Practical, Research-Based Techniques for Teaching Students with Intellectual Disabilities to Read

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Overview of Project Maximize: Project Staff

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Overview of Session

- Research Study

- Overview of Curriculum

- Literacy Strands
  - Oral Language/ Vocabulary
  - Phonemic Awareness
  - Phonics/Word Recognition
  - Fluency
  - Comprehension

✓ How to Teach

✓ IEP Examples

✓ Student Examples
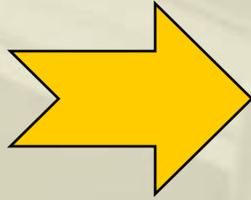
Overview of Project Maximize: Purpose

Determine if a ***comprehensive***, phonics-based, direct instruction ***reading program*** would be effective in teaching early reading and language skills to ***students with IQs ranging from 40-79***

Overview of Project Maximize: Design

- Longitudinal – 4 years (05-06 through 08-09)
- Random assignment to intervention or contrast group
  - Within school
  - Within IQ range (40-54; 55-69; 70-79)
- Students in Grades 1-4 when they began the study

Current Participants (08-09)

note: 186 different students participated at least one year; 3rd -6th grade in 08-09	Treatment	Contrast
Borderline IQ (70-79*) *WASI or school testing	$n = 18$	$n = 16$
Mild IQ (55-69)	$n = 18$	$n = 15$
Moderate IQ (40-54)	$n = 18$	$n = 11$
TOTAL	$n = 56$	$n = 42$

Literature Review: Reading and Intellectual Disabilities (ID)

- Minimal amount of research
- Focused on mild ID, not moderate ID
- Focused on isolated subskills
  - Even students with moderate to severe levels of ID can learn to automatically recognize a fairly large number of words (sight words)
  - Phonics research is promising

Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006; Conners, Rosenquist, Sligh, Atwell, & Kiser, 2006

Literature Review: Reading and Intellectual Disabilities (ID)

No research has been conducted to determine whether students with ID can learn to read by fully processing the print and meaning of connected text, as is consistent with current theories of reading development

Research Questions

Do students with IQs between 40 and 69…

1. …make significant progress on a variety of standardized measures of reading-related variables?

2. …who participate in a comprehensive reading intervention outperform similar peers receiving typical special education instruction?

Design and Participants

- Longitudinal – 2 to 3 academic years (05-06 through 07-08)
- *Random assignment* to *intervention* or *contrast* group, within each of the 10 schools
- Grades 1-4 when they began the study
- IQs ranged from 40-69
- treatment, $n = 34$; contrast, $n = 25$
- Intervention ranged from 46 to 106 weeks (mean = 79.54; $SD = 15.37$)

Intervention: Components

- Early Interventions in Reading (EIR)
  - Foundation, Level 1*, Level 2*
  - *published by SRA/McGraw-Hill
- Supplemental language instruction
- Supplemental home-school connection materials
- Instructional Sessions
  - Daily by research teachers for 40-50 minutes
  - Taught in groups of 1-4

Curriculum: *Early Interventions in Reading*

- "Foundation" Level (60 Lessons)
  - Skills typically taught in kindergarten
  - in press
- Level One (120 Lessons)
  - Skills typically taught in first grade
  - Published
- Level Two (120 Lessons)
  - Skills typically taught in second-third grades
  - Recently published

Students began in either "Foundation" or Level One

Curriculum: Critical Features

- Explicit and Systematic
  - Explicit strategies
  - Cumulative review
  - Careful sequencing
- Phonics-based
- Fast-paced
- Immediate Feedback
- Teaching to Mastery
  - Lessons or lesson components repeated, as needed
- Increased Opportunities to Respond

Overview of Instructional Strands Content

	Foundation	Level 1[ab]	Level 2 [b]
Phonological Awareness	Phonological Awareness	Phonemic Blending Phonemic Segmenting	
Word Recognition/ Phonics	Letter Names	"Tricky" Words (Irregular)	
		Letter-Sound Correspondences	
		Sounding Out Strategy	Flexible Decoding
		"Stretch and Spell" (links PA segmentation to print)	
		Syllable Types	
Vocabulary	Common "Tier I" Words Linked to Text	"Tier II" Words – Direct Instruction; Linked to Text	
			"Tier III" Words – Expository/Narrative
Fluency	Cumulative Review of Word Recognition Skills		
		Word-Level Fluency	
		Passage Fluency	
Comprehension	Listening Comprehension		
		Simple Strategies	More Complex Strategies

[a] Level 1 supplemented with additional Language Component   [b] Published by SRA

Activity 4
Sounding Out

(Have students turn to page 26 of **Activity Book A.**)

(Hold continuous sounds for about 2 seconds, but quickly move off stop sounds. There should be no pauses between sounds when sounding out.)

Now you're going to sound out words on your own. Point to each sound when I tap, and say the sound until I tap again. Do not stop between sounds. You will hum the word. Then you will read the word.

(Demonstrate by placing your finger next to the word in, and say:) **Place your finger under the /iii/ sound.** *(Monitor.)* **When I tap, you say the first sound.** *(Tap.)* **/iii/**

(Wait 2 seconds, and tap again for the /nnn/ sound. Be sure students hold the sound until you tap again.)

Read it fast. in

Good job sounding out by yourselves. Let's continue!

> **Repeat the process with the following words: am, ram, fan, rim, man.**

Individual Practice

(Provide individual practice.)

You are sounding out and reading words! Excellent! I'll put a check mark on the Mastery Sheet.

Activity 5
Stretch and Spell

(Direct students to the correct section of the activity sheet.)

Now I will say a word, and you will spell it. First, I will say the word fast. Then, you will stretch it.

Listen for each sound as you stretch it. Then write the letters for each sound in the order you heard them.

First word. Fists up.
Stretch and. /aaa/nnn/d/

(Hold up one finger for each sound as you stretch the word.)

Write each sound in the order you heard it. Stretch the word in your head while you write it. And.

(Monitor to see if each student writes the letters in the correct order.)

Read the word you spelled. and
Excellent stretching and spelling! Next word.

> **Repeat the process with the following words: in, act, raft, rat, mint.**

(Scaffold as necessary.)

Good job stretching and spelling. We have finished this activity, and I am going to put a check mark on the Mastery Sheet.

Activity 6
What Word Now? Game

(Use the marker board for this game. Begin by writing the word it on the board.)

Note: *Use the following format to play this game:*

1. *Sound it out.*
2. *Read it fast.*
3. *Change 1 phoneme.*
4. *Sound it out.*
5. *Ask students, "What word now?"*

We are going to play the game called What Word Now?
*(Point to it, and say:)* **Sound the word out. /iii/t/**
Read the word fast. it

(Add f to it, and say:) **Now I'll change the word.** *(Point to fit, and say:)* **Sound it out. /fff/iii/t/**
What word now? fit

Results: RQ #1 (progress across time regardless of treatment)

- Main effects for time were significant on all measures ($p < .001$; F values ranged from 16.48 to 66.08)
- Summary: On average, participants made educationally meaningful, statistically significant progress on standardized measures of reading and language after 2-3 years of instruction

Phonemic Awareness [a]

Blending Words
ES = .53

Blending Nonwords
ES = .66*

Segmenting Words
ES = .66*
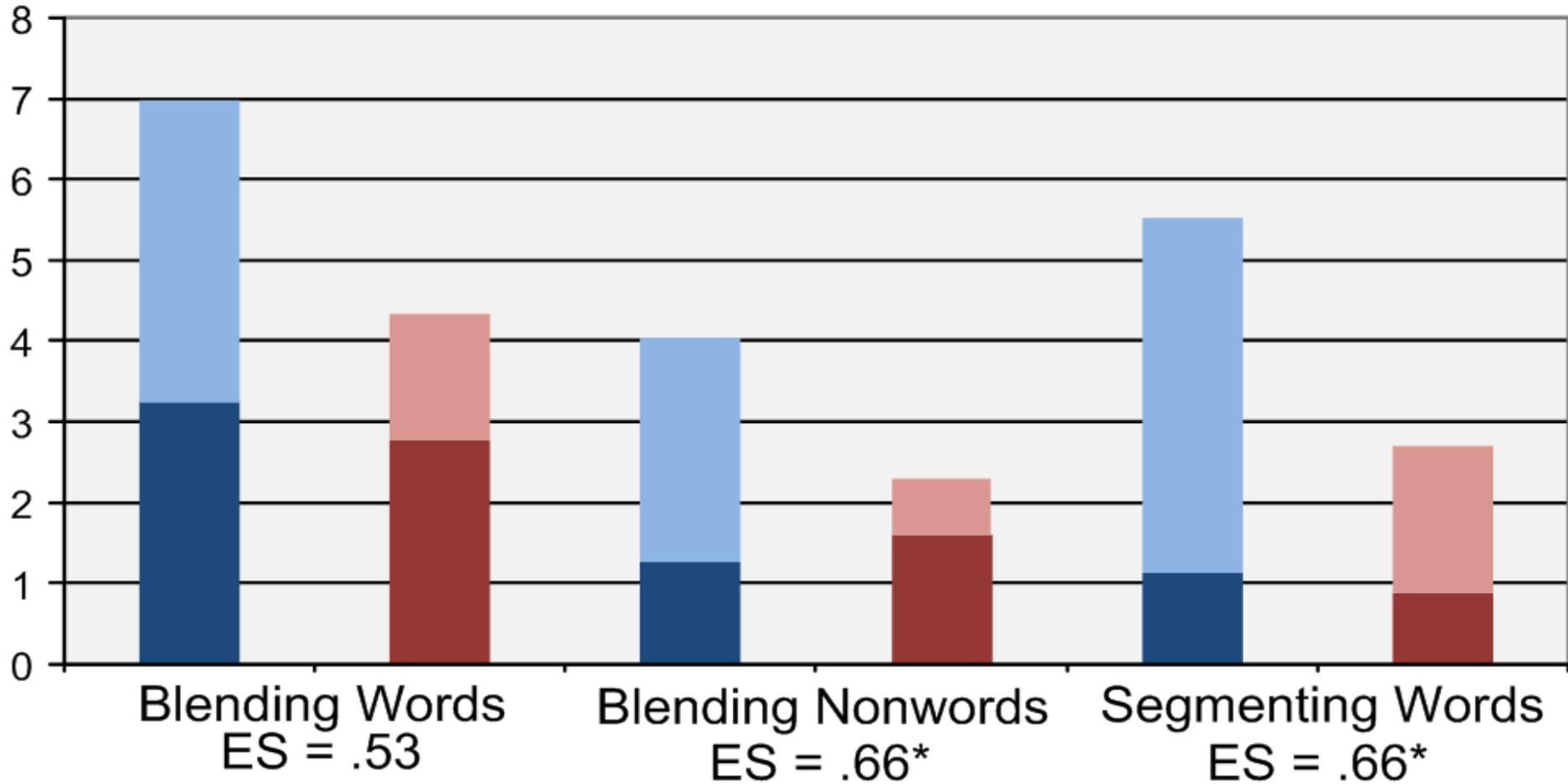
[a]Comprehensive Test of Phonological Processing
*p<.05

Treatment Pretest
Treatment Growth at Posttest
Contrast Pretest
Contrast Growth at Posttest

Results: RQ #2 (impact of treatment)

Reading – Phonemic Decoding

- ANOVA analyses of pre-post measures
  - Statistical significance on 1 of 2 measures (time X treatment); no longer significant after Bonferroni correction
 - Effect sizes .58,.49
- HLM analyses of NWF
  - Best modeled as having quadratic change and an interaction effect between this change and trmt
  - Predicted value of score of avg child after 105 weeks of instruction was 55.49 (contrast, 32.73)

Reading – Phonemic Decoding
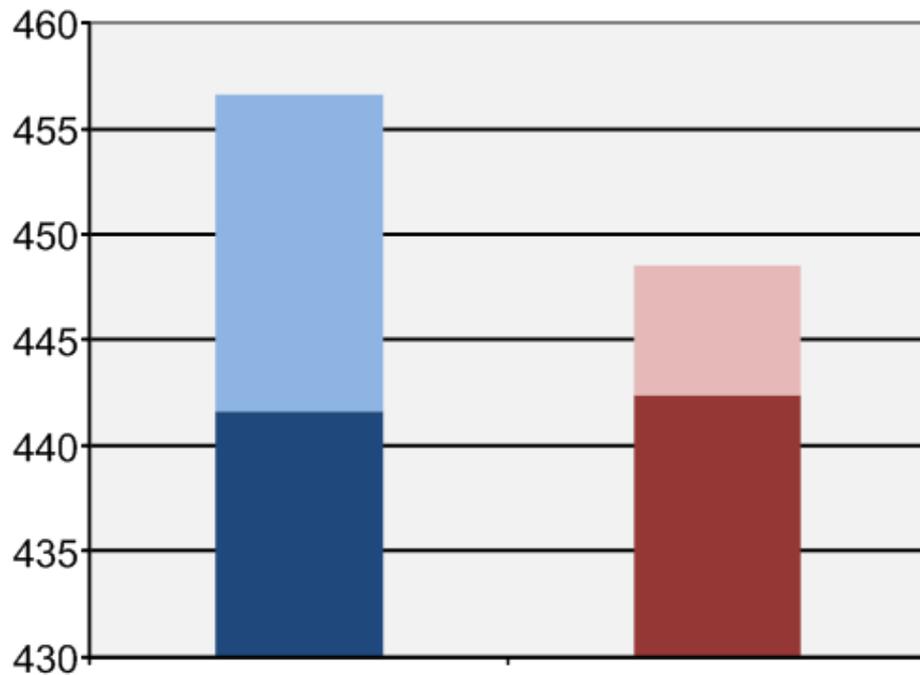
Word Attack[a]
ES = .58*
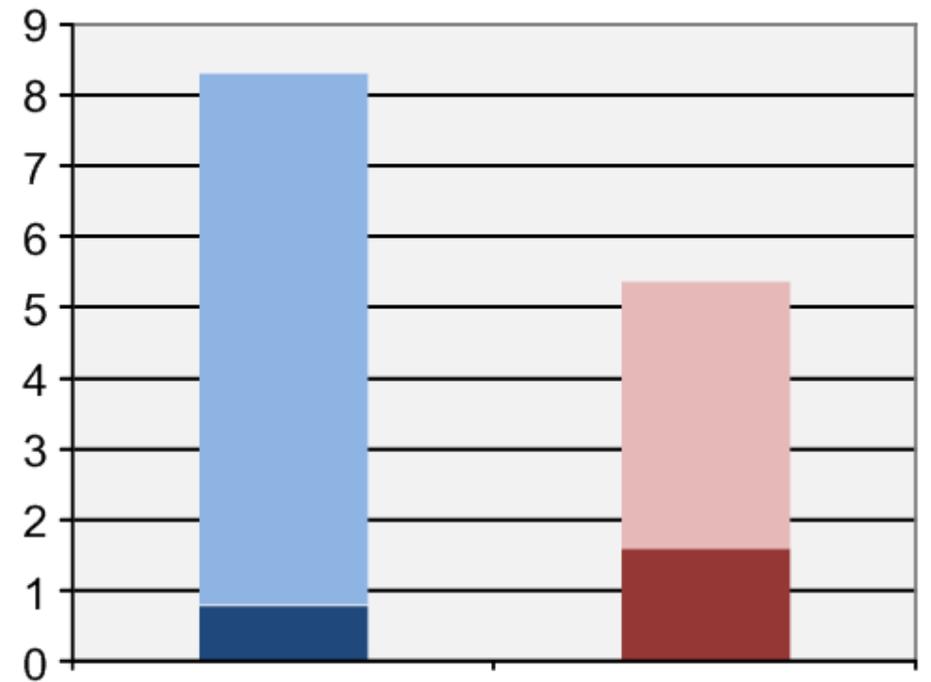
Phonemic Decoding Efficiency [b]
ES = .49

[a]Woodcock Language Proficiency Battery (W-scores)
[b]Test of Word Reading Efficiency
*p<.05

Legend:
- Treatment Pretest
- Treatment Growth at Posttest
- Contrast Pretest
- Contrast Growth at Posttest

Results: RQ #2 (impact of treatment)

Reading – Word Identification

- ANOVA analyses of pre-post measures
  - No statistically significant differences found on either measure
  - Effect sizes .51,.26

Reading – Word Identification
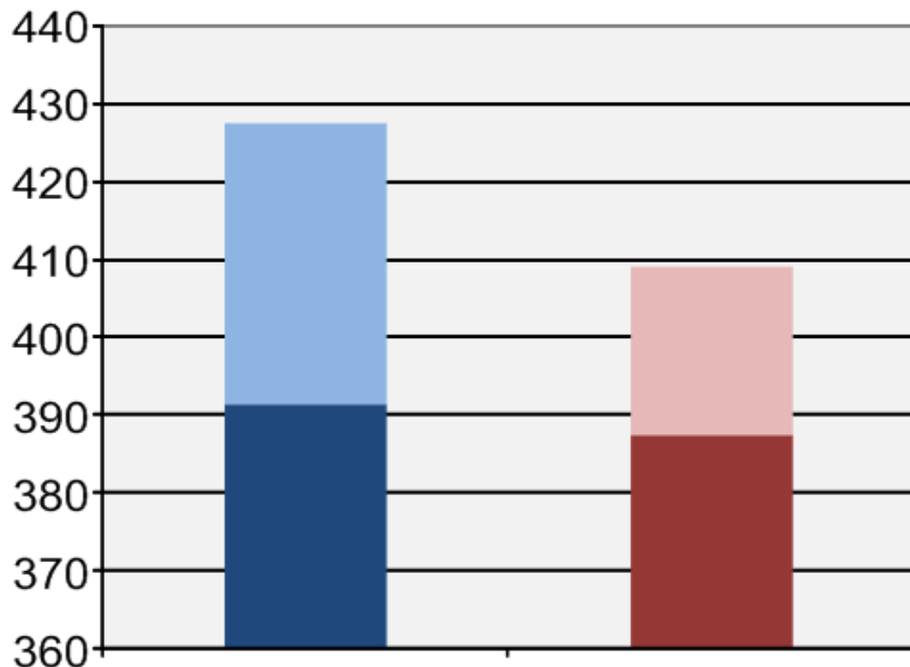
Letter-Word Identification[a]
ES = .51
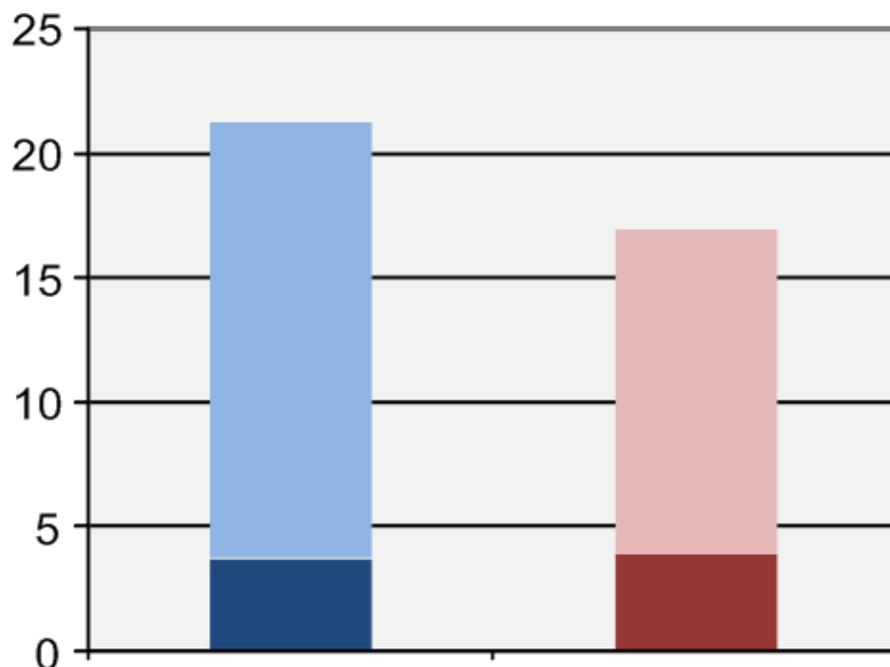
Sight Word Efficiency [b]
ES = .26

[a]Woodcock Language Proficiency Battery (W-scores)
[b]Test of Word Reading Efficiency

Treatment Pretest
Treatment Growth at Posttest
Contrast Pretest
Contrast Growth at Posttest

Results: RQ #2 (impact of treatment)

Reading – Oral Reading Fluency

- HLM analyses of ORF
  - Best modeled as having quadratic change and an interaction effect between this change and trmt
  - Predicted value of score of avg child after 105 weeks of instruction was 44.30 (contrast, 26.67)

Results: RQ #2 (impact of treatment)

Language

- ANOVA analyses of pre-post measures
  - No statistically significant differences
  - Effect sizes .46, .50, .34

Language

expressive vocabulary[a]
ES = .46

receptive vocabulary[b]
ES = .50
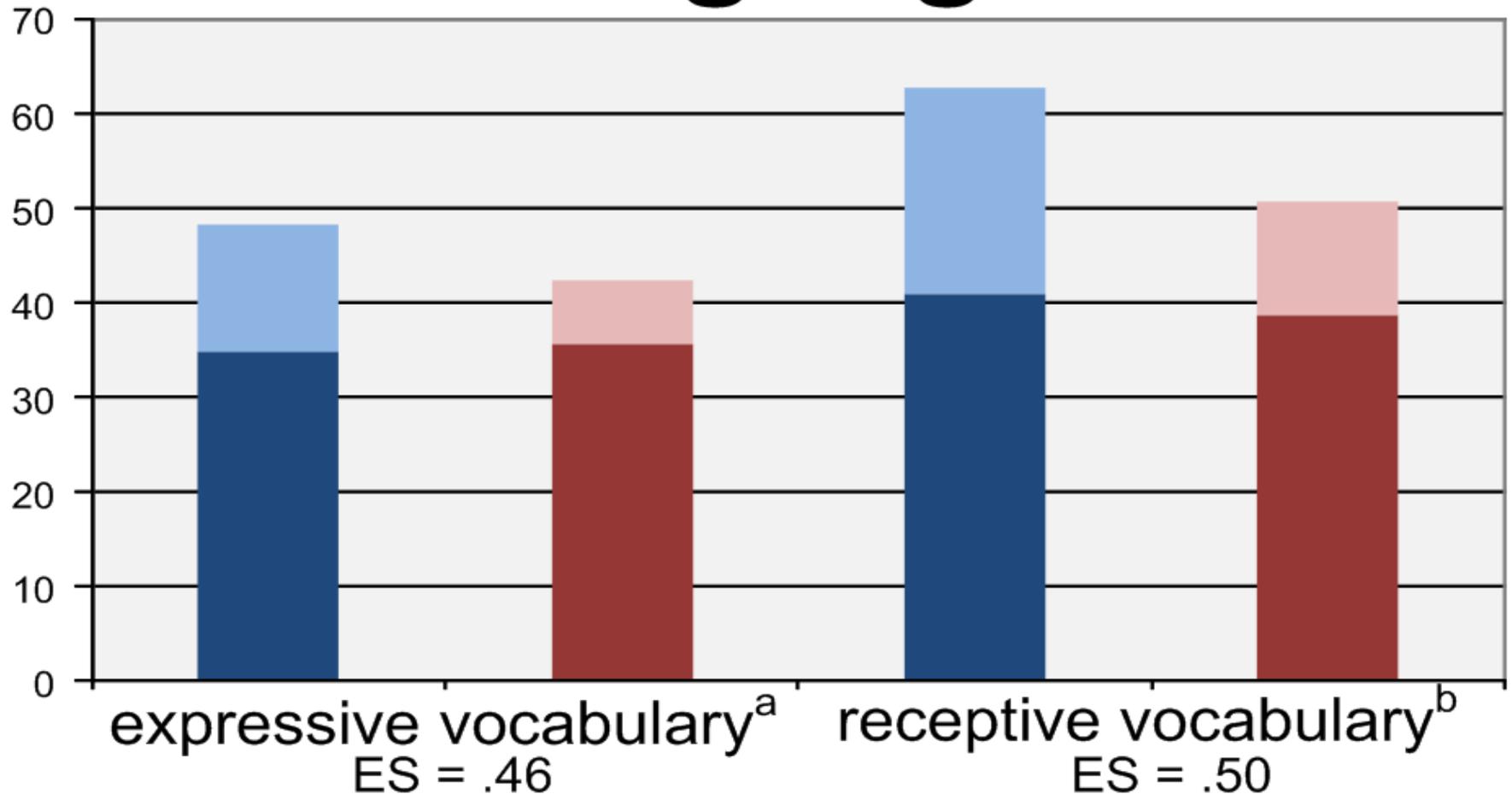
[a]Expressive Vocabulary Test
[b]Peabody Picture Vocabulary Test

■ Treatment Pretest
■ Treatment Growth at Posttest
■ Contrast Pretest
■ Contrast Growth at Posttest

Results: RQ #2 (impact of treatment)

Comprehension

- ANOVA analyses of pre-post measures
  - Negligible differences
  - Not statistically significant and ES = .04

Reading – Comprehension
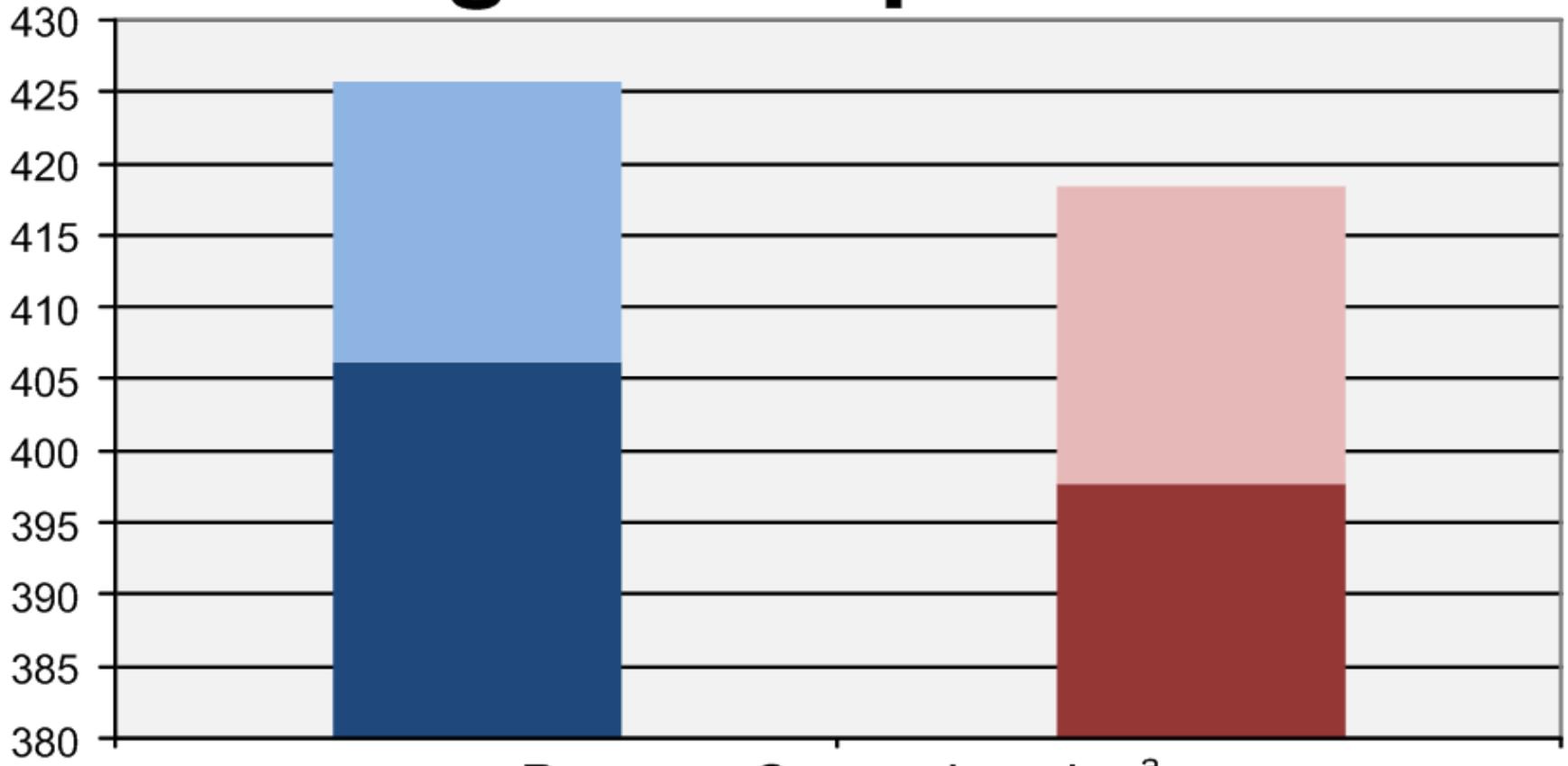
Passage Comprehension[a]
ES = .04

[a]Woodcock Language Proficiency Battery (W-scores)

Legend:
- Treatment Pretest
- Treatment Growth at Posttest
- Contrast Pretest
- Contrast Growth at Posttest

Limitations

- Performance among students highly variable
- Though relatively large sample size for population, it is a relatively small sample size for the statistical methods
- Intervention was complex and comprehensive, making it difficult to determine which parts were causing positive effects
- Large number of measures required to assess outcomes, but increases probability of Type I error

Conclusions

- Support for use of scientifically-based reading instruction for students with low IQs (ID range)
- IF provided intensive, comprehensive instruction over an extended period of time
- Individualized and with high degrees of fidelity

"Jacob"

- Grade: 5th (began study in 2nd grade)
- IQ: 53
- Diagnosis: MR / Williams' Syndrome
- Placement: general education classroom with special education resource/inclusion

Jacob's Story:

- Jacob struggles with language and working memory

- Extremely social child who interacts with everyone in school; advanced social skills often mask his learning differences

- Requires modifications for behavior and instructional issues

- After receiving instruction for three years, Jacob is about three-quarters of the way through Level 1

Modifications used

- Shortened lessons in the beginning to reduce frustration and accommodate short-term memory issues
- Provide student with extra practice on "tricky words" to increase ORF scores
- Teacher uses Velcro board, allowing Jacob to manipulate words and form sentences
- Cumulative review style games and puzzles are sent home to involve parents and provide student with extra practice
- Daily positive reinforcements such as using a marble jar or praise jar to encourage appropriate behavior and participation

Growth in Phonemic Segmentation Fluency for Jacob

Growth in Nonsense Word Fluency for Jacob
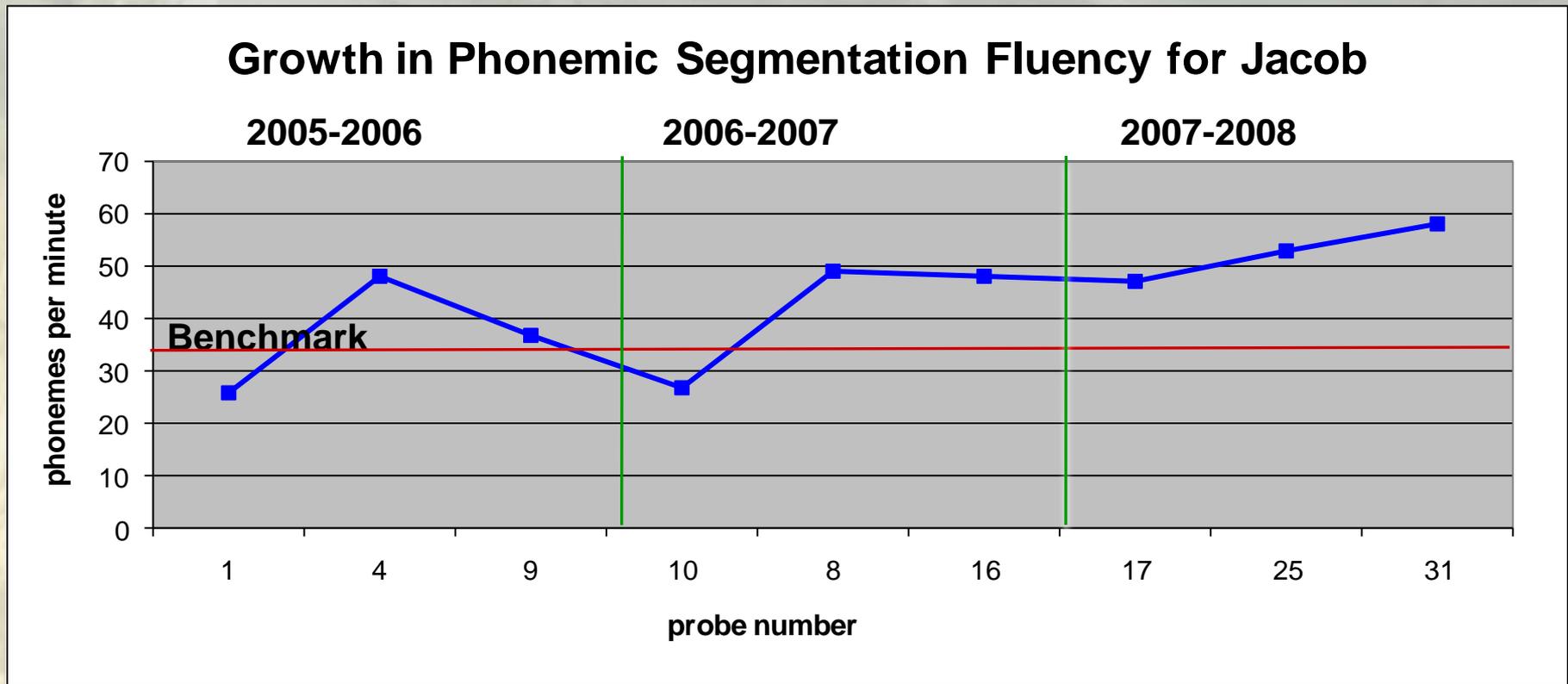
Growth in Nonsense Word Fluency for Jacob
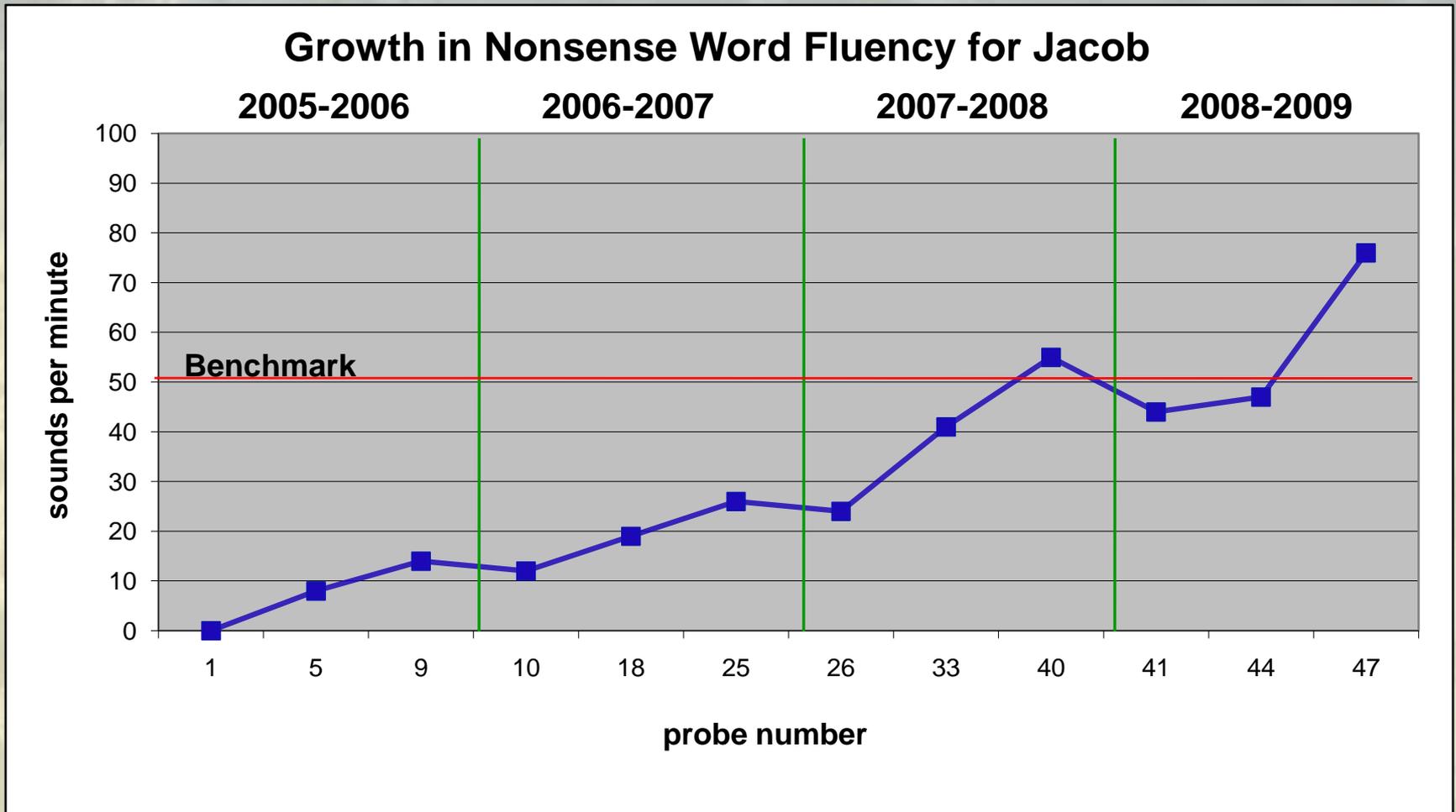
Growth in Oral Reading Fluency for Jacob
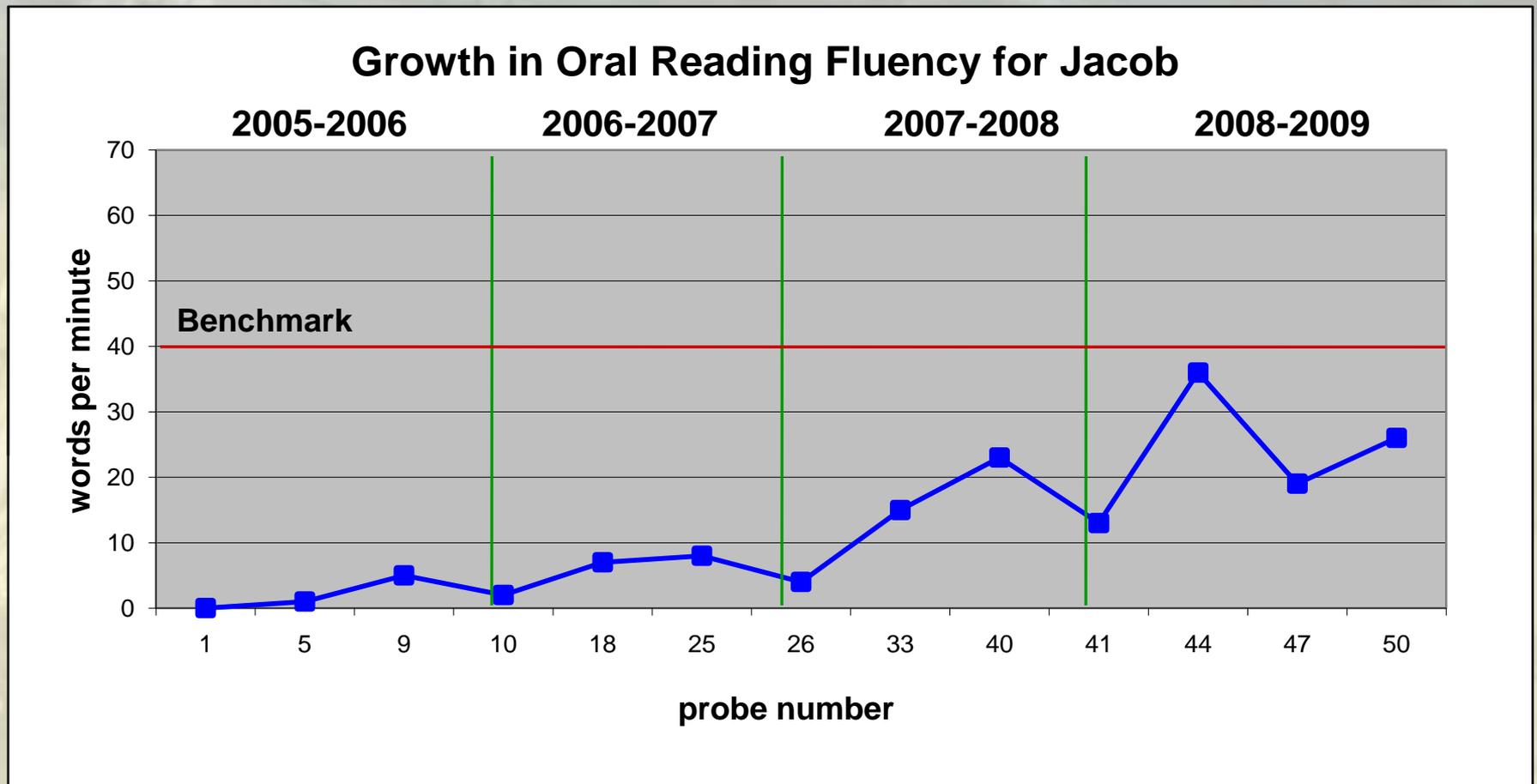
What Can Jacob Read??
Sample Text

"Not me," said Grace. "I like spiders. My sister and I have a spider club."

4

"That is a garden spider," said Grace. "It has eight eyes!"

"It has lots of legs too," said Mike.

"Yes, all spiders have eight legs," said Grace.

5

Techniques for Teaching Oral Language and Vocabulary

- Oral Language – talk, talk, talk
- Vocabulary
  - Short, kid-friendly definitions
  - Real-life applications; thumbs-up/down game
  - Pictures, video and gestures; acting out words
  - Direct teaching of morphographs (prefixes/suffixes/roots)
  - Word Journals

Techniques for Teaching Phonemic Awareness

- Variety of Activities
  - Rhyme Time, First Sound Game, Say the Word (blending), Stretch and Blend, Vowel Discrimination
- Focus on Blending and Segmenting
  - Blending -- teacher says sounds one at a time and child says word
  - Segmenting – teacher says word and child says sounds one at a time
  - TIP: Stretch and Connect

Example IEP Objectives

- Orally blend onset and rime into a word
- Orally blend 2-5 phonemes into a word
- Orally segment words with 2-5 phonemes into individual phonemes

Techniques for Teaching Phonics/Word Recognition

- Letter-Sound Correspondence
- Sounding Out
  - Student led
  - Teacher led
  - Chunking
- Tricky Words (high-frequency sight words)

Example IEP Objectives

- Pronounce short vowel words in which each letter represents its most common sound, including cvc/cvcc/ccvcc patterns (e.g. cat, best, stamp)

- Pronounce high frequency, irregularly spelled sight words (e.g. come, one)

"Bart"

- Grade: 5th
  - (began study in 2nd)
- IQ: 52
- Diagnosis: MR
- Placement: self-contained special education classroom for students with MR

Bart's Story:

- Bart has struggled with behavior; often noncompliant and has had to be restrained on several occasions

- Bart thrives in structured, organized environments where he is able to experience success; chaotic situations cause immediate meltdowns

- Bart has suffered from numerous health problems which have led to multiple surgeries and chronic absenteeism

- As Bart's reading has improved, behavior and attitude have improved

- Bart finished year 3 toward the end of Level 1

Modifications used:

- Work with homeroom teacher on a positive reinforcement system (tokens)
- Daily verbal and written communication with parents
- One-on-one, structured instruction to minimize distractions and foster success
- Cumulative review style games and puzzles are sent home to involve parents and provide student with extra practice
- Use manipulatives to increase comprehension – "Build the Main Idea"

# Growth in Phoneme Segmentation Fluency for Bart
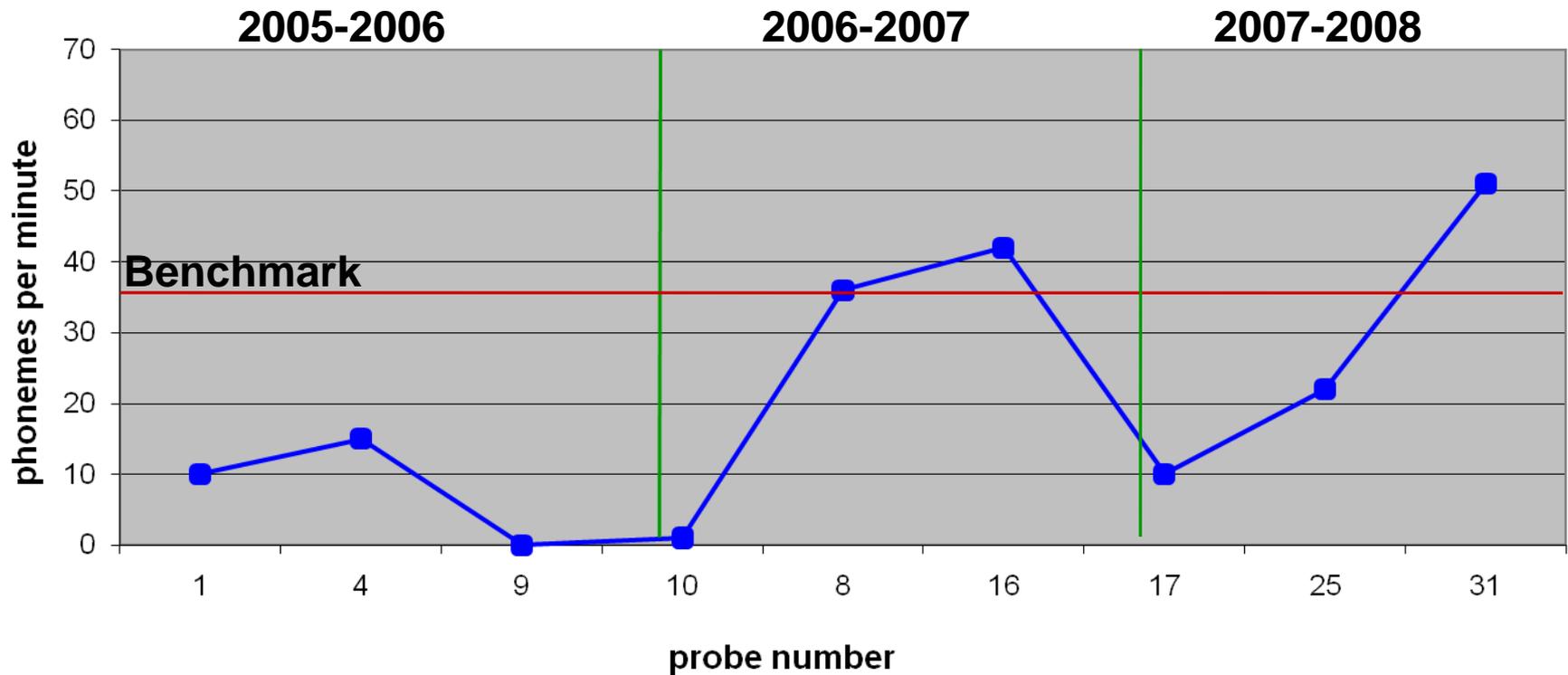
Growth in Nonsense Word Fluency for Bart
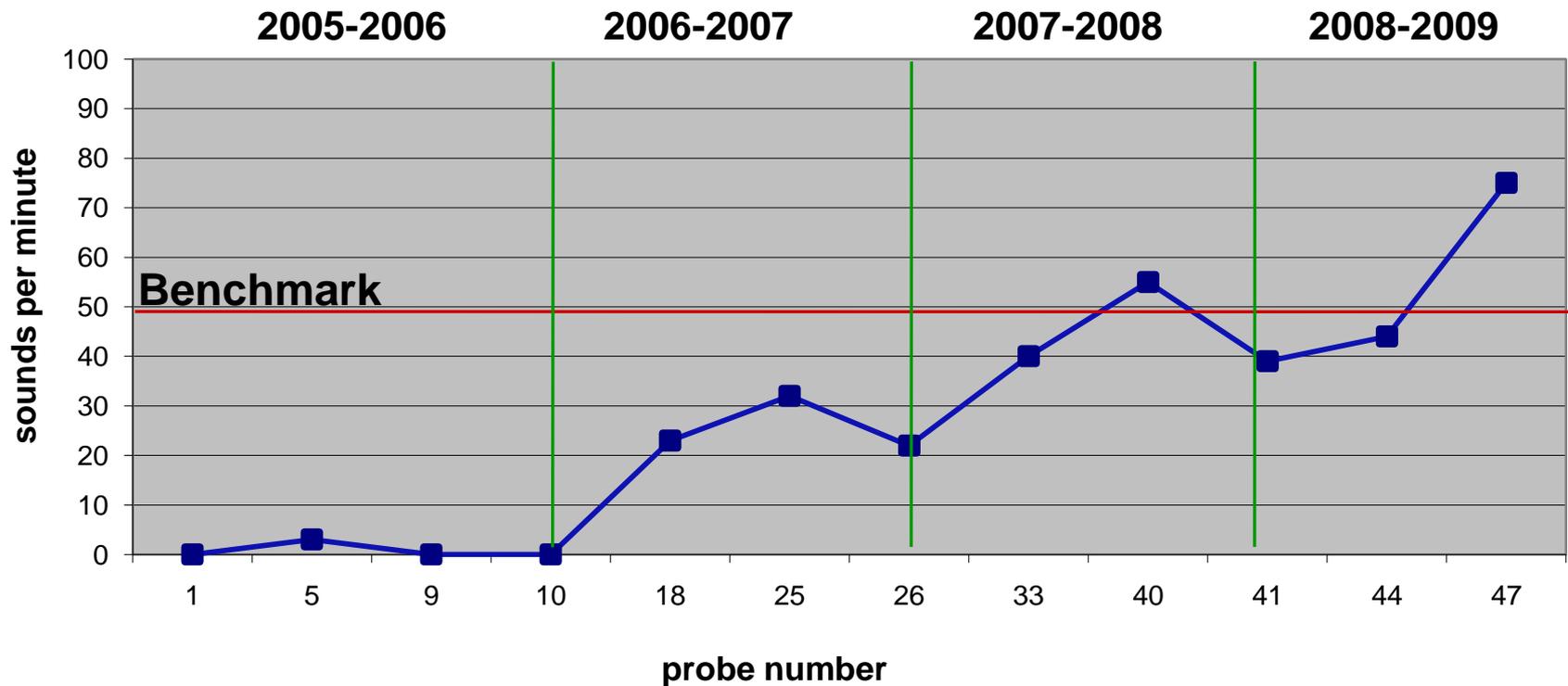
Growth in Oral Reading Fluency for Bart
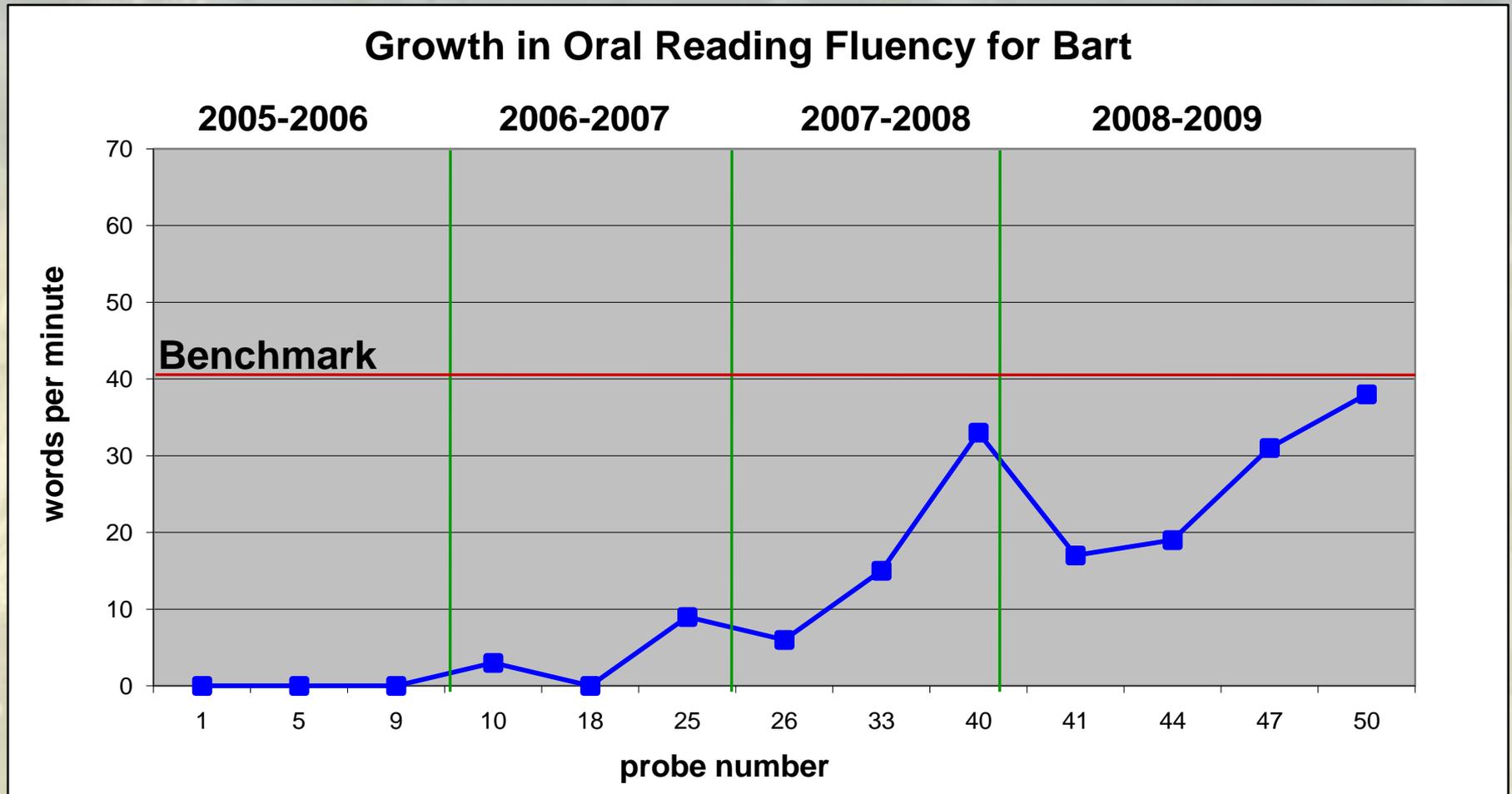
What Can Bart Read??
Sample Text

The squire told Lord Jay:
"Tell Queen Fay that
King Ray may sail a fancy kite
before dinner tonight."

6
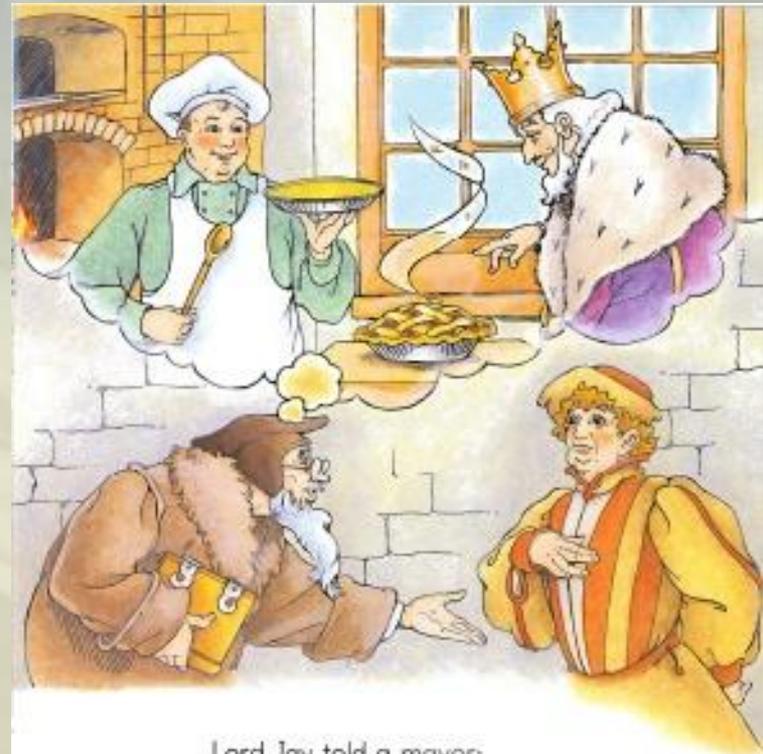
Lord Jay told a mayor:
"Tell Queen Fay that
King Ray may have berries on ice
for dinner tonight."

Techniques for Teaching Phonics/Word Recognition

- Reading Fast First
- Advanced letter-sound correspondence
- Feedback
  - I,We,You
  - (model, lead, test, review)

Picture of Bart's lesson

Lesson 96

Activity 3
Letter-Sound Introduction

(Hold up the **ol** letter-sound card. Point to ol, and say:) **When you see these two letters together, they say /o͞oolll/.**
What sound do these letters make? /o͞oolll/

ol

Individual Practice

(Give individual turns.)

Let's practice words that have *ol* in them. First sound out the underlined part. Then read the whole word.

(Touch under cold.) **Sound out the underlined part.** /o͞oolll/
Read the word. cold
Yes, *cold*. Next word.

> Repeat the process with the following words: **scold, mole, roll, mold, golden, troll, fold, old, unfold.**

Individual Practice

(Provide individual practice with 2–3 words per student.)

(Check off this activity on the Mastery Sheet, and continue with the next activity.)

102 Lesson 96

ol

cold   scold   mole

roll   mold   golden

troll   fold   old   unfold

Curriculum:
Immediate Feedback and Modeling

Model: "My turn" or "I"

Lead: "Our turn" or "We"

Test: "Your turn" or "You"

Retest: "Backing up"

Techniques for Teaching Fluency

- Decodable Texts
  - "Story-Time Readers"
- Unison Reading
- Fluency Goals
  - "Beat the Clock"
    - Individual
    - Partner

Example IEP Objectives

- Orally read an ending first grade level passage with appropriate prosody at least 40 words per minute

Linking Word Recognition and Meaning

- Sentence strip activity
- Sentence level comprehension
- Practice with word recognition

Reading Comprehension

- Wh Questions

- [DDD 2008 San Diego\clip 9 9 30 2008 comprehension Bart.mov](DDD 2008 San Diego\clip 9 9 30 2008 comprehension Bart.mov)

"Kenny"

- Grade: 4th grade (began study in 2nd grade)
- IQ: 68
- Diagnosis: MR
- Placement: General education classroom with inclusion support

Kenny's Story:

- Kenny is a very respectful student who wants to please; works hard
- Very little support at home
- Gets bogged down with vocabulary
- Struggles with comprehending long texts
- Kenny finished year 3 in the middle of Level 2

Modifications Used:

- Break down long texts into shorter, more manageable "chunks"
- Short, kid-friendly definitions for unknown vocabulary words; keeps a word journal
- Daily verbal and written communication with parents and classroom teacher

Growth in Phoneme Segmentation Fluency for Kenny

Growth in Nonsense Word Fluency for Kenny

Growth in Nonsense Word Fluency for Kenny
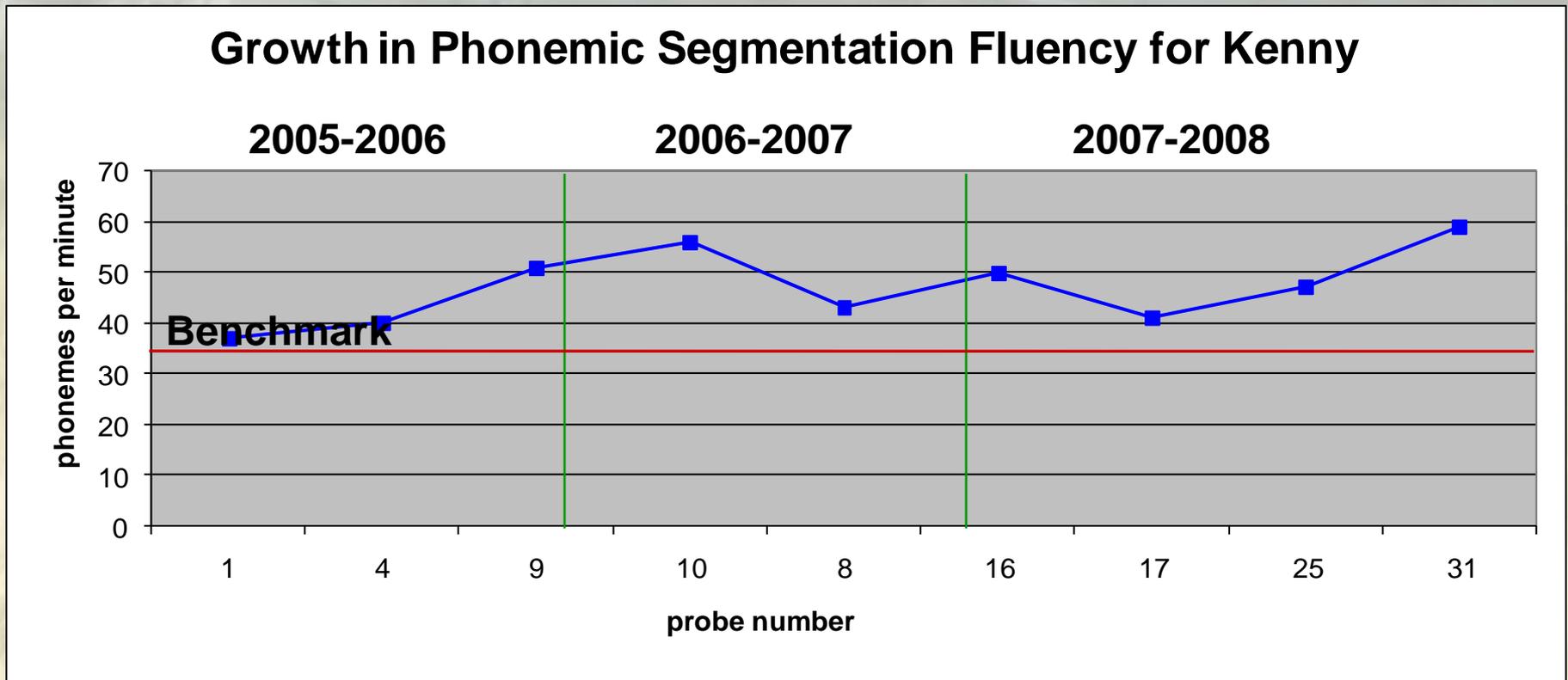
Growth in Oral Reading Fluency for Kenny
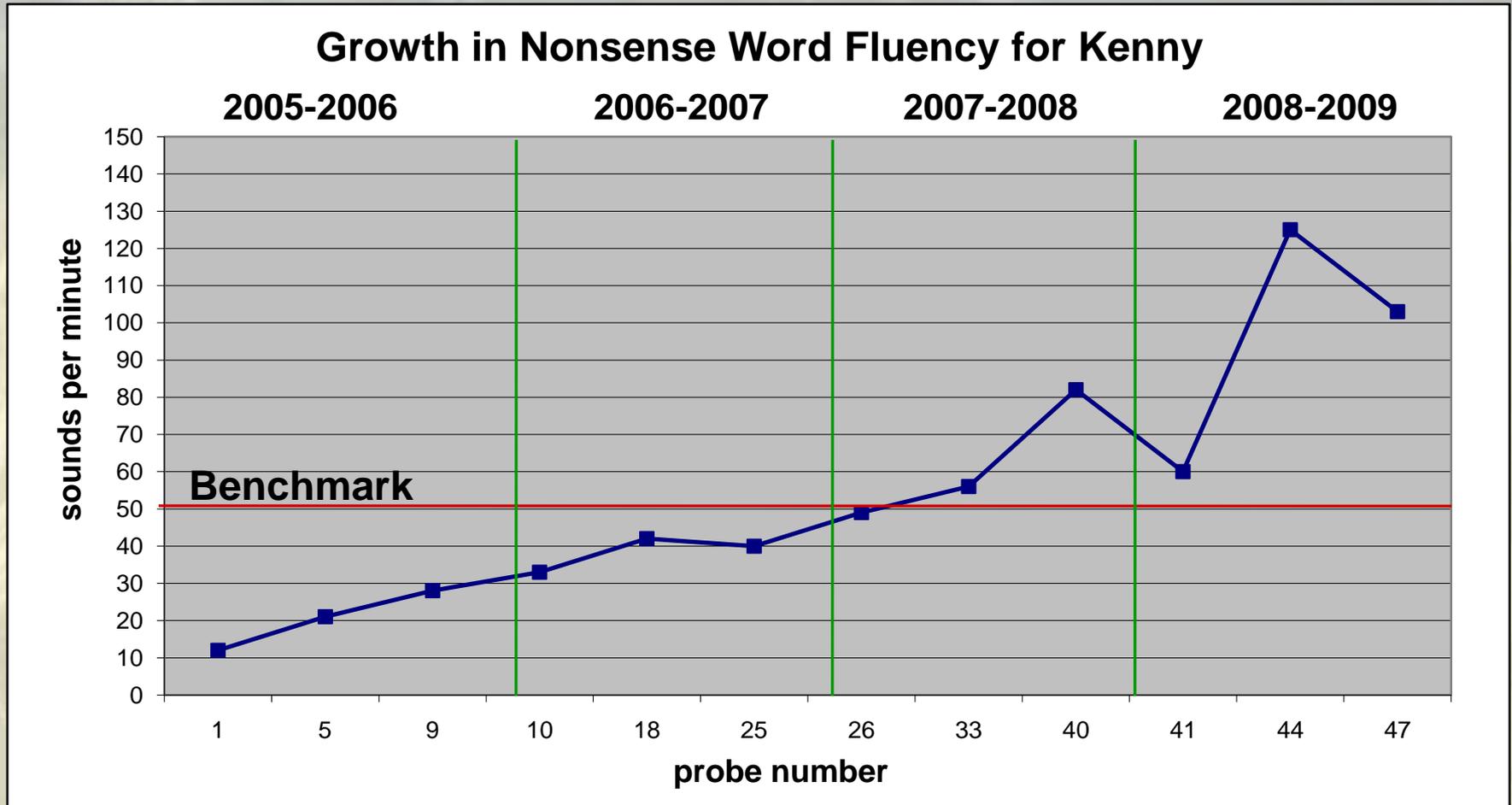
Growth in Oral Reading Fluency for Kenny
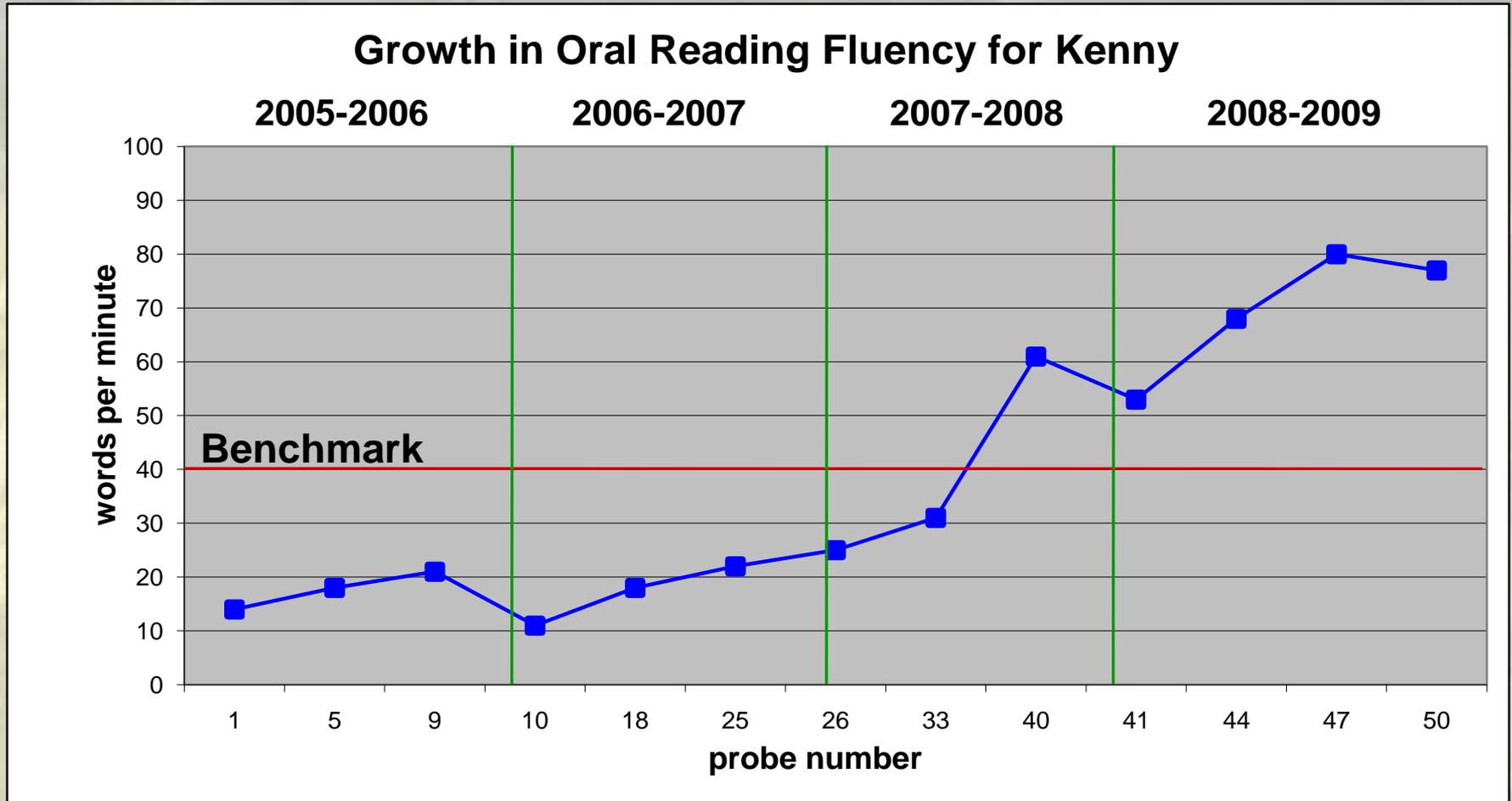
What Can Kenny Read??
Sample Text

Hurricanes

Hurricanes are very dangerous storms that form over oceans. The oceans are near land areas known as the tropics. The temperature is very high. The ocean water around the land is very warm. Hurricanes need hot land and very warm water to form.

90

Hurricanes form in five places. They form in the Atlantic Ocean, the Caribbean Sea, the Gulf of Mexico, the Indian Ocean, and the Pacific Ocean. If they move fast, they can travel far. Some hurricanes that hit the United States start near Africa!

91

Example IEP Objectives

- Pronounce multisyllabic words made up of the following patterns and syllable types: CVC-CVC (e.g. rabbit)
- Apply flexible strategy for determining the pronunciation of unknown multisyllabic words

Techniques for Teaching Comprehension

- "Context Clues"
  - Reading and writing connections
- "Story Grammar"
- "Sequencing"
- "Content Web"
- "Making Inferences"
- "What I Know" and "What I Learned" Charts

Example IEP Objectives

- Identify the main idea of a paragraph in 10 words or less

One more child… After 1 year, PSF

(benchmark =35)
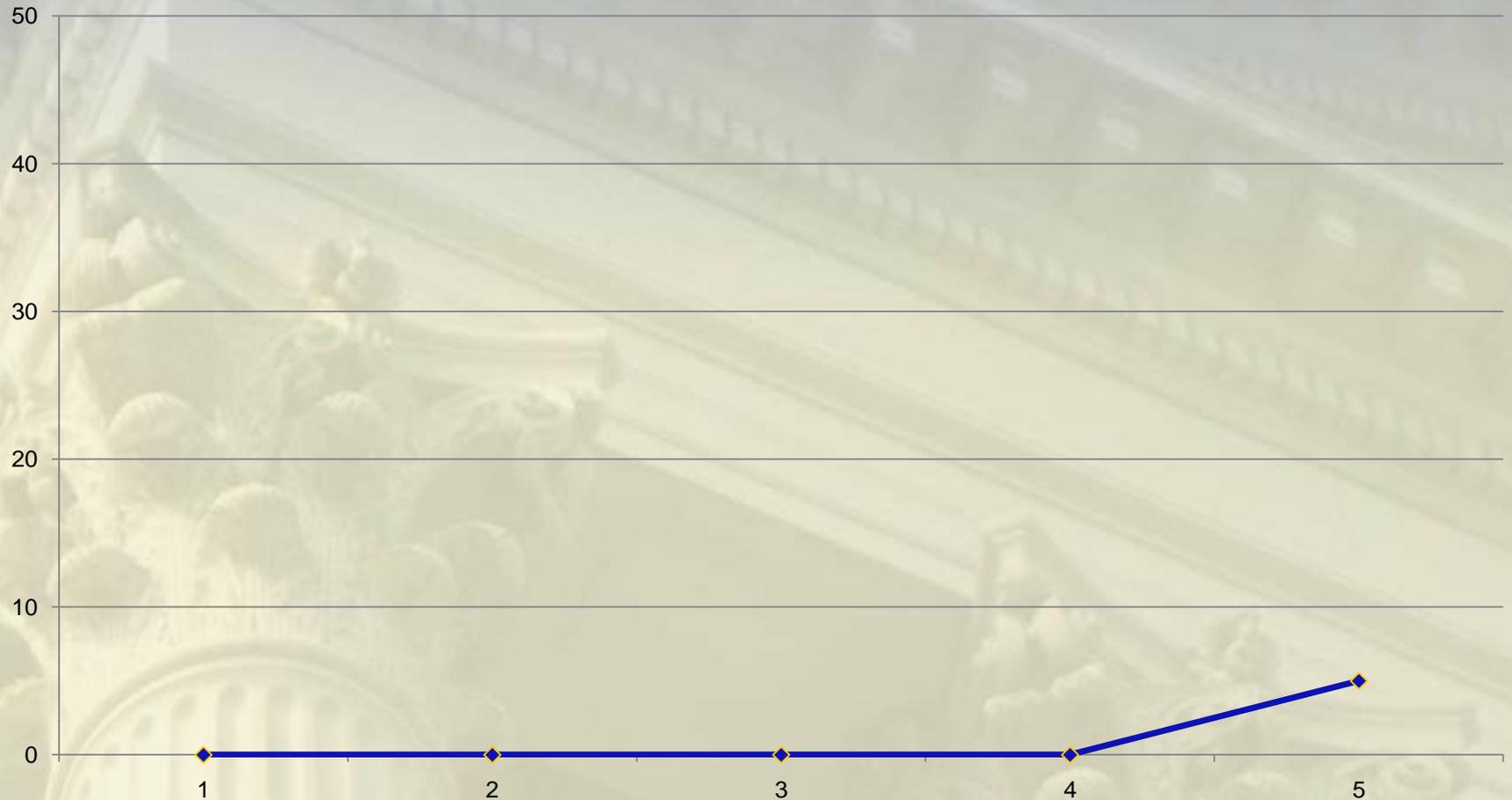
After 3 years… PSF (benchmark=35)
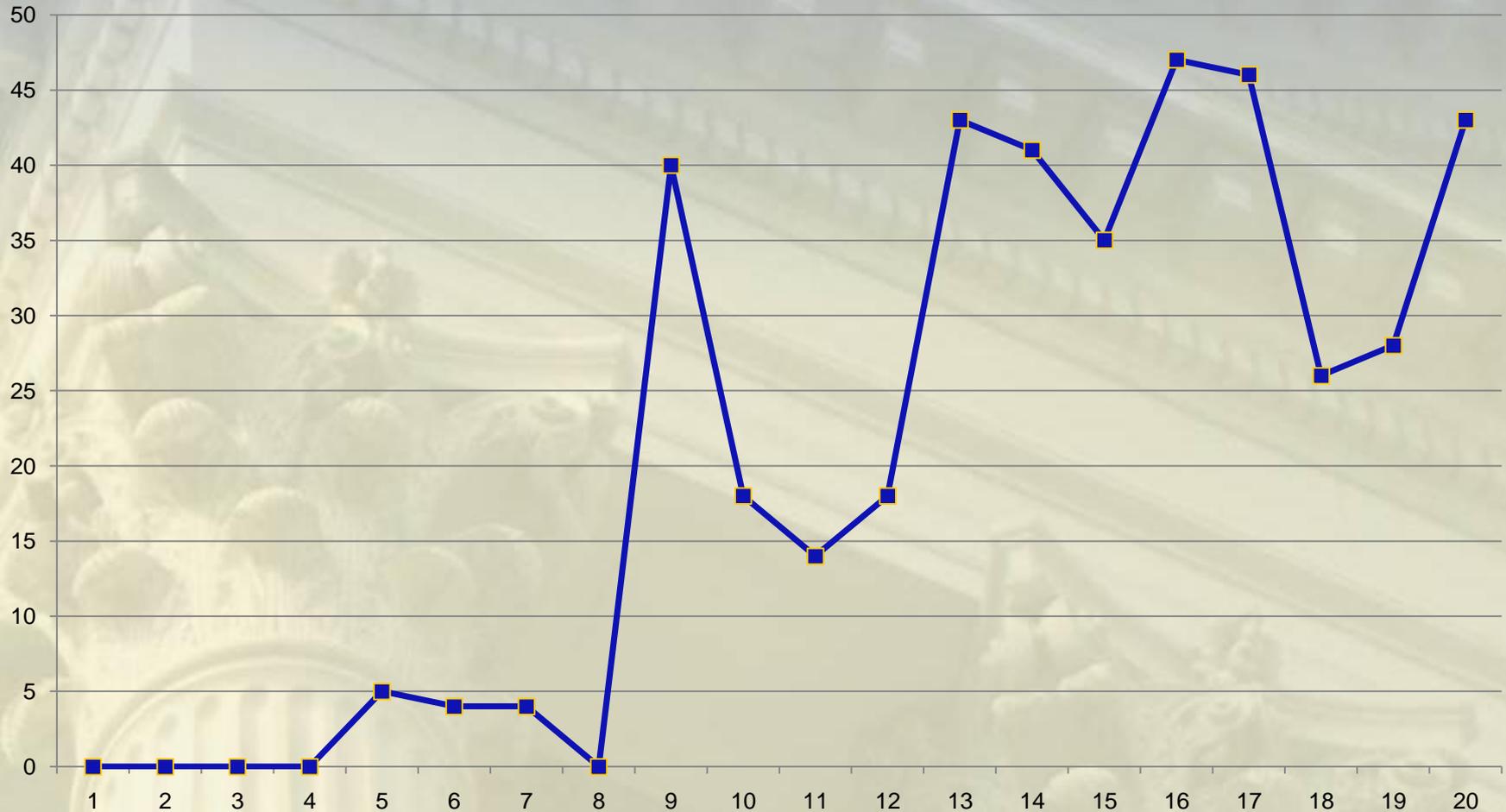
After 1 year… NWF
(benchmark = 50)
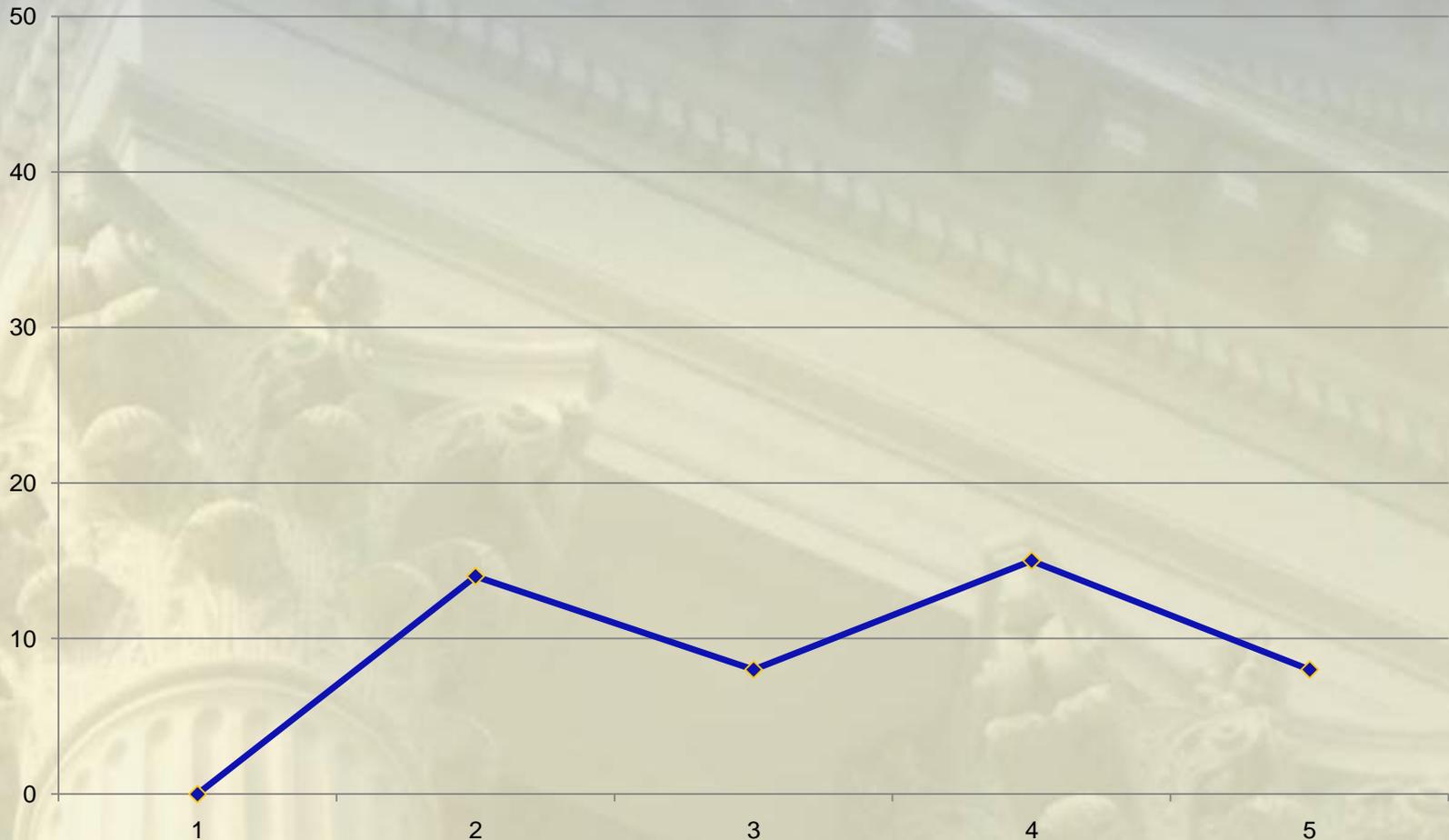
After 3 years, NWF
## (benchmark = 50)
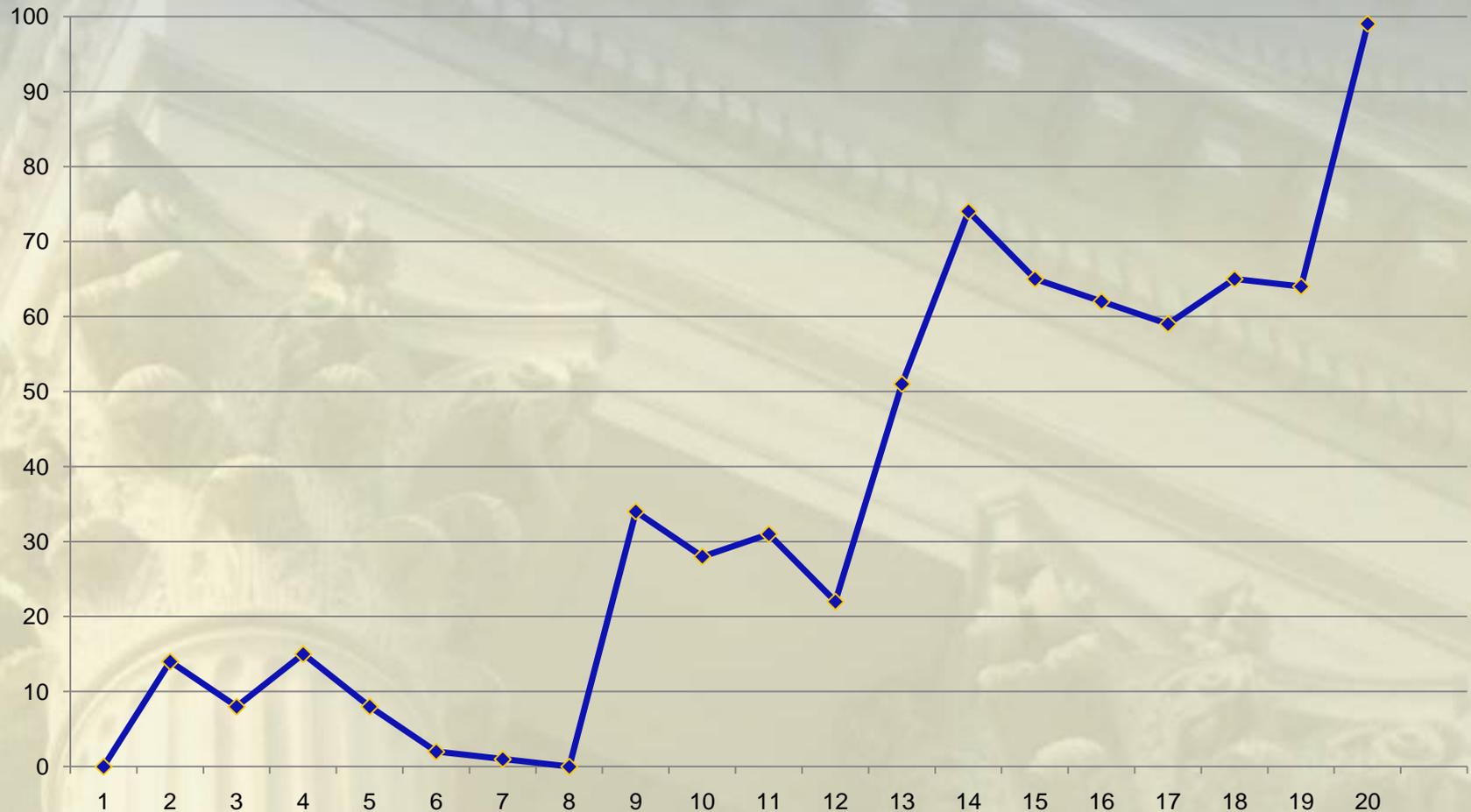
After 2 years, ORF
(first grade benchmark = 40)
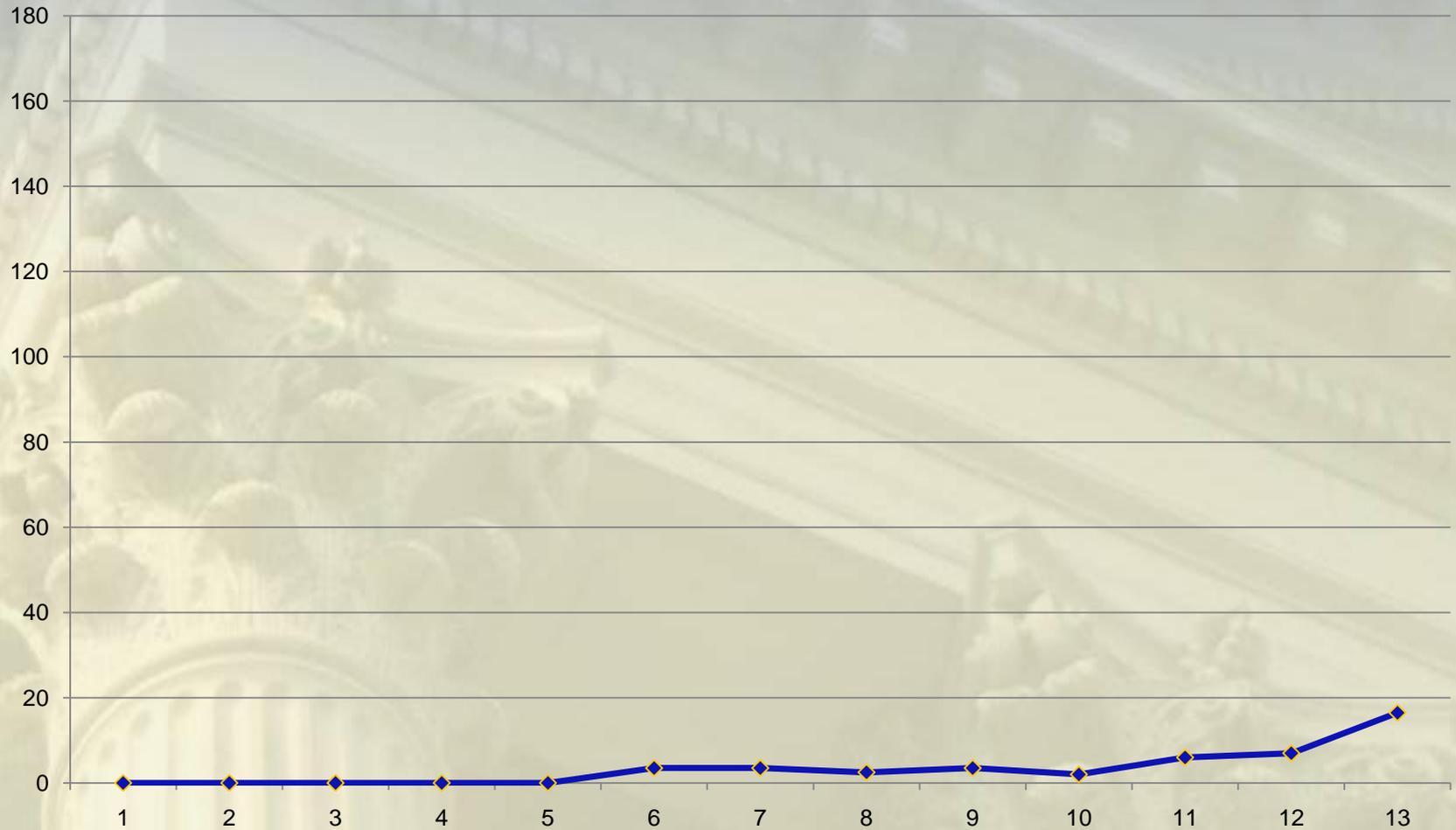
After 4 years, ORF
(first grade benchmark =40)
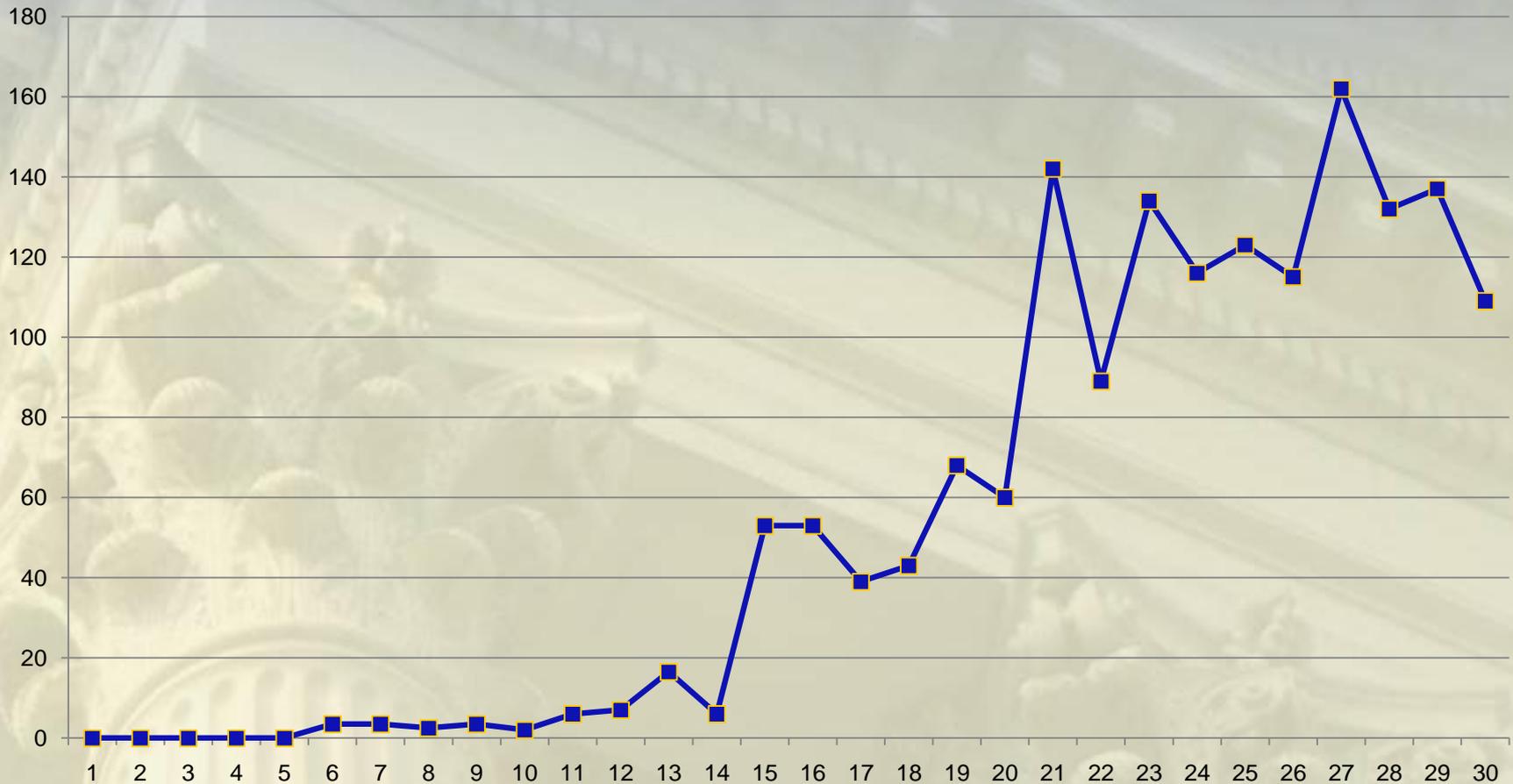
Conclusions

- On average, students with ID respond favorably to a comprehensive reading intervention consistent with current scientifically-based reading instruction

- An extensive amount of instructional time was required to achieve basic literacy skills

- On average, our students required approximately 3 years to reach minimum levels of ending first grade level

- Performance among our students was highly variable

Practical Applications

- Seek out reading interventions with proven effectiveness
- Implement with high degrees of fidelity over a long period of time
- Individualize instruction
- Seek out expertise of reading coaches, speech therapists, and behavior experts

Project Maximize

- Principal Investigators
Dr. Patricia Mathes
Dr. Jill Allor
- Project Coordinators
Dr. Francesca Jones
Tammi Champlin

- For further information:
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