _____

going _____

car _____

at _____

until _____

probably _____

one _____

saw _____

fire _____

said _____

end _____

taken _____

into _____

room _____

problems _____

could _____

far _____

tree _____

than _____

form _____

common _____

new _____

become _____

hot _____

back _____

government _____

using _____

such _____

himself _____

doing _____

things _____

sun _____

main _____

same _____

known _____

thus _____

find _____

war _____

ask _____

went _____

learn _____

comes _____

between _____

I'm _____

street _____

want _____

eat _____

Total score = _____



CBM Word Identification Fluency (WIF)

- Shameka's CBM WIF
- Correct words marked as '1'
- Incorrect words marked as '0'
- Last word read (car) is circled
- Shameka's score = 29

List 13

Student's Name: Shameka S.

Examiner's Initials: ST

Student's Teacher: Mr. Towler

Date: Jan. 15

Score 1 for correct response, 0 for incorrect response.

and 1

always 1

gave 1

as 1

going 0

car 1

at 1

until 1

probably

one 1

saw 1

fire

said 0

end 1

taken

into 1

room 1

problems

could 1

far 1

tree

than 1

form 0

common

new 1

become 0

hot

back 1

government 0

using

such 1

himself 1

doing

things 1

sun 1

main

same 1

known 0

thus

find 0

war 1

ask

went 1

learn 1

comes

between 1

I'm 1

street

want 1

eat 1

Total score = 29



CBM PASSAGE READING FLUENCY (PRF)

- For students in grades 1-6
- Student reads grade-appropriate passage for 1 minute from PRF Student copy
- Teacher marks errors on PRF Teacher copy



CBM Passage Reading Fluency (PRF)

○ PRF Student copy

Raymond lived in Georgia. He was born there and had many friends. One day Dad had come home from work to say that they would have to move far away. Dad worked in a factory. The factory had closed and Dad needed a new job. Dad had found a new job and now they had to move.

Raymond was sad because he did not want to leave his school. He did not want to leave his friends.

"I am sorry, son," said Dad.

"It is OK," said Raymond with a smile. He did not want Dad to feel bad.

They packed up the car and moved to a new state. Their new house was old and scary. "I wonder whether there are any ghosts living in our house," said Raymond. The house was big and dark. The front of the house was covered by trees. Even the trees looked scary. The blowing breeze made them look alive.

Inside, the house was dark, so Dad fixed the lights and turned them on. Then they unpacked the car and Raymond went up to his new room. The walls were cracked. Dad would paint them. Raymond was afraid to open the closet. He would do it later.

Raymond went down to the kitchen. Mom was making dinner. She had fried chicken and potatoes cooking because these were Raymond's favorites.

After dinner Raymond felt sleepy, so he went to his room to go to sleep. "Good night!" he called down to Mom and Dad.

"Sweet dreams," they said back.

Raymond got into bed and turned out the light. He began to fall asleep. Then he heard a loud noise. It came from the closet. Raymond



CBM Passage Reading Fluency (PRF)

- PRF Teacher copy
- Numbers along margin allow for easy calculation of words attempted

Raymond lived in Georgia. He was born there and had many	11
friends. One day Dad had come home from work to say that they	24
would have to move far away. Dad worked in a factory. The factory	37
had closed and Dad needed a new job. Dad had found a new job and	52
now they had to move.	57
Raymond was sad because he did not want to leave his school.	69
He did not want to leave his friends.	77
"I am sorry, son," said Dad.	83
"It is OK," said Raymond with a smile. He did not want Dad to	97
feel bad.	99
They packed up the car and moved to a new state. Their new	112
house was old and scary. "I wonder whether there are any ghosts	124
living in our house," said Raymond. The house was big and dark. The	137
front of the house was covered by trees. Even the trees looked scary.	150
The blowing breeze made them look alive.	157
Inside, the house was dark, so Dad fixed the lights and turned	169
them on. Then they unpacked the car and Raymond went up to his new	183
room. The walls were cracked. Dad would paint them. Raymond was	194
afraid to open the closet. He would do it later.	204
Raymond went down to the kitchen. Mom was making dinner.	214
She had fried chicken and potatoes cooking because these were	224
Raymond's favorites.	226
After dinner Raymond felt sleepy, so he went to his room to go	239
to sleep. "Good night!" he called down to Mom and Dad.	250
"Sweet dreams," they said back.	255
Raymond got into bed and turned out the light. He began to fall	268
asleep. Then he heard a loud noise. It came from the closet. Raymond	281



CBM Passage Reading Fluency (PRF)

- Scoring guidelines:

- Repetitions, self-corrections, insertions, and dialectical differences are all scored as CORRECT
- Mispronunciations, word substitutions, omitted words, hesitations (word not said within 3 seconds), and reversals are all scored as ERRORS



CBM PASSAGE READING FLUENCY (PRF)

- 135 words attempted in 1 minute
- 14 of 15 words omitted in 4th line subtracted from 135 (135 - 14 = 121)
- 1 omission error and 8 reading errors subtracted from 121 (121 - 9 = 112)
- Reggie's score = 112

Raymond lived in Georgia. He was born there and had many friends. One day Dad had come home from work to say that they would have to move far away. Dad worked in a factory. The factory had closed and Dad needed a new job. Dad had found a new job and now they had to move.	11 24 37 52 57
Raymond was sad because he did not want to leave his school. He did not want to leave his friends.	69 77
"I am sorry, son," said Dad.	83
"It is OK," said Raymond with a smile. He did not want Dad to feel bad.	97 99
They packed up the car and moved to a new state. Their new house was old and scary. "I wonder whether there are any ghosts living in our house," said Raymond. The house was big and dark. The front of the house was covered by trees. Even the trees looked scary. The blowing breeze made them look alive.	112 124 137 150 157
Inside, the house was dark, so Dad fixed the lights and turned them on. Then they unpacked the car and Raymond went up to his new room. The walls were cracked. Dad would paint them. Raymond was afraid to open the closet. He would do it later.	169 183 194 204
Raymond went down to the kitchen. Mom was making dinner. She had fried chicken and potatoes cooking because these were Raymond's favorites.	214 224 226
After dinner Raymond felt sleepy, so he went to his room to go to sleep. "Good night!" he called down to Mom and Dad.	239 250
"Sweet dreams," they said back.	255
Raymond got into bed and turned out the light. He began to fall asleep. Then he heard a loud noise. It came from the closet. Raymond	268 281



CBM Maze Fluency

- For students in grades 1-6
- Administered to a group of students at one time
- Students read passage and circle correct word for each blank
- Tests lasts for 2.5 minutes
- Teacher grades each test later



CBM Maze Fluency

- Maze Student copy
- Students receive 1 point for each correct answer
- Scoring is discontinued if 3 consecutive errors are made

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 [be/ on/ so] a field trip before. Cindy was [bed/ went/ very] excited. Mrs. Jones said that the [class/ chair/ peach] was going on a field trip [at/ to/ is] see the caves up in the mountains. [Show/ And/ The] class had been studying about caves [for/ sad/ kill] the last few weeks. Cindy [wet/ and/ ill] her classmates had seen pictures of [shout/ caves/ sing]. Now, they were going to see [a/ are/ or] real cave.

A week later, the students [then/ her/ and] Mrs. Jones climbed onto a bus [four/ that/ dime] would take them to [and/ the/ sat] cave. It was early in the morning [sit/ tap/ and] the air was chilly. Mrs. Jones [got/ sat/ had] warned all of the students to [bring/ pillow/ horse] a sweater because the air might [be/ to/ it] chilly in the cave. Cindy was [work/ jump/ very] glad that she had brought her sweater.

[Rain/ Halt/ The] bus driver started the engine and [the/ was/ got] bus began to roll. The bus [rolled/ mother/ girls] along the freeway. Finally the bus [lather/ coffee/ pulled] onto a little country road that [ate/ led/ pear] 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



CBM Maze Fluency

- ❖ Juan's CBM Maze
- ❖ 10 correct answers before he made 3 consecutive mistakes
- ❖ Juan's score = 10

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 [~~he~~/on/so] a field trip before. Cindy was [~~bed~~/went/very] excited. Mrs. Jones said that the [~~class~~/chair/peach] was going on a field trip [~~at~~/to/is] see the caves up in the mountains. [~~Show~~/And/The] class had been studying about caves [~~for~~/sad/kill] the last few weeks. Cindy [~~wet~~/and/ill] her classmates had seen pictures of [~~shout~~/caves/sing]. Now, they were going to see [~~a~~/are/or] real cave.

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

[~~Rain~~/Halt/The] bus driver started the engine and [~~the~~/was/got] bus began to roll. The bus [~~rolled~~/mother/girls] along the freeway. Finally the bus [~~lather~~/coffee/pulled] onto a little country road that [~~ate~~/led/pear] 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



Step 4: How to Graph CBM Scores

- Graphing student scores is vital
- Graphs provide teachers with a straightforward way of
 - Reviewing a student's progress
 - Monitoring the appropriateness of student goals
 - Judging the adequacy of student progress
 - Comparing and contrasting successful and unsuccessful instructional aspects of a student's program

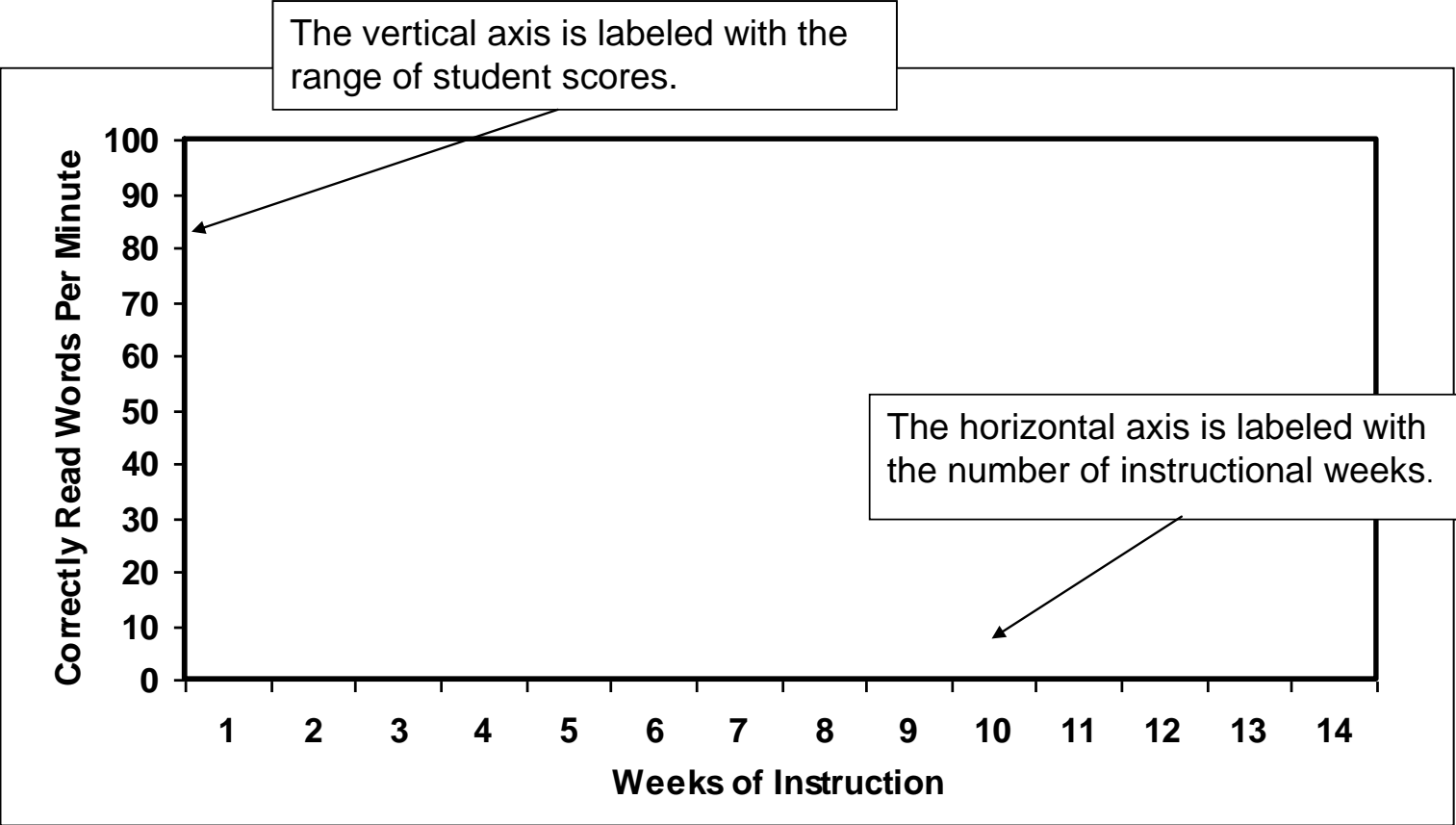


Step 4: How to Graph CBM Scores

- Teachers can use computer graphing programs
- Teachers can create their own graphs
 - Create template for student graph
 - Use same template for every student in the classroom
 - Vertical axis has range of student scores
 - Horizontal axis has number of weeks

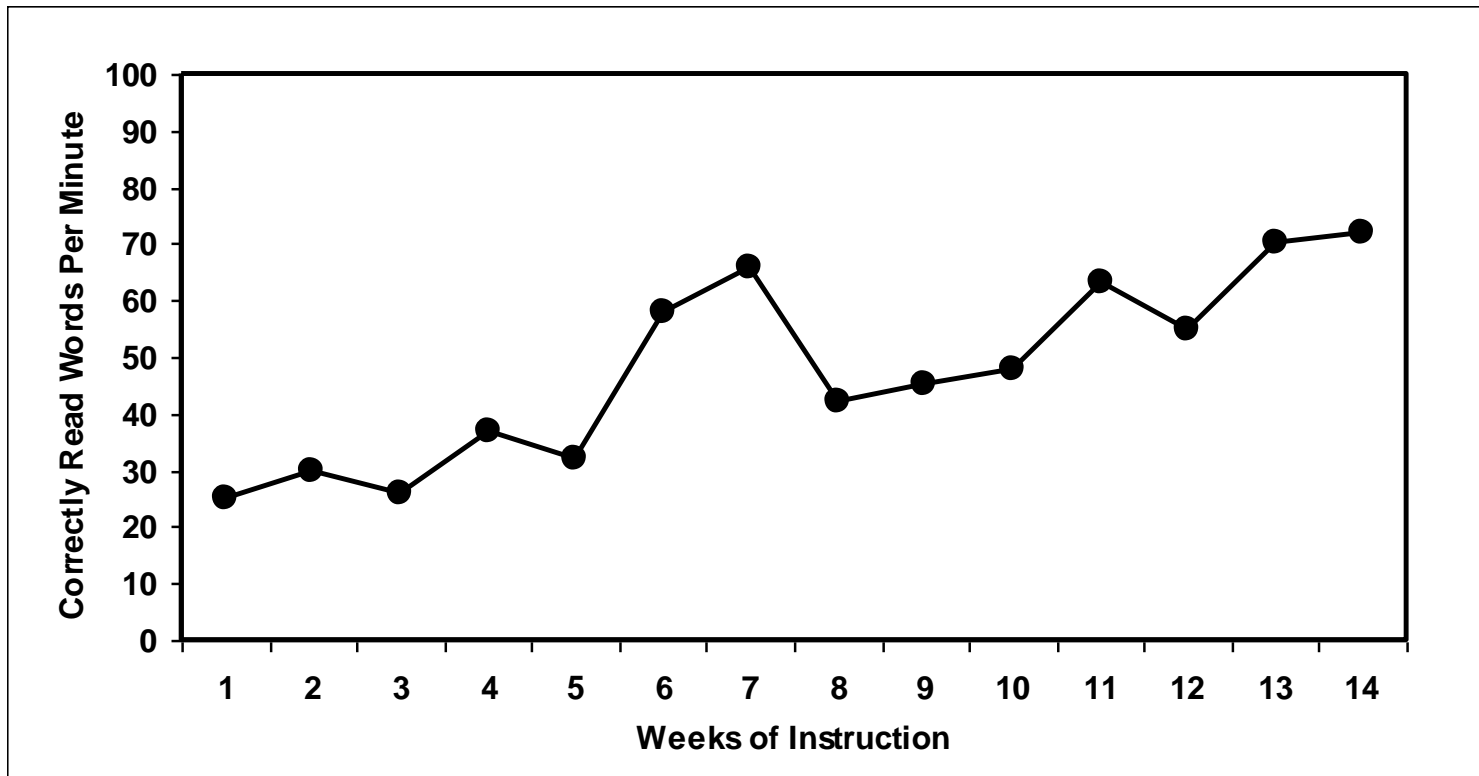


Step 4: How to Graph CBM Scores



STEP 4: HOW TO GRAPH CBM SCORES

- Student scores are plotted on graph and a line is drawn between scores



STEP 5: HOW TO SET AMBITIOUS GOALS

- Once a few scores have been graphed, the teacher decides on an end-of-year performance goal for each student
- Three options for making performance goals:
 - End-of-Year Benchmarking
 - National Norms
 - Intra-Individual Framework



Step 5: How to Set Ambitious Goals

- ❖ **End-of-Year Benchmarking**
- ❖ For typically developing students, a table of benchmarks can be used to find CBM end-of-year performance goal

Grade	Benchmark
Kindergarten	40 letter sounds per minute (CBM LSF)
1 st Grade	60 words correct per minute (CBM WIF) 50 words correct per minute (CBM PRF)
2 nd Grade	75 words correct per minute (CBM PRF)
3 rd Grade	100 words correct per minute (CBM PRF)
4 th Grade	20 correct replacements per 2.5 minutes (CBM Maze)
5 th Grade	25 correct replacements per 2.5 minutes (CBM Maze)
6 th Grade	30 correct replacements per 2.5 minutes (CBM Maze)



Step 5: How to Set Ambitious Goals

- **National Norms**
- For typically developing students, a table of average rates of weekly increase can be used to find end-of-year performance goal

Grade	PRF Norms	Maze Norms
1 st Grade	2.00	0.40
2 nd Grade	1.5	0.40
3 rd Grade	1.0	0.40
4 th Grade	0.90	0.40
5 th Grade	0.50	0.40
6 th Grade	0.30	0.40



Step 5: How to Set Ambitious Goals

- Median: 29
- 4th Grade PRF Norm: 0.90
- Multiply by weeks left: $16 \times 0.90 = 14.4$
- Added to median: $14.4 + 29 = 43.4$
- 43.0 is end-of-year performance goal

Grade	PRF Norms	Maze Norms
1 st Grade	2.00	0.40
2 nd Grade	1.5	0.40
3 rd Grade	1.0	0.40
4 th Grade	0.90	0.40
5 th Grade	0.50	0.40
6 th Grade	0.30	0.40



STEP 5: HOW TO SET AMBITIOUS GOALS

- Intra-Individual Framework
- Weekly rate of improvement is calculated using at least 8 data points
- Baseline rate is multiplied by 1.5
- Product multiplied by number of weeks until end of school year
- Added to student's baseline score to produce end-of-year performance goal



Step 5: How to Set Ambitious Goals

- 1st 8 scores: 10, 12, 9, 14, 12, 15, 12, 14
- Difference between first and third median scores: $14 - 10 = 4$
- Divided by (weeks -1): $4 \div (8 - 1) = 0.57$
- Multiplied by baseline: $0.57 \times 1.5 = 0.855$
- Multiplied by weeks left: $0.855 \times 14 = 11.97$
- Product added to median: $11.97 + 10 = 21.97$
- 22 is end-of-year performance goal

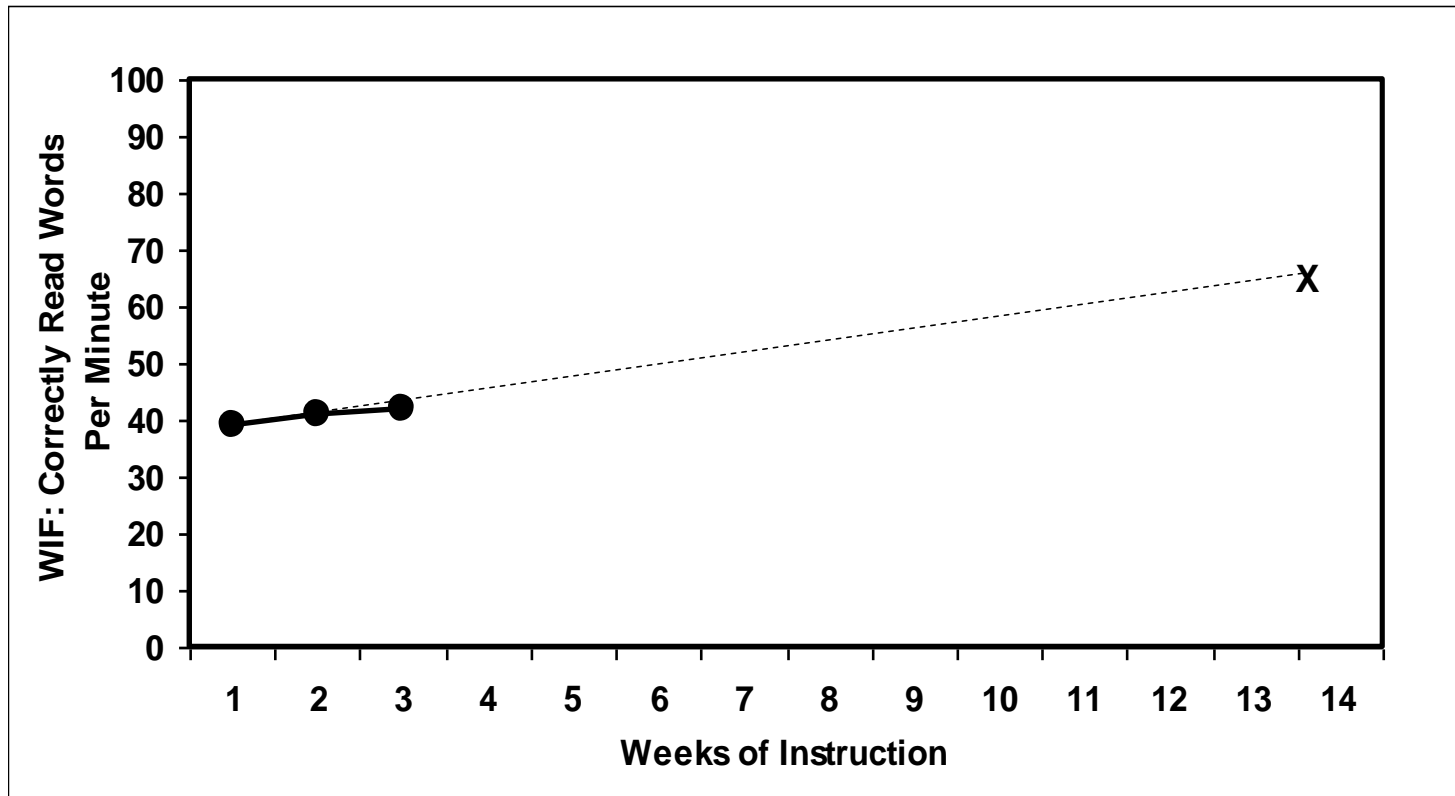


STEP 5: HOW TO SET AMBITIOUS GOALS

- Once the end-of-year performance goal has been created, the goal is marked on the student graph with an “X”
- A goal-line is drawn between the median of the student’s scores and the “X”



STEP 5: HOW TO SET AMBITIOUS GOALS



STEP 5: HOW TO SET AMBITIOUS GOALS

- After drawing the goal-line, teachers continually monitor student graphs
- After 7-8 CBM scores, teachers draw a trend-line to represent actual student progress
 - Goal-line and trend-line are compared
- Trend-line is drawn using the Tukey method



STEP 5: HOW TO SET AMBITIOUS GOALS

- Tukey method

- Graphed scores are divided into 3 fairly equal groups
- Two vertical lines drawn between groups

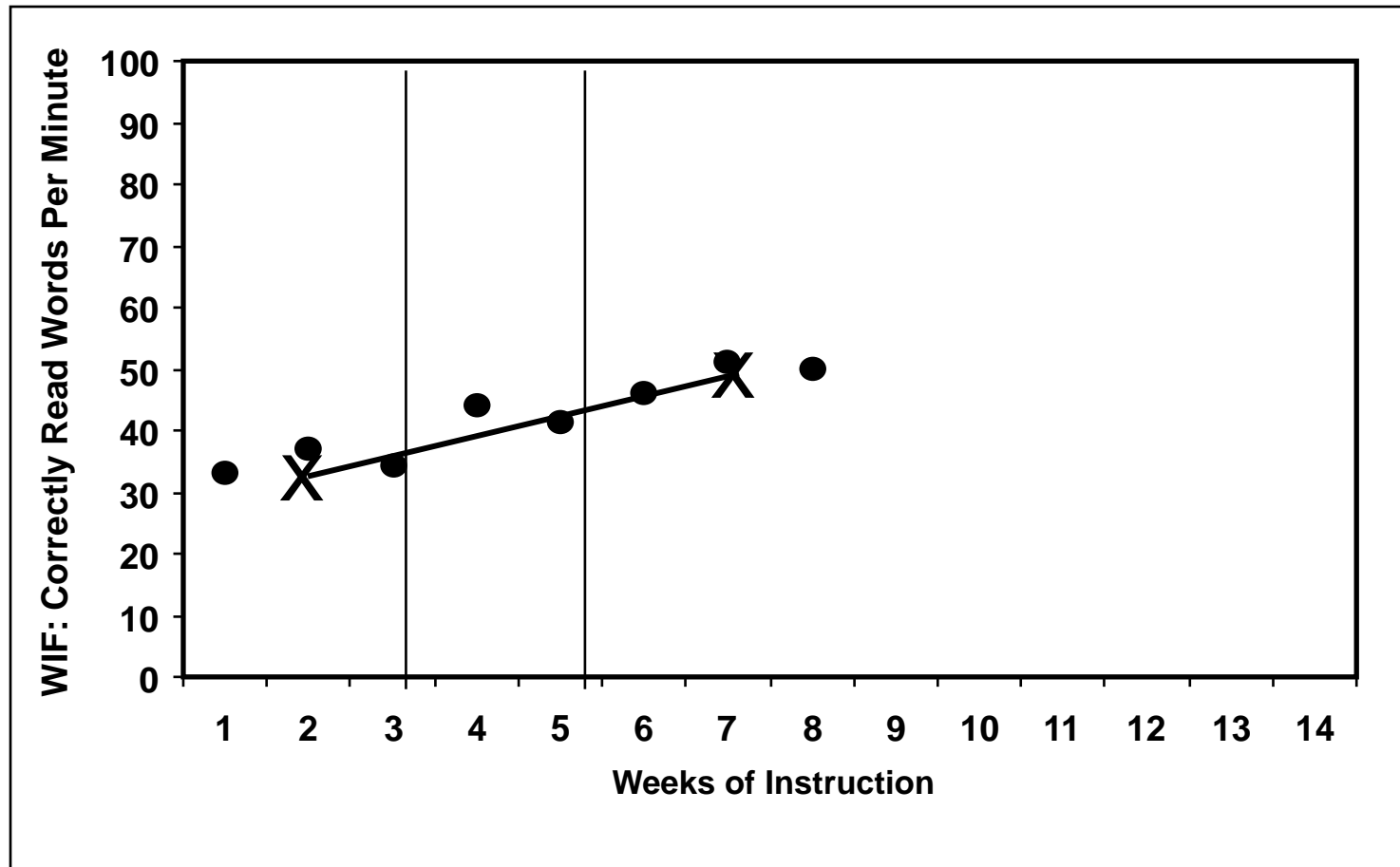


STEP 5: HOW TO SET AMBITIOUS GOALS

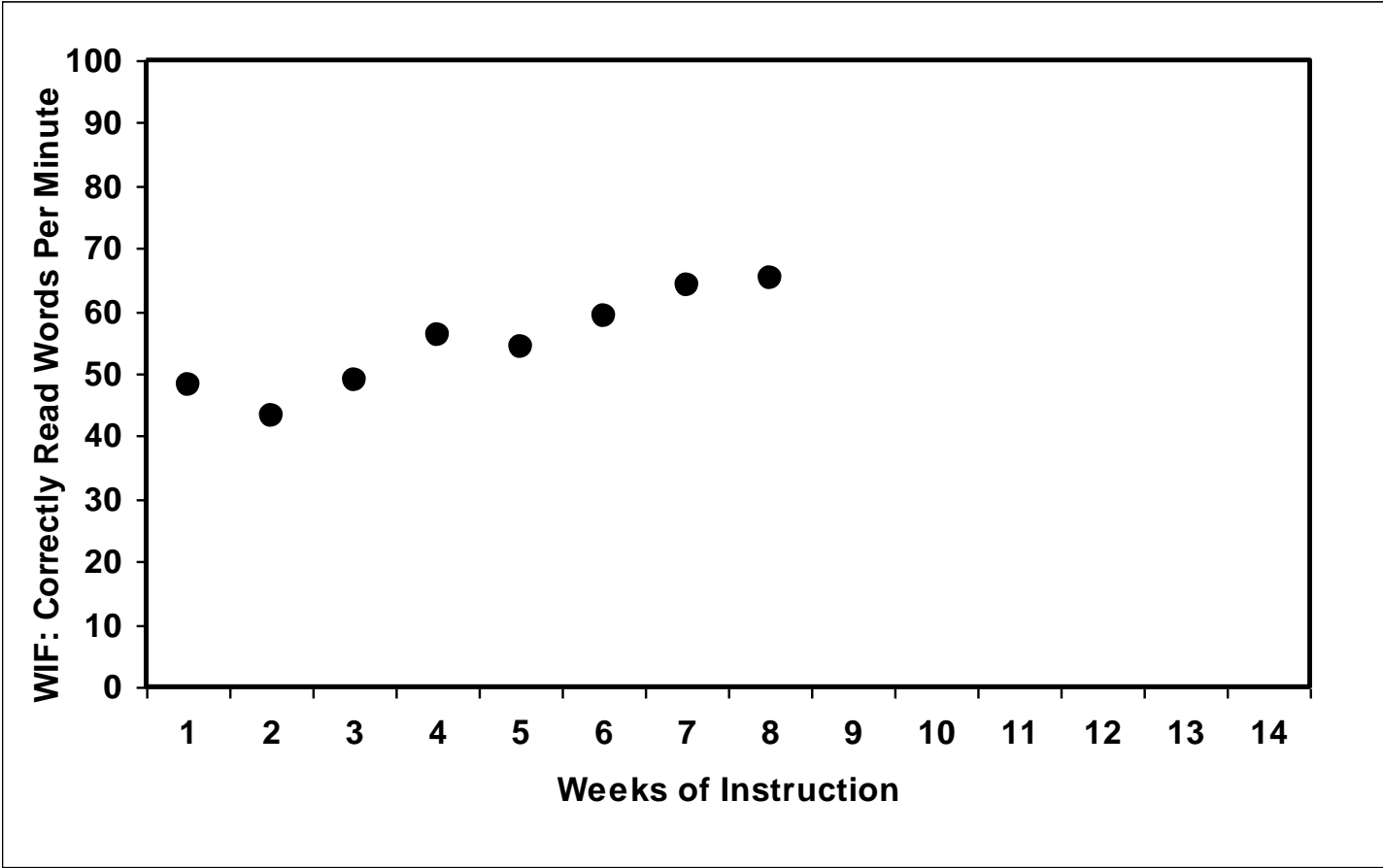
- Tukey method (cont.)
 - In the first and third groups:
 - Find median data point and the median date
 - Mark the intersection of these two with “X”
 - Draw a line connecting the first group “X” and third group “X”
 - This line is the trend-line



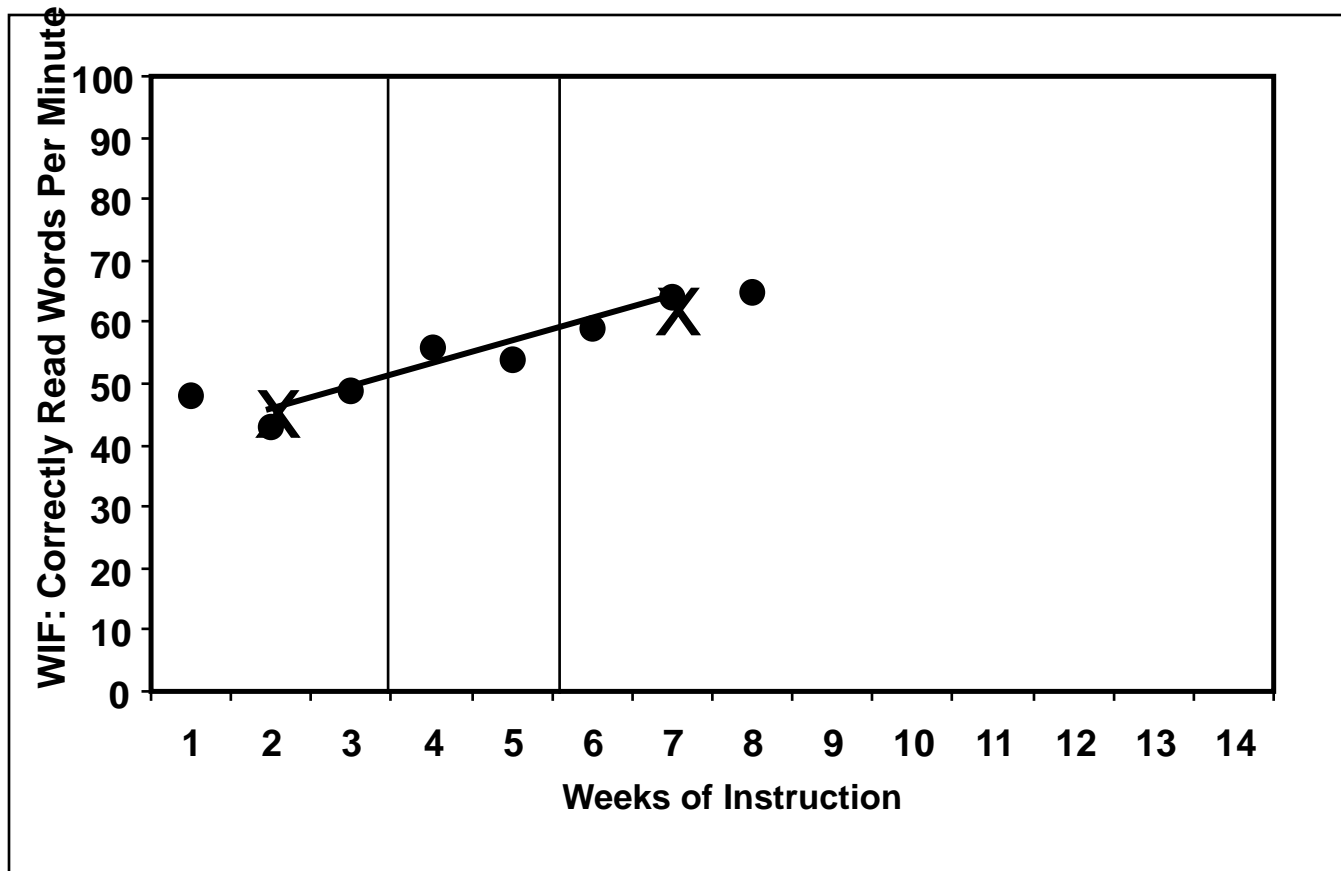
STEP 5: HOW TO SET AMBITIOUS GOALS



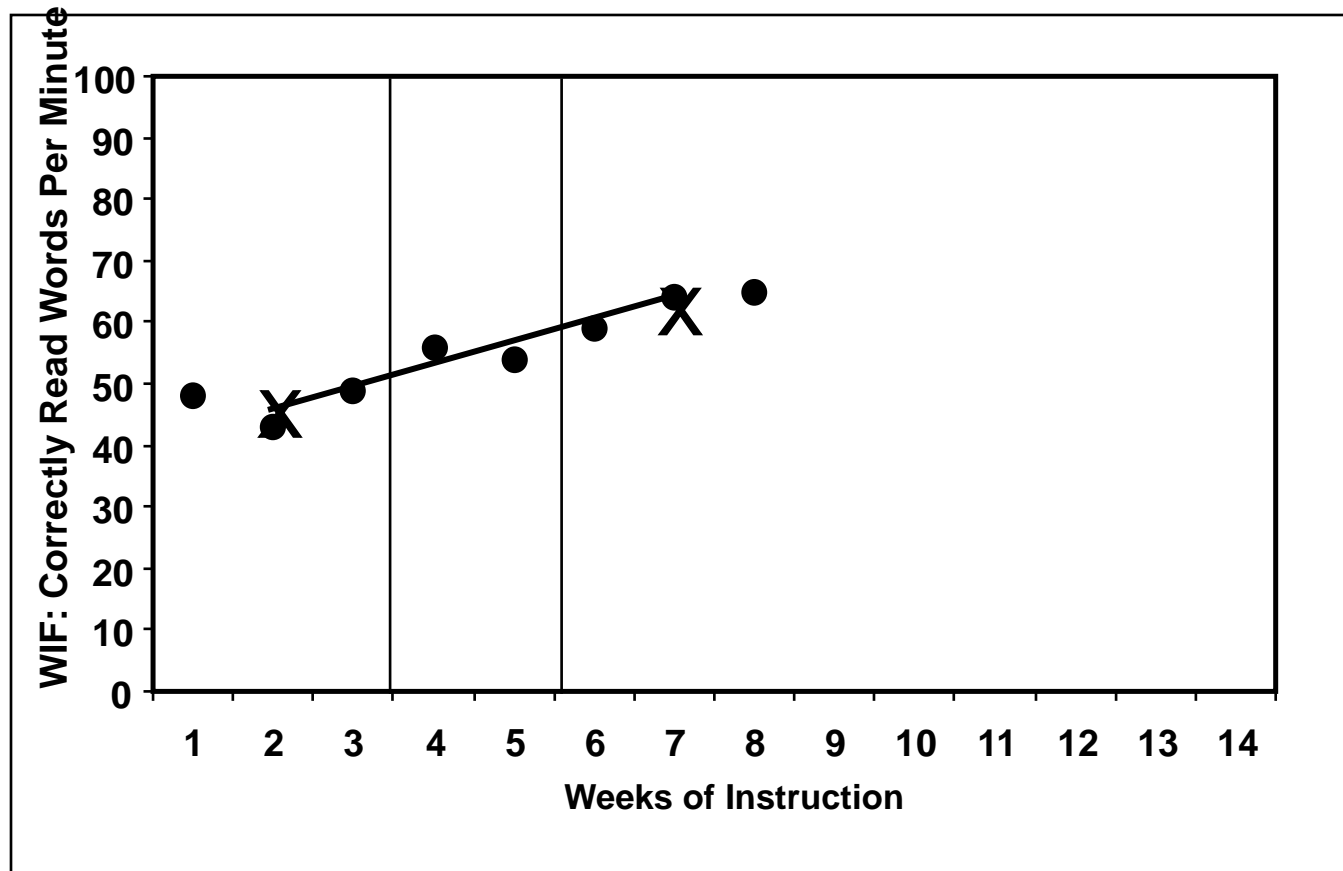
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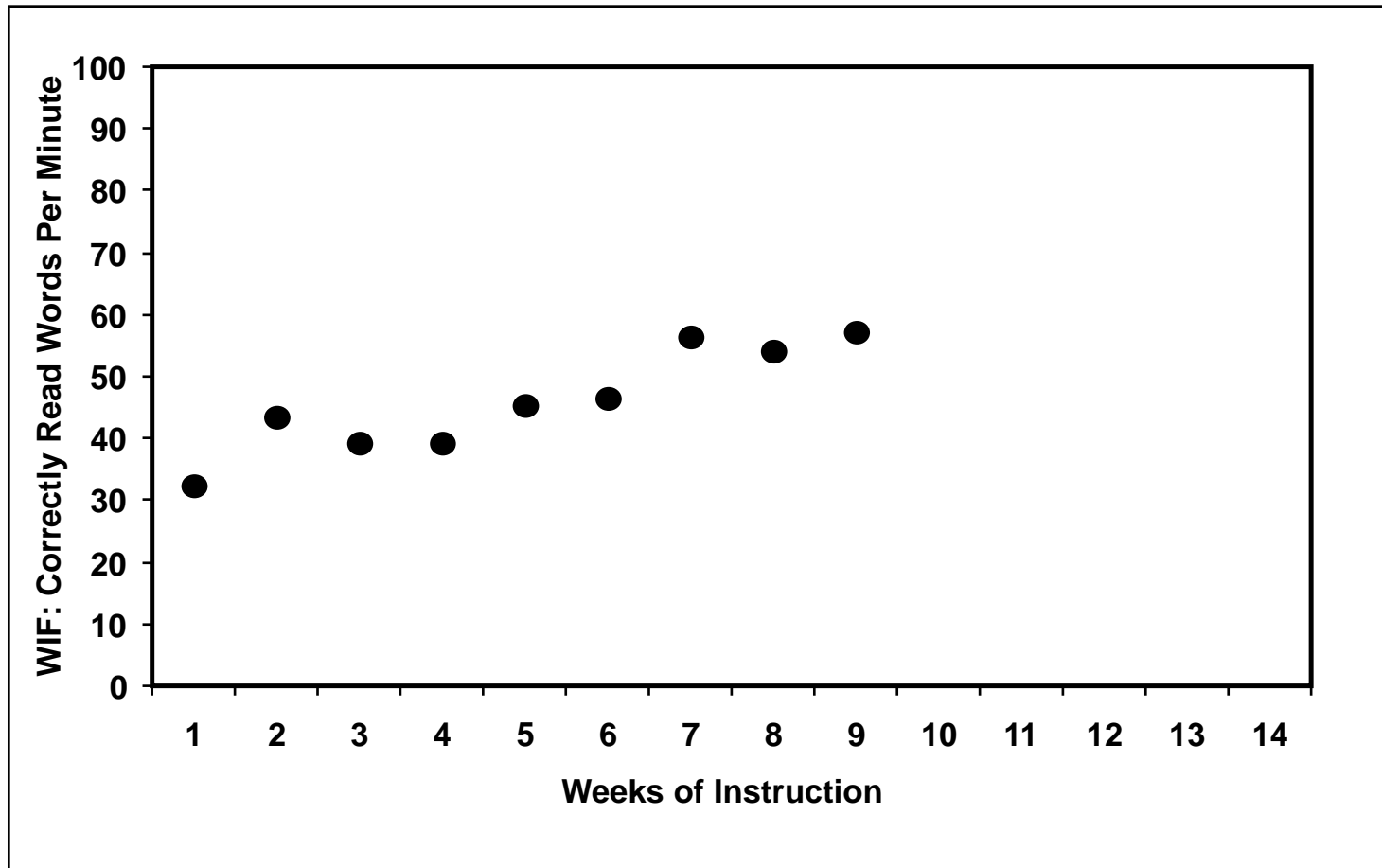
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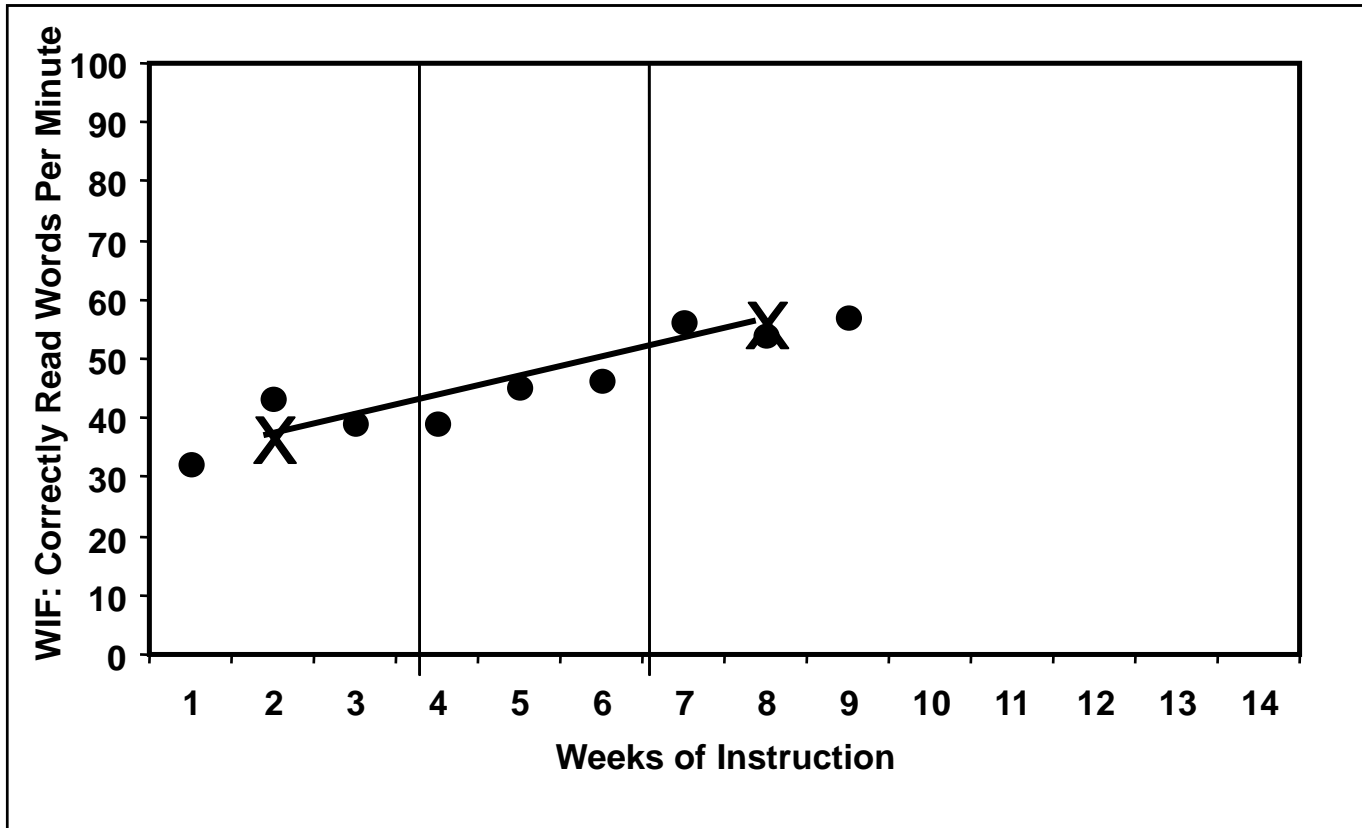
STEP 5: HOW TO SET AMBITIOUS GOALS



STEP 5: HOW TO SET AMBITIOUS GOALS



STEP 5: HOW TO SET AMBITIOUS GOALS



STEP 5: HOW TO SET AMBITIOUS GOALS

- CBM computer management programs are available
- Programs create graphs and aid teachers with performance goals and instructional decisions
- Various types available for varying fees



STEP 6: HOW TO APPLY DECISION RULES TO GRAPHED SCORES

- After trend-lines have been drawn, teachers use graphs to evaluate student progress and formulate instructional decisions
- Standard decision rules help with this process

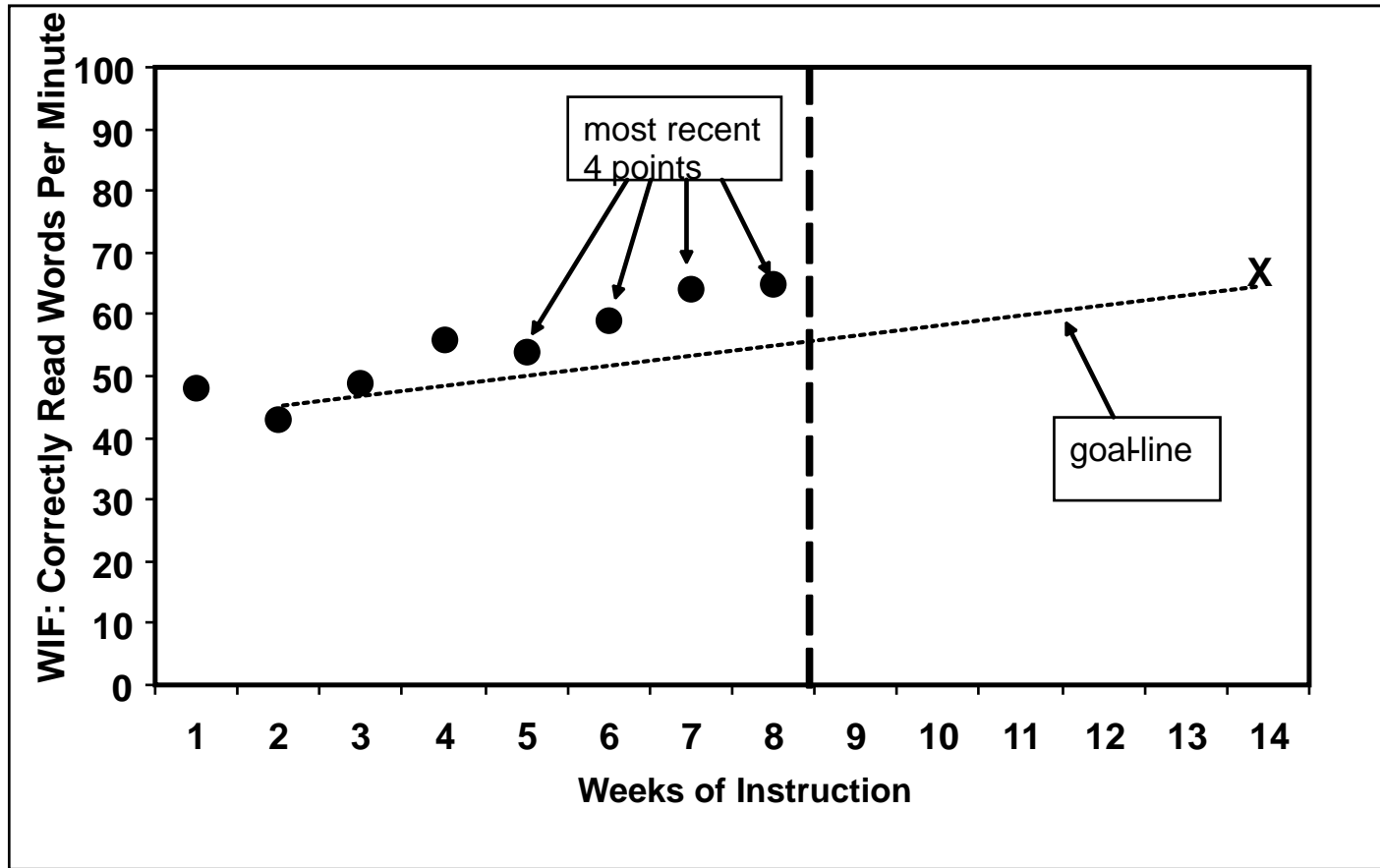


STEP 6: HOW TO APPLY DECISION RULES TO GRAPHED SCORES

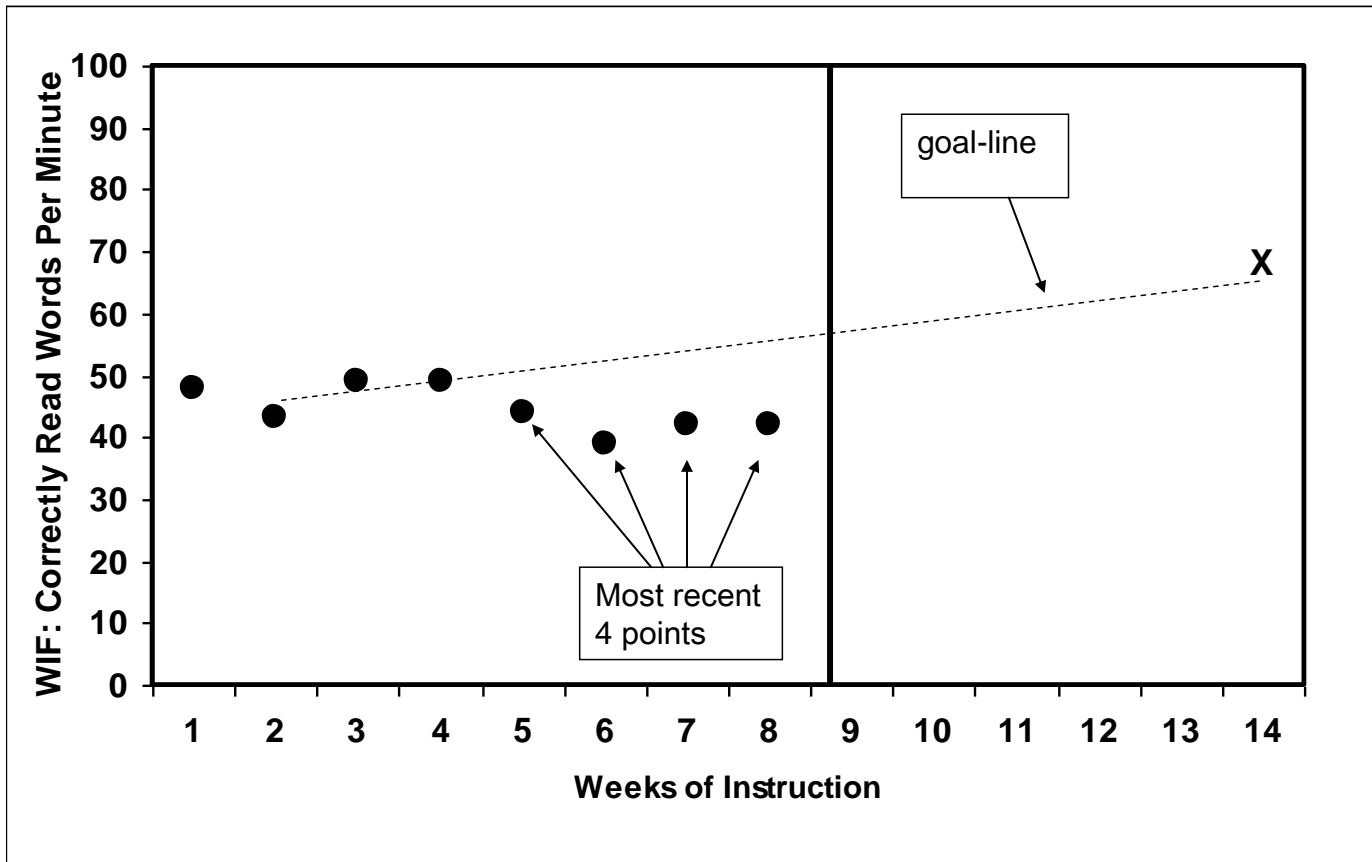
- Based on 4 most recent consecutive scores:
 - If scores are above goal-line, end-of-year performance goal needs to be increased
 - If scores are below goal-line, student instructional program needs to be revised



STEP 6: HOW TO APPLY DECISION RULES TO GRAPHED SCORES



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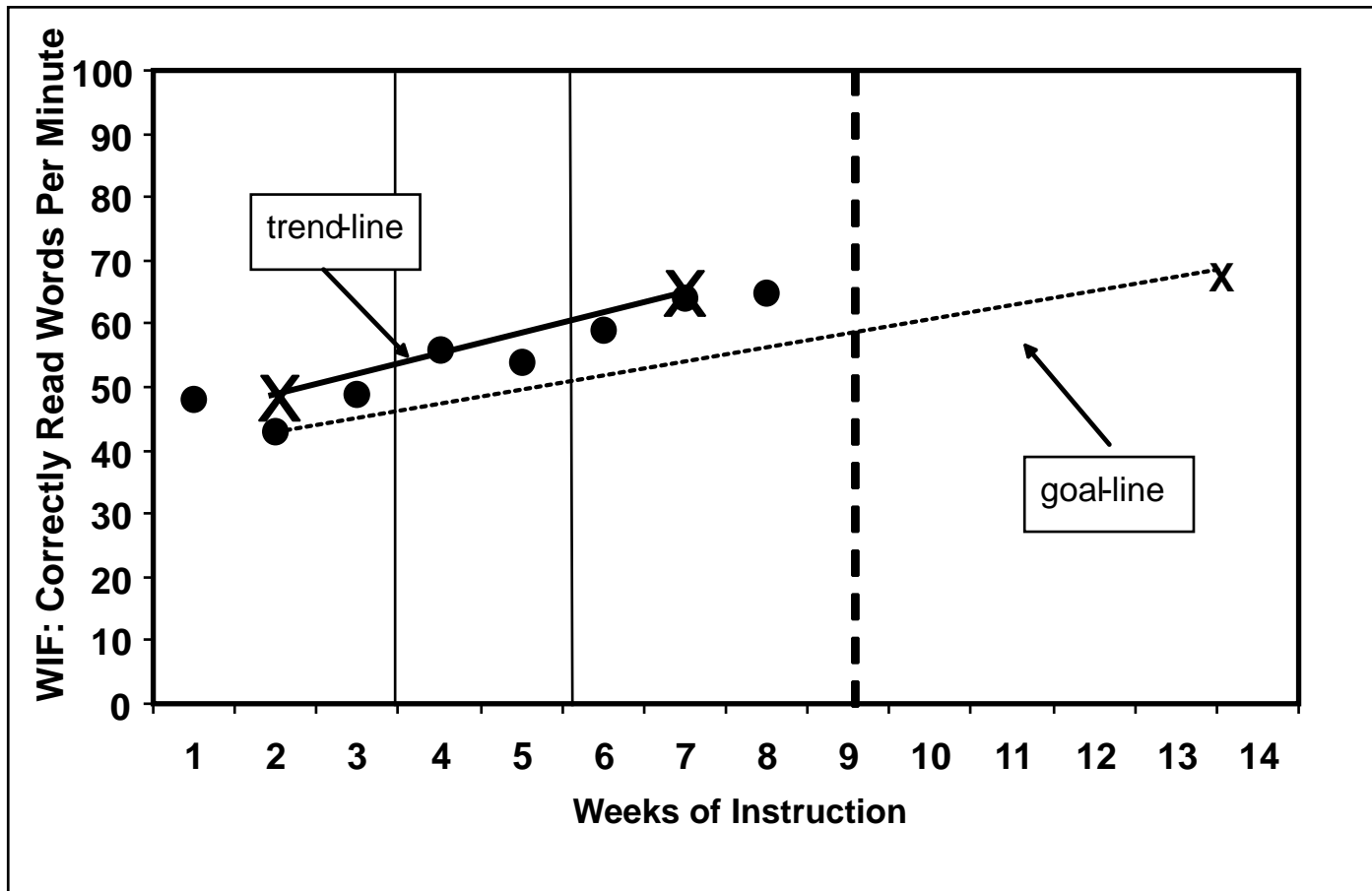


STEP 6: HOW TO APPLY DECISION RULES TO GRAPHED SCORES

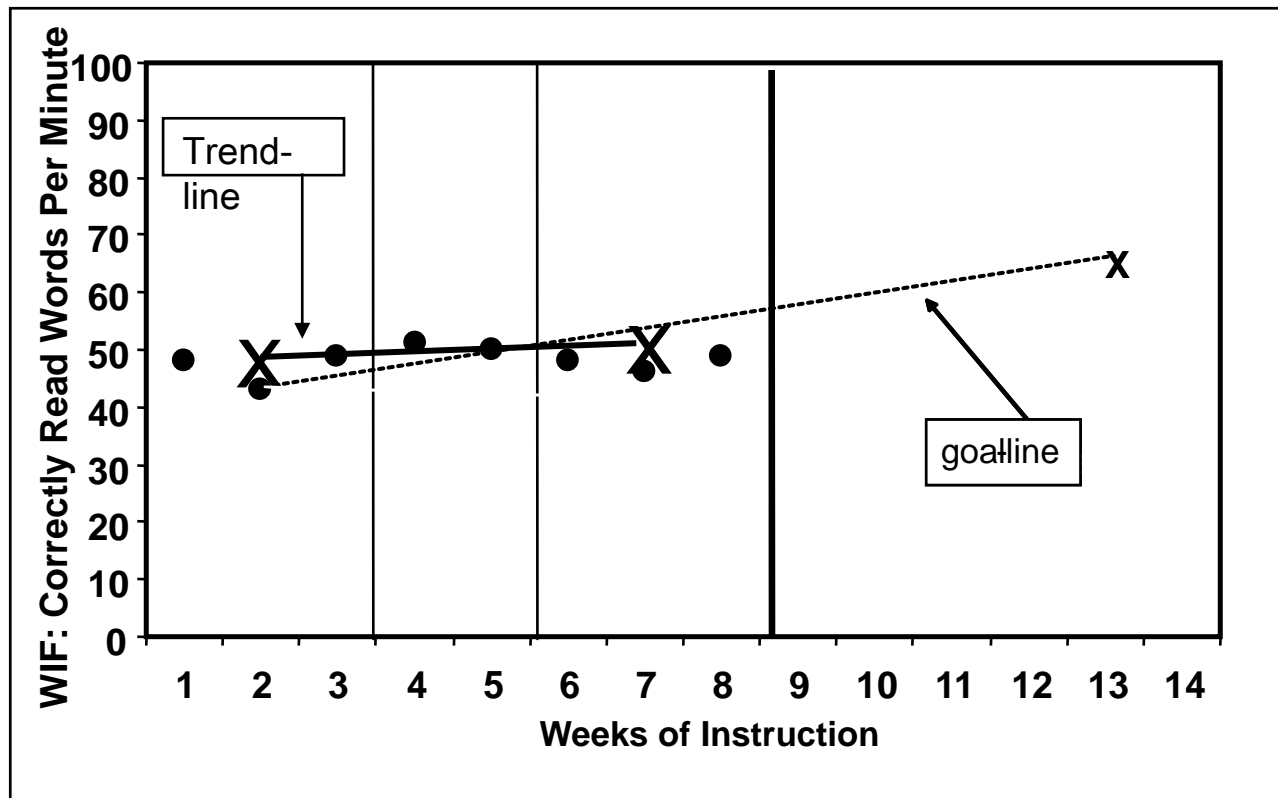
- Based on the student's trend-line:
 - If trend-line is steeper than goal-line, end-of-year performance goal needs to be increased
 - If trend-line is flatter than goal-line, student's instructional program needs to be revised
 - If trend-line and goal-line are fairly equal, no changes need to be made



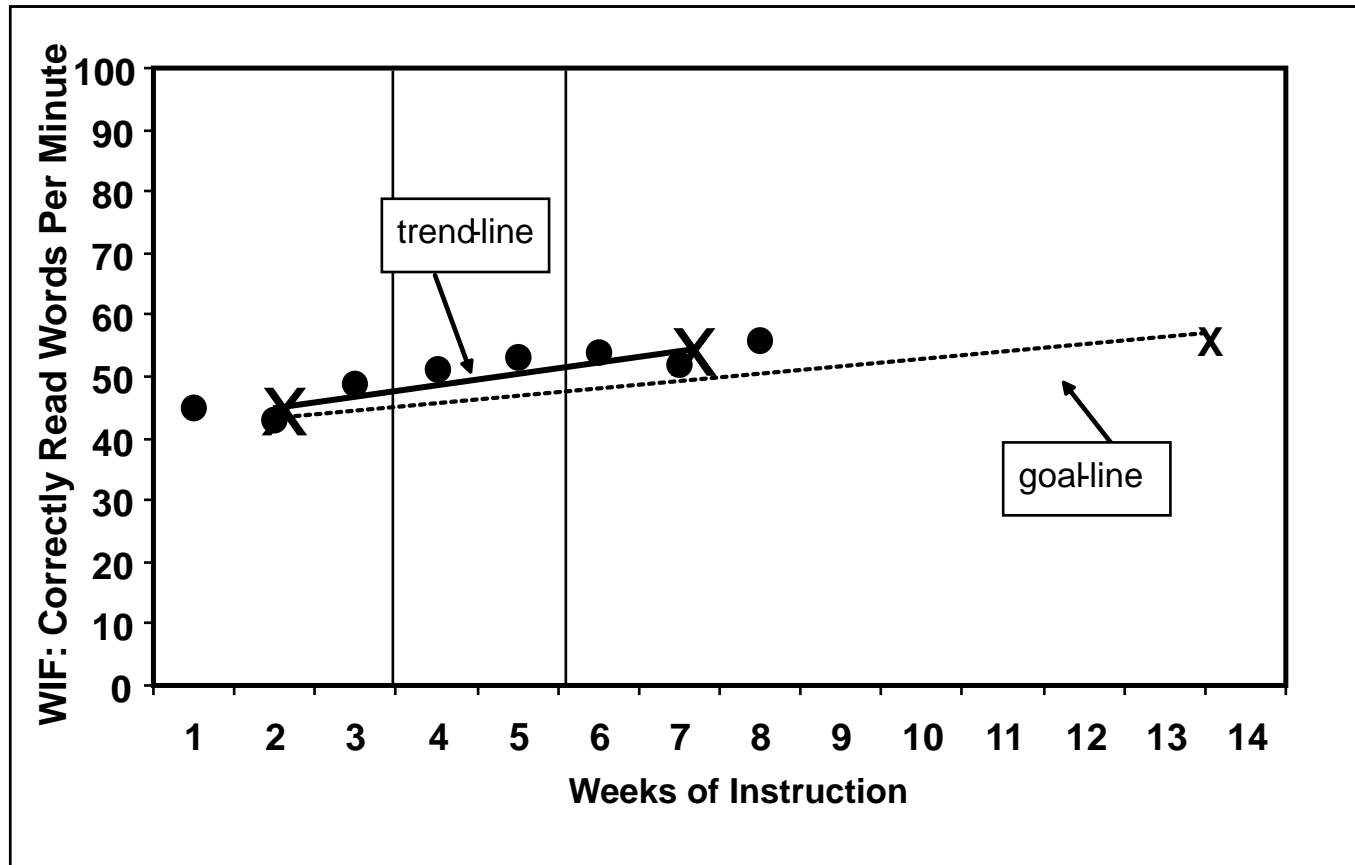
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STEP 7: HOW TO USE DATA TO DESCRIBE STUDENT STRENGTHS AND WEAKNESSES

- Using CBM PRF, student miscues may be analyzed to describe possible student strengths and weaknesses
- Student reads a CBM PRF passage and teacher writes down student errors
- First 10 errors are analyzed using a Quick Miscue Analysis Table



STEP 7: HOW TO USE DATA TO DESCRIBE STUDENT STRENGTHS AND WEAKNESSES

	Written Word	Spoken Word	Graphophonetic	Syntax	Semantic
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
			%		



STEP 7: HOW TO USE DATA TO DESCRIBE STUDENT STRENGTHS AND WEAKNESSES

Adventure on Highway 66

A snowstorm can be exciting ^{extra} . But too much snow ^{now} can cause	11
trains trouble . I learned ^{listened} this in a way I will never forget.	22
My name is John Hearon. I'm a bus driver ^{door} . At five o'clock one	35
morning I turned my bus onto Highway 66. It was snowing ^{snake} . But I was	49
used to driving ^{dumping} in all kinds of weather. Maybe this storm wouldn't last	62
long.	63
As I drove, I counted my passengers ^{pencils} . There were 14 – nine men,	75
four women and a little two-year-old boy ^{baby} . It was so early ^{ear} that most of	91
them were still ^{was stand} asleep. No one seemed to worry ^{word} about the storm.	103
But after an hour or two, I felt the wind getting stronger ^{straight} . The bus	117
swayed from side to side. It was snowing harder ^{happy} , and I had to drive more	132
and more slowly ^{ly} . I wished I had never started out. I didn't like the look of	148
things.	149



STEP 7: HOW TO USE DATA TO DESCRIBE STUDENT STRENGTHS AND WEAKNESSES

	Written Word	Spoken Word	Graphophonetic	Syntax	Semantic	
1	exciting	extra	yes - first part	yes	no	
2	snow	now	yes - except <u>s</u>	yes	yes	
3	trouble	trains	yes - first part	yes	no	
4	learned	listened	yes - first and end	yes	no	
5	forget	figure	yes - first and middle	yes	no	
6	driver	door	yes - first and last	yes	no	
7	snowing	snake	yes - first part	no	no	
8	driving	dumping	yes - first and end	yes	no	
9	passengers	pencils	yes - first and last	yes	no	
10	boy	baby	yes - first and last	yes	yes	
			%	100%	90%	20%



STEP 7: HOW TO USE DATA TO DESCRIBE STUDENT STRENGTHS AND WEAKNESSES

Adventure on Highway 66

A snowstorm can ^{could} be exciting. But too ^{that} much snow can ^{could} cause	11
trouble. I learned this ^{it} in a way I will never forget.	22
My name is John Hearon. I am ^{am} a bus driver. At five o'clock one	35
morning I turned my ^{the} bus onto Highway 66. It was snowing. But I was	49
used to driving in ^{at} all kinds of weather. Maybe this storm wouldn't last	62
long.	63
As ^{while} I drove, I counted my passengers. There were ^{was} 14 – nine men,	75
four women and a little two-year-old boy. It was so early that most of ^{they}	91
them were still asleep. No one seemed to worry about the storm.	103
But after an hour or two, I felt the ^a wind getting stronger. The ^{That} bus	117
swayed from side to side. It was snowing harder, and I had to drive more	132
and more slowly. I wished I had never started out. I didn't like the look of	148
things.	149

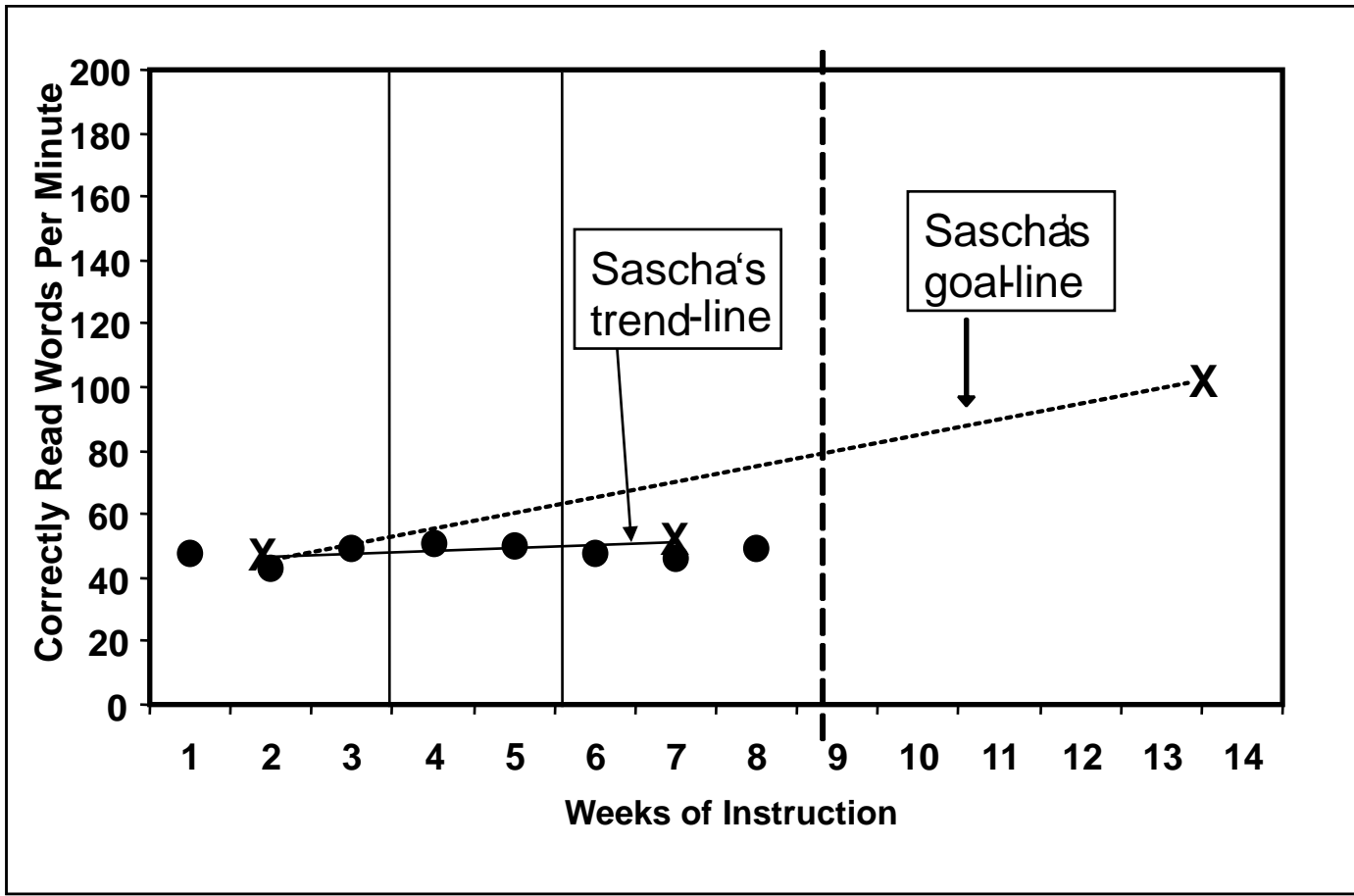


STEP 7: HOW TO USE DATA TO DESCRIBE STUDENT STRENGTHS AND WEAKNESSES

	Written Word	Spoken Word	Graphophonetic	Syntax	Semantic
1	can	could	yes-first letter only	yes	yes
2	too	that	yes-first letter only	yes	yes
3	can	could	yes-first letter only	yes	yes
4	this	it	no	yes	yes
5	I'm	I am	yes	yes	yes
6	my	the	no	yes	yes
7	in	at	no	yes	no
8	As	While	no	yes	yes
9	were	was	yes-first letter only	yes	yes
10	most of them	they	no	yes	yes
			%	50%	100%
				100%	90%



CASE STUDY: SASCHA



CASE STUDY: SASCHA

Lars was a big dragon ^{doggie} . He was green and had red	11
eyes. He shot long flames ^{log flies} from his mouth ^{month} . The grass	21
around ^{round} his cave was scored ^{scratched} .	26
Lars was the meanest dragon ^{doggie} in the land. He	35
scared ^{scratched} the people in the village ^{villain} . At night the people	45
would look up to ^{at} Lar's cave. They saw the mighty	55
flames he breathed. He blew the smoke down to the	65
village. Often the people could not breathe. The	73
smoke was too thick.	77



CASE STUDY: SASCHA

Quick Miscue Analysis

	Written Word	Spoken Word	Grapho-Phonetic	Syntax	Semantics
1.	dragon	doggie	yes - d & g	yes	no
2.	long	log	yes - first & last	no	no
3.	flames	flies	yes - first & last	yes	yes
4.	mouth	month	yes - first & last	yes	no
5.	around	round	yes - all letters except 'a'	yes	yes
6.	scorched	scratched	yes - first & last	yes	no
7.	dragon	doggie	yes - d & g	yes	no
8.	scared	scratched	yes - first & last	yes	no
9.	village	villain	yes - first	yes	no
10.	to	at	no	yes	yes
			% 90%	90%	30%

