

Technical Report # 40

**The Development of Word and Passage Reading Fluency Measures for
use in a Progress Monitoring Assessment System**

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Introduction

In this technical report, we describe the development alternate forms of Word and Passage Reading Fluency measures as part of a comprehensive progress monitoring literacy assessment system developed in 2006 for use with students in Kindergarten through fourth grade. We begin with a brief overview of the two conceptual frameworks underlying the assessment system: progress monitoring and developmental theories of reading. We then provide context for how the Word Reading measures fit into the full assessment system. Additional technical reports provide similar information about measures of Early Literacy such as Letter Names, Letter Sounds, and Phoneme Segmenting (Alonzo & Tindal, 2007) and Reading Comprehension (Alonzo, Liu, & Tindal, 2007).

Conceptual Framework: Progress Monitoring and Literacy Assessment

Early work related to curriculum-based measurement (CBM) led by Deno and Mirkin at the University of Minnesota (*c.f.a.*, Deno & Mirkin, 1977) was instrumental in promoting the use of short, easily-administered assessments to provide educators with information about student skill development useful for instructional planning. In the three decades since, such *progress monitoring probes* as they have come to be called have increased in popularity, and they are now a regular part of many schools' educational programs (Alonzo, Ketterlin-Geller, & Tindal, 2007). However, CBMs – even those widely used across the United States – often lack the psychometric properties expected of modern technically-adequate assessments. Although the precision of instrument development has advanced tremendously in the past 30 years with the advent of more sophisticated statistical techniques for analyzing tests on an item by item basis rather than relying exclusively on comparisons of means and standard deviations to evaluate comparability of alternate forms, the world of CBMs has not always kept pace with these statistical advances.

A key feature of assessments designed for progress monitoring is that alternate forms must be as equivalent as possible to allow meaningful interpretation of student performance data across time. Without such cross-form equivalence, changes in scores from one testing session to the next are difficult to attribute to changes in student skill or knowledge. Improvements in student scores may, in fact, be an artifact of the second form of the assessment being easier than the form that was administered first. The advent of more sophisticated data analysis techniques (such as the Rasch modeling used in this study) have made it possible to increase the precision with which we develop and evaluate the quality of assessment tools. In this technical report, we document the development of a progress monitoring assessment in reading, designed for use with students in Kindergarten through Grade 4. This assessment system was developed to be used by elementary school educators interested in monitoring the progress their students make in the area of early reading skill acquisition.

Reading is a somewhat fluid construct, shifting over time from a focus on discrete skills necessary for working with language in both written and spoken forms, to those more complex combinations of skills associated with decoding, and finally to comprehension—a construct in which all prior literacy skills are called upon in the act of reading. Reading assessment typically follows this general progression as well (Reading First, 2006). Assessments of emerging literacy skills evaluate student mastery of the alphabetic principal. These tests measure students' ability to correctly identify and/or produce letters and the sounds associated with them. They measure students' ability to manipulate individual phonemes (sound units) within words, when, for example, students are asked to blend a list of phonemes into a word, segment a word into its corresponding phonemes, or identify the sounds which begin or end a word (Ritchey & Speece, 2006). The relationships between these constructs in English are well-documented in the

research literature. In early readers, ability to identify letter names and the sounds that letters make predicts phonemic awareness. Phonemic awareness predicts fluency, and low fluency is a strong predictor of difficulties in reading (National Reading Panel, 2000).

As student reading skill progresses, it is necessary to use different reading measures to be able to continue to track the progress students are making as developing readers. Oral reading fluency, which measures a combination of students' sight vocabulary and their ability to decode novel words rapidly and accurately, is consistently identified in the literature as one of the best predictors of student reading comprehension in the early grades (Graves, Plasencia-Peinado, Deno, & Johnson, 2005; Hasbrouck & Tindal, 2005). Eventually, however, the information provided by measures of oral reading fluency is limited. Readers attain a fluency threshold that enables them to attend to comprehension rather than decoding (Ehri, 1991, 2005). Once this threshold has been reached, fluency is no longer sensitive to increases in reading comprehension. At this point, one must turn to measures designed to assess comprehension more directly. Although this technical report provides information specifically related to the Word and Passage Reading Fluency measures developed for use in our Progress Monitoring assessment system, it is important to provide an overview of the complete system so readers can understand how the fluency measures fit into the system as a whole.

The Measures that Comprise Our Complete Assessment System

Based on previous empirical studies of early literacy assessment (see, for example, the report from the National Reading Panel, 2000), we decided to develop two measures of alphabetic principle (Letter Names and Letter Sounds), one measure of Phonological Awareness (Phoneme Segmenting), two measures of fluency (Word Reading Fluency and Passage Reading Fluency), and one measure of comprehension (Multiple Choice Reading Comprehension). The

specific technical specifications for the Word and Passage Reading Fluency measure are described in the methods section of this technical report. First, we describe the specific requirements related to the intended use of the measures in our assessment system.

When one is interested in monitoring the progress students are making in attaining specific skills, it is important to have sufficient measures to sample student performance frequently. Thus, our goal was to create 20 alternate forms of each measure in our assessment system at each grade level where the measure was designed to be used (see Table 1). Because these alternate forms are designed to be used for progress monitoring, it is essential that all forms of a particular measure in a given grade level be both sensitive to showing growth in a discrete skill area over short periods of time (1-2 weeks of instruction) and comparable in difficulty. These two equally important needs informed all parts of our measurement development effort: the construction of the technical specifications for each of the measures, the design of the studies used to gather data on item and test functioning, the analytic approaches we used to interpret the results of the pilot studies, and subsequent revision of the measures. In all cases, we sought approaches that would provide us with enough information to evaluate the *sensitivity of the individual measures* to detect small differences in student performance and the *comparability of the different forms* of each measure to allow for meaningful interpretation of growth over time.

Table 1
Distribution of the Measures Across the Grades

Grade	Measure					
	Letter Names	Letter Sounds	Phoneme Segmenting	Word Reading Fluency	Passage Reading Fluency	MC Reading Comp
Kindergarten	X*	X	X	X		
Grade 1	X	X	X	X	X	
Grade 2			X	X	X	
Grade 3				X	X	X
Grade 4					X	X

*Note: Each “X” represents 20 alternate forms of the measure for that grade level.

In the section that follows, we describe the piloting methods used to gather information on the relative difficulty of different words, allowing us to create an item bank from which we could draw to construct 20 comparable alternate forms per grade level of a test of Word Reading Fluency for use in a progress monitoring assessment system. Because the Passage Reading Fluency measures could not be analyzed using the same IRT approach (each passage acts as a single ‘item’ and cannot, therefore, be divided into smaller pieces for use in an item bank), we also describe the alternate pilot design used for those measures.

The Word Reading Fluency Measure

The Word Reading Fluency measure tests students’ ability to read both sight-words and words following regular patterns of letter/sound correspondence in the English language, allowing them to be easily decodable. In this individually-administered measure, students are shown a series of words organized in a chart on one side of a single sheet of paper and given a set amount of time (ranging from 30 – 60 seconds on different versions of this measure) to read

as many of them as they can. A trained assessor follows along as the student reads the words, indicating on his/her own test protocol each word the student reads incorrectly and prompting the student to go on if he/she hesitates at a word for more than three seconds. Student self-corrections are counted as correct responses. At the end of the allotted time, the assessor marks the last word read and calculates the total number of words read correctly to arrive at the student's score, words read correctly in one minute (on tests administered for shorter times, it is common practice to use a multiplier to convert the raw score to a 'per minute' fluency-based score).

The Passage Reading Fluency Measure

The Passage Reading measure tests students' ability to read connected narrative text accurately. In this individually-administered measure, students are shown a short narrative passage (approximately 250 words) printed on one side of a single sheet of paper and given a set amount of time (ranging from 30 – 60 seconds on different versions of this measure) to read as much of the passage as they can. A trained assessor follows along as the student reads, indicating on his/her own test protocol each word the student reads incorrectly and prompting the student to go on if he/she hesitates for more than three seconds. Student self-corrections are counted as correct responses. At the end of the allotted time, the assessor marks the last word read and calculates the total number of words read correctly to arrive at the student's score, words read correctly in one minute (on tests administered for shorter times, it is common practice to use a multiplier to convert the raw score to a 'per minute' fluency-based score).

Methods

Our goal was to create 20 alternate forms of each measure at each grade level where the measure was designed to be used (see Table 1). Because these alternate forms will be used for

progress monitoring, it is essential that all forms of a particular measure in a given grade level be comparable in difficulty. The methods we used to create these comparable alternate forms are described in the following section.

Creating Alternate Forms of the Word Reading Fluency Measure

To design alternate forms of the Word Reading Fluency measure, we gathered information about the difficulty of specific words during a pilot testing session between May 15 and June 9, 2006 and created an item pool from which we could draw as we created the 20 alternate forms of the Word Reading Fluency measure at each of four grade levels, for a total of 80 different forms of this measure. The words we used during the pilot study came from a variety of sources: Dolch word lists, online grade-level word lists, and a list of ‘the first 1000 words’ found in XX’s (date) book of lists. They included words with both regular and irregular sound patterns and were a variety of lengths.

Following recommendations by Kolen and Brennan (1995), we used a common item nonequivalent groups design to pilot each word we were considering including in our item bank. We used information from this piloting to create a calibrated item pool, with all words placed on the same θ scale. In other words, although not every word was administered to every student in the pilot testing, there was enough overlap of items between the different forms of the measure used in piloting to allow us to analyze all the data simultaneously. The items shared across the different forms of the test (common items) allowed us to calibrate all items on the same metric, an essential pre-requisite for creating an item bank. To accomplish our ultimate goal of being able to create 20 comparable alternate forms of the Word Reading Fluency measure in Kindergarten through third grade, we gathered information about the difficulty of each word by administering a variety of Word Reading Fluency forms to a sample of students in Kindergarten

through third-grade in a large suburban school district in the Pacific Northwest. In all, between 144 and 2654 students provided pilot test data on each word, with the words used as anchor items accounting for the highest number of student interactions.

To reduce the likelihood that fatigue would influence student performance on the measure of word reading, we kept each of the pilot forms short (68 words in Kindergarten, 80 in grades 1-3) and administered only one form to each student. In addition, because our primary goal during the piloting was to gather information about the relative difficulty of each of the words, we extended the amount of time students had to complete the test to four minutes. This time extension during the piloting enabled all students to provide pilot test data relative to the difficulty of items, reducing the likelihood that students with lower estimated abilities would ‘time out’ before they were able to provide information about the difficulty of items near the end of the test form.

We administered 5 different forms of the Word Reading Fluency test to students in Kindergarten, 4 forms to students in first grade, and 3 forms to students in third and fourth grade each, for a total of 15 forms. Each form contained 5 words that served as anchor items, common across all 15 forms of the test. To allow for later equating and scaling across and between forms, the five anchor item words appeared consistently in the same locations on all forms of the Word Reading Fluency measure (see Figure 1).

Figure 1
Word Reading Fluency Template, Showing Locations of Five Items Common to All Forms

		will	
	about	remain	no
and			

These anchor items were used during analysis to allow concurrent estimation of item difficulty across all 15 forms of the test. In keeping with Kolen and Brennan's (1995) recommendations, the anchor items were located in the same position on each form of the test.

Creating Alternate Forms of the Passage Reading Fluency Measures

The passages used in the Passage Reading Fluency measures were all written specifically for use in this progress monitoring assessment system. All 80 passages were written by graduate students enrolled in College of Education courses in the winter of 2006. Passage writers followed written test specifications (see Appendix A). All passages underwent a four-stage review process. First, the lead author, who holds a Bachelor's of Arts degree in English and is a National Board for Professional Teaching Standards certified English teacher, reviewed each passage. She edited the passages for grammatical correctness and grade-level appropriateness. Then, two graduate students edited for formatting consistency. They divided each passage into three paragraphs of approximately even length and checked the readability of each paragraph using the Flesch-Kincaid readability index feature available on Microsoft Word. Each first-grade paragraph was adjusted as needed to create three paragraphs with a readability level between 1.4 and 1.6. Each second-grade paragraph was adjusted as needed to create three paragraphs with a readability level between 2.4 and 2.6. Each third-grade paragraph was adjusted as needed to create three paragraphs with a readability level between 3.4 and 3.6. Each fourth-grade paragraph was adjusted as needed to create three paragraphs with a readability level between 4.4 and 4.6.

Third, each passage was reviewed by a teacher with a minimum of three years' teaching experience at that particular grade level to ensure the topics, wording, and style were appropriate for the target grade levels. Finally, passages were sent back to the lead author for a final review

to ensure that they still met test specifications. Once the review process was complete, the passages were printed on 8 ½ by 11 inch paper for use during the pilot testing process.

Analysis of the Word Reading Fluency Measures

Item parameters were estimated using a one-parameter Rasch model analyzed with Winsteps3.61.1 analytic software (Linacre, 2006). Rasch analyses differ from approaches using classical statistics in that they consider patterns of responses across individuals, using this information to provide a level of specificity in results unattainable with approaches based on classical statistics used in the development of most CBMs. In a complex iterative process, a Rasch analysis concurrently estimates the difficulty of individual test items and the ability level of each individual test taker. The results one obtains from this analysis, relevant to our discussion here, include an estimation of the difficulty (referred to as the *measure* of each item), the *standard error of measure* associated with each item's estimated difficulty, and the degree to which each item 'fits' the measurement model (referred to as the *mean square outfit* of each item). All of this information must be considered when evaluating the technical adequacy of the measures, as described below.

Considering each item's estimated difficulty. Rasch analyses, which examine each item's reliability, provide a more precise treatment of reliability than classical statistics, which examine the issue only at a more global test level. The most reliable estimation of a test-taker's ability can be gained from tests comprised of items that represent the fullest range of difficulty possible for the population with which the test is intended to be used.

Thus, in creating our Word Reading Fluency measures, it is necessary for us to select items representing a range of difficulties. In Rasch analyses, this information is gleaned from examining each item's *measure*. Easy items will have measures represented with negative

numbers; difficult items will have measures represented with positive numbers. A measure of zero indicates an item that a person of average ability would be expected to have a 50% chance of getting correct. Thus, we sought a full range of measures on every Word Reading Fluency measure.

Examining the standard error of measure. Rasch analyses provide information about the standard error of measure associated with the estimation of each item's measure. In general, the smaller the standard error of measure, the more reliable the estimation. We sought small standard errors of measure on all items on our tests. Items where the standard error of measure is too great for reliable estimation are indicated on the output files with a notation that the computer program was unable to provide a reliable estimate of the item's difficulty.

Using the mean square outfit to evaluate goodness of fit. An additional piece of information used to evaluate technical adequacy in a Rasch model is the mean square outfit associated with each item. Values in the range of 0.50 to 1.50 are considered *acceptable fit*. Mean square outfits falling outside this acceptable range indicate the need for further evaluation of item functioning. Such further evaluation takes into consideration additional sources of information, such as the standard error associated with the item's estimation as well as the sample size used to generate the estimate of model fit. In general, items with a mean square outfit less than 0.50 are considered less worrisome than items with mean square outfits higher than 1.50. Our technical specifications called for the exclusion of any items with unacceptable mean square outfits from the item bank.

Analysis of the Passage Reading Fluency Measures

Unlike the other measures in the Progress Monitoring Assessment System, the Passage Reading measures are not appropriate for analysis using Item Response Theory, as each form of

the measure would be considered a single ‘item’ with a score ranging from 0 – 255. Thus, we analyzed the Passage Reading Fluency forms using classical statistics. More specifically, we analyzed both correlations and mean differences between the different forms of the measures using a repeated measures analysis. To increase the reliability of our score interpretations, we administered all 20 alternate forms of each grade level passage to the same group of students, over the course of one week (each student completed four Passage Reading Fluency forms per day). To further reduce variability caused by different testers, students were administered all 20 Passage Reading Fluency measures by the same tester.

Results

Both the Word Reading Fluency items and the Passage Reading Fluency measures were pilot tested in the spring of 2006. We present the results of this pilot testing, by type of measure, below.

Results of the Word Reading Fluency Pilot Testing

The Word Reading Fluency items were piloted using 5 common items across 15 separate forms of the measure to equate items across forms. Results of this piloting are presented in Table 2.

Table 2

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
the	1960	-6.21	1.10
or	1960	-2.81	2.72
will	2654	-3.78	0.85
number	2198	-1.55	0.66
of	1960	-2.93	9.90
about	2654	-1.54	0.58
remain	2654	2.13	3.14
no	2654	-3.71	4.43
and	2654	-5.20	1.15
little	1960	-3.03	4.45
much	1960	-1.80	1.69

well	1960	-2.18	5.01
change	195	1.32	0.06
between	195	0.13	0.75
along	195	-0.81	1.07

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
car	195	-3.46	0.94
watch	195	-0.33	0.69
question	195	-0.03	0.51
top	195	-5.37	0.93
fast	195	-4.00	0.95
in	353	-5.64	2.98
but	195	-3.56	1.08
my	195	-3.11	0.72
is	195	-6.31	1.29
his	195	-4.16	0.83
only	438	-1.52	0.17
through	230	1.34	1.06
another	195	0.32	0.58
again	195	-0.70	4.48
food	195	-2.60	1.09
while	440	1.14	1.50
feet	195	-3.07	0.89
face	195	0.32	0.13
sun	195	-4.84	0.71
become	195	-0.19	0.70
cover	195	-1.10	0.87
it	195	-6.01	1.21
were	438	2.51	9.90
been	195	-1.77	2.36
he	195	-4.22	0.91
an	195	-4.90	0.95
take	195	-1.27	0.42
help	195	-2.64	0.59
does	440	0.32	0.62
picture	195	-0.58	0.31
add	195	-3.11	3.76
few	195	0.13	0.92
side	195	-0.33	1.21
eat	195	-2.07	0.77
stand	195	-1.01	1.70
sure	403	1.19	0.67
space	195	0.75	0.07
down	195	-1.19	0.51
they	195	-0.46	0.57

sound	195	0.13	0.48
where	195	0.13	0.77
end	195	-2.07	0.84
hand	195	-1.57	0.59

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
near	195	-0.33	0.21
don't	195	-0.91	0.28
back	195	-1.64	0.51
any	195	-0.19	0.56
turn	195	-0.33	2.02
house	195	-0.70	0.56
father	440	0.38	0.65
open	641	-1.20	0.72
grow	884	-0.99	0.58
girl	678	-1.23	0.88
on	312	-3.59	2.63
can	312	-3.52	2.08
its	312	-3.96	1.54
are	456	-2.00	0.97
children	312	-0.05	1.33
enough	312	-0.79	0.89
color	312	-1.40	1.07
door	312	-1.60	0.64
rock	312	-3.32	0.99
enter	312	-1.44	0.70
stay	506	-1.82	0.98
wait	312	0.71	1.20
new	312	-0.89	0.62
great	312	-2.55	1.50
put	312	-1.04	0.79
kind	312	0.81	0.32
every	312	-0.44	0.62
left	312	-1.31	1.24
until	312	-0.56	0.91
idea	312	0.10	0.49
music	520	-0.42	1.29
read	456	-1.90	1.13
wind	968	1.22	6.52
be	1206	-0.40	7.16
do	312	-1.97	2.45
come	312	-3.52	0.72
this	312	-2.38	0.62
over	312	-2.41	2.05
say	312	-2.29	0.62

set	312	-3.50	1.05
try	312	-2.75	1.38
high	312	-1.68	1.85
saw	312	-2.20	1.82

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
important	312	-0.56	1.36
miss	312	-3.79	0.88
body	312	-3.50	1.00
order	312	-2.32	2.06
listen	312	0.43	2.22
had	312	-3.46	0.68
other	312	-1.83	1.30
way	312	-3.61	0.78
to	312	-2.95	1.59
work	312	-2.55	0.56
before	555	-2.11	0.50
large	312	-0.79	0.52
off	312	-3.48	1.14
own	312	-2.53	0.90
might	312	-0.99	0.74
mile	312	-1.75	2.34
far	312	-0.84	1.83
fish	312	-1.90	0.49
ship	312	-1.60	0.79
several	312	-1.75	3.25
one	312	-2.13	0.48
people	550	-1.24	0.61
problem	312	-1.04	0.74
best	312	-1.40	1.39
morning	312	-0.79	0.73
have	312	-2.16	0.59
their	550	-0.71	0.40
has	550	-2.10	0.97
may	550	-1.36	1.05
give	550	-1.34	0.37
a	158	-1.88	0.44
by	158	-1.32	0.35
know	158	-1.81	0.36
line	158	-0.71	0.32
must	158	-0.59	0.35
play	158	-0.94	0.32
below	403	-0.62	1.45
close	158	-0.33	2.47
night	403	-0.53	0.28

area	158	-1.04	0.63
across	158	-1.41	0.83
hold	158	-1.41	0.95
word	158	-0.71	1.12

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
out	158	-0.19	1.78
could	158	-0.94	1.03
not	158	-0.19	0.14
place	158	0.48	0.24
right	158	0.48	0.22
big	158	-0.94	0.87
spell	158	0.48	0.12
country	158	0.48	0.11
something	158	-0.71	0.46
walk	158	0.12	0.11
mark	158	-1.04	1.03
today	158	0.12	0.22
himself	158	-1.23	1.00
notice	158	-0.19	0.39
many	158	-0.04	0.31
than	158	-0.83	0.60
that	158	-1.50	0.63
year	158	-0.33	0.37
too	158	-3.41	1.23
even	158	1.38	1.36
air	158	-0.59	1.52
plant	158	-0.19	0.89
seem	158	-1.14	2.32
white	158	1.13	0.08
almost	158	-0.04	0.49
dog	158	-3.85	1.53
during	158	1.13	0.42
toward	158	1.95	3.04
all	158	-1.95	0.50
them	158	-1.23	1.02
water	158	-0.04	0.12
you	158	-3.22	1.08
school	158	-1.14	0.35
old	158	-1.14	0.62
because	158	1.38	0.06
animal	158	-0.04	0.12
me	403	-2.75	1.85
hard	158	-0.04	0.25
began	158	0.89	0.21

above	403	0.99	0.29
horse	158	-0.04	0.14
short	158	0.48	0.20
five	158	-0.83	0.42

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
what	158	-0.59	2.17
then	158	-0.59	0.33
first	158	-0.59	3.36
same	144	-0.68	0.80
here	144	-1.57	0.57
point	144	0.74	0.89
keep	144	-2.05	0.87
example	144	0.90	3.64
took	144	-1.27	0.67
sometimes	144	0.18	5.08
complete	144	0.74	0.96
however	144	0.44	1.19
passed	144	0.31	0.82
from	144	-2.65	1.48
if	1253	-4.13	9.90
look	144	-2.42	0.91
part	144	-0.59	0.70
most	144	-0.06	0.47
tell	144	-2.54	1.27
why	144	-0.59	1.67
page	144	1.28	0.90
tree	144	-1.85	0.88
begin	389	0.44	0.77
river	144	-0.28	0.72
mountain	144	0.74	2.09
room	144	-2.05	0.82
low	144	-0.77	0.85
vowel	144	1.08	0.58
how	144	-1.20	0.98
time	144	-1.12	0.40
made	144	0.18	0.33
as	144	-3.29	1.95
very	144	-0.77	0.42
boy	144	-1.50	0.74
ask	144	-2.76	1.24
letter	144	0.18	0.84
never	144	-0.77	0.32
life	144	-0.06	0.54
four	144	-1.12	0.41

cut	144	-2.42	1.31
knew	144	0.05	0.41
hours	144	1.08	1.13
true	144	0.31	0.31

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
there	144	-0.06	0.59
would	367	0.04	1.08
find	144	-0.28	0.56
with	144	-1.03	0.49
thing	144	-0.77	0.41
came	144	-0.39	0.40
men	144	-2.05	1.14
answer	144	0.59	9.90
city	387	-0.70	0.43
state	144	0.74	0.41
those	144	-0.18	0.65
talk	144	1.08	0.46
since	144	2.01	1.64
black	144	-0.68	0.54
hundred	144	1.73	0.28
use	144	0.59	0.33
make	144	-0.77	0.46
long	144	-0.86	0.64
said	144	-0.39	1.82
our	144	-0.06	2.69
want	382	-0.07	1.78
found	627	0.22	0.83
soon	238	-1.42	0.88
both	238	0.73	0.96
earth	238	0.23	3.18
once	238	0.47	1.18
piece	238	0.59	1.97
happen	238	-0.67	0.66
pattern	238	0.47	1.94
her	238	-0.95	1.83
now	238	-2.07	0.62
I	238	-7.33	1.36
which	238	-0.60	0.49
just	238	-2.03	0.78
show	481	-1.23	0.60
need	238	-2.19	0.85
study	238	0.47	0.96
eye	238	-0.52	7.32
paper	483	0.77	1.84

book	238	-2.82	0.76
list	238	-2.41	1.03
told	238	-1.08	0.90
whole	238	0.73	2.42

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
at	238	-5.78	2.89
herself	238	0.35	0.53
him	238	-3.65	1.31
did	238	-3.76	1.32
name	238	-1.72	0.66
also	238	0.12	0.31
land	238	-1.81	0.81
still	238	-1.72	0.62
light	238	-0.08	0.19
together	238	0.12	0.64
hear	238	-0.74	1.91
song	238	-1.62	0.67
usually	483	2.84	8.92
measure	483	2.94	6.65
table	238	-0.27	0.40
she	1347	-3.41	0.77
into	483	-2.68	0.59
get	483	-3.44	1.31
each	483	-0.39	0.27
good	483	-1.79	0.50
around	483	0.15	0.33
different	483	-0.08	0.43
learn	238	0.23	0.95
thought	238	1.18	0.56
stop	238	-2.52	0.69
got	483	-2.23	9.90
friends	483	-0.94	0.45
early	483	0.87	0.77
money	238	-0.17	0.76
mercy	238	1.97	0.26
think	1109	-2.21	1.20
small	1109	-1.93	0.76
move	245	-0.62	1.11
man	245	-4.32	1.37
three	245	-2.27	4.98
us	245	-3.37	9.90
world	245	-0.52	1.40
story	245	-1.47	0.48
run	245	-4.19	9.78

later	245	1.45	2.34
it's	245	-3.08	3.52
heard	245	1.61	2.86
reached	245	1.56	1.05

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
map	245	-3.28	3.04
upon	245	-0.11	2.59
street	245	-1.14	0.74
stood	245	0.78	1.93
America	245	-0.04	1.28
under	245	-1.94	0.62
often	245	-0.23	1.79
second	245	1.06	1.37
family	245	-2.00	0.51
easy	245	0.32	0.51
waves	245	0.65	1.41
sentence	245	1.45	2.35
form	245	1.45	7.92
home	245	-2.41	1.93
should	245	-1.14	1.54
head	245	0.61	1.65
group	245	1.25	1.54
without	245	0.28	0.64
leave	245	0.04	0.78
slowly	245	0.24	0.84
wood	245	-1.37	0.71
fact	245	-1.04	1.98
base	245	1.25	1.17
mother	245	-1.21	0.44
north	245	-0.04	0.59
travel	245	0.40	0.58
feel	245	-0.80	0.70
machine	245	3.86	9.90
like	245	-1.04	0.53
follow	245	0.40	0.51
sea	245	-0.83	0.61
day	208	-3.03	0.67
live	208	-2.56	9.90
young	208	0.28	1.34
halt	0	0.00	1.00
surface	194	3.06	0.44
ran	254	-1.15	2.19
was	208	1.74	2.48
step	208	-0.36	1.06

English	208	1.37	1.05
contain	402	4.06	9.73
when	208	-1.71	0.89
gave	208	-1.01	9.90

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
figure	208	2.58	1.75
road	208	0.23	1.29
course	402	2.34	1.00
so	208	-1.83	0.84
mulch	210	2.89	1.50
always	451	-0.48	0.59
ground	208	0.36	0.52
ten	451	-1.36	0.38
produce	208	4.09	1.11
who	451	-0.48	0.78
followed	208	1.32	0.78
landed	208	1.37	0.62
answered	208	1.53	0.41
unit	254	3.72	5.05
fly	254	-2.20	0.58
building	254	2.36	1.58
boat	254	-0.22	0.70
can't	254	-2.89	0.69
matter	254	0.61	0.90
square	254	0.98	0.74
syllables	254	4.87	3.11
perhaps	254	2.76	2.35
bill	254	-2.25	0.52
felt	254	-0.61	1.18
suddenly	254	1.31	0.99
test	254	-0.80	0.96
direction	254	3.31	0.56
center	254	2.27	8.11
farmers	254	1.36	2.90
ready	254	0.65	1.28
anything	254	0.13	1.12
divided	254	4.65	0.66
general	230	2.02	0.56
energy	254	4.00	3.08
subject	254	1.14	0.73
Europe	254	4.05	0.41
moon	254	-1.93	0.76
region	254	6.26	9.90
return	254	1.66	0.62

believe	254	1.40	0.61
dance	254	1.14	0.37
members	254	1.36	0.86
plane	254	1.57	2.37

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
system	254	3.12	1.19
behind	254	1.96	0.38
round	254	1.27	0.44
force	254	1.79	1.06
game	254	-0.72	0.60
brought	254	2.45	0.84
understand	254	2.27	0.50
warm	254	0.73	1.03
common	254	3.35	2.66
bring	254	0.45	0.71
explain	254	1.44	0.38
dry	254	0.01	0.33
though	254	5.33	1.37
language	254	4.98	6.09
shape	254	0.77	0.55
deep	254	-0.41	0.56
thousands	254	4.76	0.76
yes	254	-1.64	4.18
clear	254	0.98	0.58
yet	254	-0.68	1.08
government	254	3.49	0.45
ago	254	1.27	0.69
less	254	0.25	0.67
week	254	-0.38	0.53
island	254	2.45	1.04
decided	194	3.73	0.45
class	194	-2.25	0.92
note	194	-0.01	1.95
nothing	194	-0.68	1.21
rest	194	-2.74	0.73
carefully	194	1.61	2.48
inside	194	-0.50	0.58
wheels	194	-0.45	1.15
scientists	194	4.72	9.13
green	194	-3.66	0.36
picked	194	-0.32	0.60
simple	194	0.89	1.76
cells	194	3.95	0.36
paint	194	0.74	1.35

mind	194	1.88	0.77
love	194	-2.97	0.72
case	194	0.27	1.10
rain	194	-0.94	0.92

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
exercise	194	3.59	2.99
eggs	194	-3.16	9.51
train	194	-0.94	0.78
blue	194	-2.97	0.43
wish	194	-2.15	1.21
dropped	194	-2.05	0.62
developed	194	3.45	1.61
window	194	-0.19	0.47
difference	194	1.34	1.25
heart	194	0.55	1.79
sit	194	-3.36	6.11
distance	194	3.45	2.25
sum	194	-2.68	1.40
summer	194	-1.48	0.61
wall	194	-0.41	0.87
forest	194	-0.36	0.84
probably	194	1.45	0.88
filled	194	0.09	3.31
heat	194	1.14	1.69
full	194	-0.23	0.62
hot	194	-2.30	2.69
check	194	0.09	1.34
object	194	0.94	0.84
am	194	-1.81	8.19
rule	194	0.94	0.77
among	194	2.87	0.95
noun	194	4.03	9.90
power	194	0.50	0.58
cannot	194	0.79	0.79
able	194	1.77	0.46
six	437	-1.78	0.66
size	194	0.79	0.59
dark	194	0.04	1.14
ball	194	-0.90	0.79
material	194	6.08	9.90
special	194	2.05	0.59
heavy	194	1.55	0.61
fine	194	-0.01	0.42
pair	194	1.34	0.57

circle	194	1.29	0.36
hair	864	-0.24	1.05
age	864	0.45	0.76
amount	864	0.39	0.66

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
scale	864	1.03	0.99
doctor	205	-0.86	0.38
sand	205	-1.22	3.43
hit	205	-2.76	0.56
tone	205	0.88	3.42
crops	205	0.23	1.38
insects	205	0.42	1.01
electric	205	2.24	0.59
corner	205	-0.24	0.58
supply	205	3.87	1.28
president	205	1.61	0.96
brown	205	-2.42	9.90
trouble	205	0.17	1.07
cool	205	-2.42	4.68
cloud	448	0.85	1.05
lost	205	-1.87	4.79
send	398	-0.51	2.88
symbols	205	2.62	1.52
wear	205	-0.62	3.72
bad	205	-1.13	1.18
save	205	-2.00	1.94
experiment	205	2.37	1.07
engine	205	3.50	1.73
alone	205	0.72	4.00
drawing	205	0.23	1.22
east	205	-0.46	1.43
pay	205	-0.95	2.74
single	205	1.31	0.80
touch	205	-0.39	1.67
information	205	0.48	1.00
express	205	0.04	0.81
mouth	205	-0.03	1.33
yard	205	-1.64	0.77
equal	205	1.75	0.91
decimal	205	5.10	2.99
guess	205	0.88	1.02
silent	205	2.28	0.68
trade	448	0.50	0.61
rather	205	0.66	0.61

compare	205	1.21	0.75
crowd	205	0.99	0.72
poem	205	1.75	0.95
enjoy	205	-0.31	0.30

Table 2 (Continued)

Results of IRT Analysis of Word Reading Fluency, Spring Pilot, 2006, Grades K-3

Word	Count	Measure	Mean Square Outfit
elements	205	1.75	1.94
indicate	205	3.76	1.25
except	205	3.20	2.14
flat	205	0.23	0.88
seven	205	-0.03	0.92
interesting	205	2.24	0.94
sense	205	1.10	0.67
string	205	0.83	1.35
blow	205	0.04	1.28
famous	205	2.37	0.50
value	205	2.33	0.95
wings	205	-0.03	0.46
movement	205	1.75	1.22
pole	205	0.66	0.86
exciting	448	1.85	0.97
cents	205	1.26	0.37

Initial analyses revealed 283 items outside the acceptable Mean Square Outfit range of 0.50 – 1.50. These items were dropped from the item bank, resulting in 465 remaining words. Table 3 gives a list of the words remaining, organized by Measure. The easiest words appear first in the list, with subsequent words increasing in difficulty.

Table 3

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
I	238	-7.33	1.36
is	195	-6.31	1.29
the	1960	-6.21	1.10
it	195	-6.01	1.21
ten	243	-5.65	1.00
top	195	-5.37	0.93
and	2654	-5.20	1.15
an	195	-4.90	0.95
sun	195	-4.84	0.71
man	245	-4.32	1.37
he	195	-4.22	0.91

his	195	-4.16	0.83
fast	195	-4.00	0.95
miss	312	-3.79	0.88
will	2654	-3.78	0.85

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
did	238	-3.76	1.32
him	238	-3.65	1.31
way	312	-3.61	0.78
but	195	-3.56	1.08
come	312	-3.52	0.72
body	312	-3.50	1.00
set	312	-3.50	1.05
off	312	-3.48	1.14
car	195	-3.46	0.94
had	312	-3.46	0.68
get	483	-3.44	1.31
she	1347	-3.41	0.77
too	158	-3.41	1.23
rock	312	-3.32	0.99
you	158	-3.22	1.08
my	195	-3.11	0.72
feet	195	-3.07	0.89
day	208	-3.03	0.67
love	194	-2.97	0.72
can't	254	-2.89	0.69
book	238	-2.82	0.76
ask	144	-2.76	1.24
hit	205	-2.76	0.56
try	312	-2.75	1.38
rest	194	-2.74	0.73
into	483	-2.68	0.59
sum	194	-2.68	1.40
from	144	-2.65	1.48
help	195	-2.64	0.59
food	195	-2.60	1.09
great	312	-2.55	1.50
work	312	-2.55	0.56
tell	144	-2.54	1.27
own	312	-2.53	0.90
stop	238	-2.52	0.69
trouble	230	-2.46	1.24
cut	144	-2.42	1.31
look	144	-2.42	0.91
list	238	-2.41	1.03

this	312	-2.38	0.62
say	312	-2.29	0.62
don't	230	-2.92	1.43
bill	254	-2.25	0.52

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
class	194	-2.25	0.92
think	1109	-2.21	1.20
fly	254	-2.20	0.58
need	238	-2.19	0.85
fall	210	-2.18	0.50
have	312	-2.16	0.59
wish	194	-2.15	1.21
before	555	-2.11	0.50
has	550	-2.10	0.97
eat	195	-2.07	0.77
end	195	-2.07	0.84
now	238	-2.07	0.62
dropped	194	-2.05	0.62
keep	144	-2.05	0.87
men	144	-2.05	1.14
room	144	-2.05	0.82
just	238	-2.03	0.78
are	456	-2.00	0.97
family	245	-2.00	0.51
all	158	-1.95	0.50
under	245	-1.94	0.62
moon	254	-1.93	0.76
fall	440	-1.93	1.00
small	1109	-1.93	0.76
read	456	-1.90	1.13
tree	144	-1.85	0.88
other	312	-1.83	1.30
so	208	-1.83	0.84
stay	506	-1.82	0.98
land	238	-1.81	0.81
good	483	-1.79	0.50
six	437	-1.78	0.66
I'm	230	-1.74	0.97
name	238	-1.72	0.66
still	238	-1.72	0.62
when	208	-1.71	0.89
back	195	-1.64	0.51
yard	205	-1.64	0.77
song	238	-1.62	0.67

door	312	-1.60	0.64
ship	312	-1.60	0.79
hand	195	-1.57	0.59
here	144	-1.57	0.57

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
number	2198	-1.55	0.66
about	2654	-1.54	0.58
boy	144	-1.50	0.74
that	158	-1.50	0.63
summer	194	-1.48	0.61
enter	312	-1.44	0.70
soon	238	-1.42	0.88
across	158	-1.41	0.83
hold	158	-1.41	0.95
best	312	-1.40	1.39
color	312	-1.40	1.07
wood	245	-1.37	0.71
may	550	-1.36	1.05
well	683	-1.34	0.85
left	312	-1.31	1.24
took	144	-1.27	0.67
people	550	-1.24	0.61
girl	678	-1.23	0.88
himself	158	-1.23	1.00
show	481	-1.23	0.60
them	158	-1.23	1.02
how	144	-1.20	0.98
myself	440	-1.20	0.76
open	641	-1.20	0.72
down	195	-1.19	0.51
old	158	-1.14	0.62
street	245	-1.14	0.74
woman	193	-1.14	0.76
bad	205	-1.13	1.18
cover	195	-1.10	0.87
told	238	-1.08	0.90
area	158	-1.04	0.63
clean	193	-1.04	0.75
like	245	-1.04	0.53
mark	158	-1.04	1.03
problem	312	-1.04	0.74
put	312	-1.04	0.79
park	416	-1.02	0.76
grow	884	-0.99	0.58

might	312	-0.99	0.74
zone	243	-0.99	1.32
are	210	-0.97	1.36
big	158	-0.94	0.87

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
could	158	-0.94	1.03
rain	194	-0.94	0.92
seeds	193	-0.94	0.80
train	194	-0.94	0.78
ball	194	-0.90	0.79
new	312	-0.89	0.62
long	144	-0.86	0.64
stick	193	-0.84	1.08
yellow	223	-0.84	0.88
sea	245	-0.83	0.61
than	158	-0.83	0.60
along	195	-0.81	1.07
feel	245	-0.80	0.70
test	254	-0.80	0.96
enough	312	-0.79	0.89
large	312	-0.79	0.52
morning	312	-0.79	0.73
low	144	-0.77	0.85
better	210	-0.77	0.58
game	254	-0.72	0.60
word	158	-0.71	1.12
house	195	-0.70	0.56
black	144	-0.68	0.54
nothing	194	-0.68	1.21
same	144	-0.68	0.80
yet	254	-0.68	1.08
happen	238	-0.67	0.66
team	223	-0.67	1.48
please	193	-0.66	1.42
below	403	-0.62	1.45
move	245	-0.62	1.11
pick	243	-0.62	1.50
felt	254	-0.61	1.18
feeling	223	-0.59	1.01
maybe	223	-0.59	0.67
part	144	-0.59	0.70
important	312	-0.56	1.36
until	312	-0.56	0.91
world	245	-0.52	1.40

inside	194	-0.50	0.58
always	451	-0.48	0.59
who	451	-0.48	0.78
boom	243	-0.46	1.07

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
east	205	-0.46	1.43
they	195	-0.46	0.57
wheels	194	-0.45	1.15
every	312	-0.44	0.62
music	520	-0.42	1.29
anyone	210	-0.42	0.91
farming	243	-0.42	1.48
deep	254	-0.41	0.56
wall	194	-0.41	0.87
week	254	-0.38	0.53
forest	194	-0.36	0.84
step	208	-0.36	1.06
side	195	-0.33	1.21
watch	195	-0.33	0.69
picked	194	-0.32	0.60
find	144	-0.28	0.56
river	144	-0.28	0.72
getting	230	-0.25	0.95
really	230	-0.25	1.09
corner	205	-0.24	0.58
hair	864	-0.24	1.05
full	194	-0.23	0.62
boat	254	-0.22	0.70
mass	243	-0.20	0.63
income	243	-0.20	0.63
any	195	-0.19	0.56
become	195	-0.19	0.70
plant	158	-0.19	0.89
those	144	-0.18	0.65
money	238	-0.17	0.76
fell	223	-0.16	0.67
mass	243	-0.16	0.62
dollars	193	-0.09	0.69
rich	193	-0.09	1.28
visit	193	-0.09	0.91
life	144	-0.06	0.54
there	144	-0.06	0.59
branch	243	-0.06	0.59
children	312	-0.05	1.33

America	245	-0.04	1.28
north	245	-0.04	0.59
branch	243	-0.03	0.60
mouth	205	-0.03	1.33

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
question	195	-0.03	0.51
seven	205	-0.03	0.92
halt	310	0.00	1.00
blow	205	0.04	1.28
dark	194	0.04	1.14
dusty	243	0.04	0.65
express	205	0.04	0.81
leave	245	0.04	0.78
spend	243	0.04	1.09
would	367	0.04	1.08
lie	193	0.05	1.14
sharp	193	0.05	0.65
check	194	0.09	1.34
together	238	0.12	0.64
didn't	210	0.12	1.30
anything	254	0.13	1.12
between	195	0.13	0.75
few	195	0.13	0.92
where	195	0.13	0.77
timeline	243	0.16	1.05
trouble	205	0.17	1.07
letter	144	0.18	0.84
loud	193	0.19	1.13
found	627	0.22	0.83
crops	205	0.23	1.38
drawing	205	0.23	1.22
flat	205	0.23	0.88
learn	238	0.23	0.95
road	208	0.23	1.29
slowly	245	0.24	0.84
less	254	0.25	0.67
wife	193	0.25	0.54
case	194	0.27	1.10
knew	230	0.28	0.74
marsh	243	0.28	0.79
without	245	0.28	0.64
young	208	0.28	1.34
passed	144	0.31	0.82
another	195	0.32	0.58

does	440	0.32	0.62
easy	245	0.32	0.51
hunting	223	0.34	1.44
herself	238	0.35	0.53

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
ground	208	0.36	0.52
father	440	0.38	0.65
amount	864	0.39	0.66
follow	245	0.40	0.51
grain	243	0.40	1.15
travel	245	0.40	0.58
insects	205	0.42	1.01
trails	243	0.42	0.85
begin	389	0.44	0.77
however	144	0.44	1.19
age	864	0.45	0.76
bring	254	0.45	0.71
garden	193	0.45	0.54
report	193	0.45	0.83
history	223	0.46	0.58
trails	243	0.46	0.86
once	238	0.47	1.18
study	238	0.47	0.96
information	205	0.48	1.00
power	194	0.50	0.58
trade	448	0.50	0.61
students	223	0.52	1.05
truck	223	0.52	0.65
isn't	223	0.57	0.74
matter	254	0.61	0.90
eight	193	0.63	0.71
stream	193	0.63	0.79
ready	254	0.65	1.28
waves	245	0.65	1.41
pole	205	0.66	0.86
rather	205	0.66	0.61
born	223	0.68	0.81
journal	230	0.70	0.48
wait	312	0.71	1.20
both	238	0.73	0.96
warm	254	0.73	1.03
complete	144	0.74	0.96
paint	194	0.74	1.35
point	144	0.74	0.89

shape	254	0.77	0.55
cannot	194	0.79	0.79
size	194	0.79	0.59
string	205	0.83	1.35

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
child	223	0.84	0.68
cloud	448	0.85	1.05
early	483	0.87	0.77
taxes	243	0.87	1.01
guess	205	0.88	1.02
inflate	243	0.92	0.82
object	194	0.94	0.84
rule	194	0.94	0.77
clear	254	0.98	0.58
square	254	0.98	0.74
crowd	205	0.99	0.72
degree	243	1.01	0.68
scale	864	1.03	0.99
second	245	1.06	1.37
hours	144	1.08	1.13
vowel	144	1.08	0.58
sense	205	1.10	0.67
lovable	230	1.13	0.65
subject	254	1.14	0.73
while	440	1.14	1.50
radio	223	1.18	0.54
thought	238	1.18	0.56
hurricane	243	1.19	0.64
sure	403	1.19	0.67
terror	243	1.19	0.73
compare	205	1.21	0.75
base	245	1.25	1.17
ago	254	1.27	0.69
weight	223	1.27	1.04
page	144	1.28	0.90
single	205	1.31	0.80
suddenly	254	1.31	0.99
followed	208	1.32	0.78
through	230	1.34	1.06
difference	194	1.34	1.25
pair	194	1.34	0.57
ahead	223	1.36	0.65
members	254	1.36	0.86
English	208	1.37	1.05

landed	208	1.37	0.62
even	158	1.38	1.36
cattle	193	1.39	0.80
believe	254	1.40	0.61

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
probably	194	1.45	0.88
serve	223	1.45	1.30
fossil	210	1.49	0.64
caught	223	1.54	0.58
heavy	194	1.55	0.61
reached	245	1.56	1.05
control	193	1.58	0.64
president	205	1.61	0.96
sight	193	1.62	1.49
strange	193	1.62	1.15
return	254	1.66	0.62
realize	230	1.66	0.57
practice	193	1.67	0.73
invade	243	1.70	0.78
branches	205	1.75	0.81
equal	205	1.75	0.91
movement	205	1.75	1.22
poem	205	1.75	0.95
printed	223	1.75	0.80
rise	193	1.76	0.94
protest	243	1.76	1.16
unhappiness	230	1.77	0.77
action	223	1.79	0.74
force	254	1.79	1.06
uncle	223	1.79	1.41
protest	243	1.81	1.23
terms	223	1.83	1.15
exciting	448	1.85	0.97
mind	194	1.88	0.77
suppose	193	1.94	0.64
thick	193	1.94	0.80
captain	223	1.95	1.18
shoulder	416	1.95	0.99
chance	223	1.99	0.84
human	223	1.99	1.01
community	210	2.00	0.51
general	230	2.02	0.56
blood	193	2.03	0.63
coast	193	2.03	1.49

special	194	2.05	0.59
business	223	2.07	0.71
fair	223	2.07	1.28
lifted	223	2.07	1.31

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
capital	223	2.11	1.05
governor	230	2.21	0.83
settled	223	2.22	1.29
electric	205	2.24	0.59
interesting	205	2.24	0.94
canyon	243	2.25	1.34
understand	254	2.27	0.50
silent	205	2.28	0.68
tube	223	2.33	1.18
value	205	2.33	0.95
course	402	2.34	1.00
entered	193	2.36	1.42
spread	193	2.36	0.69
territory	230	2.37	0.71
experiment	205	2.37	1.07
famous	205	2.37	0.50
independent	230	2.41	0.61
brought	254	2.45	0.84
island	254	2.45	1.04
statement	193	2.48	0.74
federal	243	2.50	0.86
resources	243	2.58	0.75
current	223	2.59	1.07
straight	193	2.60	0.62
factories	223	2.62	1.22
company	223	2.66	1.02
increase	223	2.69	0.92
century	243	2.70	0.96
astronaut	210	2.70	0.69
military	210	2.70	0.84
duty	243	2.76	1.11
science	193	2.76	1.09
wire	193	2.76	0.98
among	194	2.87	0.95
mulch	210	2.89	1.50
predict	243	2.93	1.01
property	223	2.93	1.36
Japanese	193	2.95	1.10

legal	243	3.01	1.11
observe	223	3.03	1.43
system	254	3.12	1.19
direct	223	3.20	1.21

Table 3 (Continued)

Words Retained for Word Reading Fluency Item Bank, Organized by Measure

Word	Count	Measure	Mean Square Outfit
senior	243	3.20	0.80
urban	243	3.20	1.09
confusion	210	3.27	0.77
direction	254	3.31	0.56
adapt	243	3.44	1.24
opinion	210	3.56	0.73
received	193	3.61	0.72
rhythm	193	3.68	0.89
indicate	205	3.76	1.25
planets	193	3.83	0.95
supply	205	3.87	1.28
crisis	243	3.96	1.20
produce	208	4.09	1.11
cultivate	243	4.11	1.30
period	193	4.24	0.69
irrigate	243	4.41	1.00
divided	254	4.65	0.66
deception	210	4.70	1.14
thousands	254	4.76	0.76
commercial	243	4.78	1.31
though	254	5.33	1.37
compromise	210	5.36	1.19

Results of the Passage Reading Fluency Pilot Testing

Descriptive statistics from the first grade Passage Reading Fluency pilot study are presented in Table 4. Table 5 shows the correlations between the first grade Passage Reading Fluency measures. Table 6 presents descriptive statistics from the second grade Passage Reading Fluency pilot, while Table 7 shows the correlations between the second grade Passage Reading Fluency measures. Table 8 presents descriptive statistics from the third grade Passage Reading Fluency; Table 9 shows the correlations between those measures. Table 10 presents descriptive

statistics from the fourth grade Passage Reading Fluency pilot; Table 11 shows the correlations between those measures.

Table 4
Descriptive Statistics for Grade 1 Passage Reading Measures

Passage	Title	<i>n</i>	<i>M</i>	<i>SD</i>
Gr1PR_1_C	The New Puppy	60.94	40.00	207
Gr1PR_2_C	Ice Cream Treat	62.98	37.31	205
Gr1PR_3_C	Patty the Pig	55.79	34.76	204
Gr1PR_4_C	The Dog Show	62.20	37.65	205
Gr1PR_5_C	Trains	57.73	36.96	206
Gr1PR_6_C	The Best Story Ever	63.44	42.30	206
Gr1PR_7_C	Making a Pizza	71.17	38.99	206
Gr1PR_8_C	Ocean Fish	59.60	35.70	206
Gr1PR_9_C	The Puppy	58.99	36.23	201
Gr1PR_10_C	The Airplane Ride	64.14	39.44	201
Gr1PR_11_C	The Story for Mom	60.97	40.87	201
Gr1PR_12_C	Loose Tooth	56.11	38.61	200
Gr1PR_13_C	A Prized Garden	62.40	35.52	203
Gr1PR_14_C	The Lake	55.44	36.52	204
Gr1PR_15_C	The Swing	67.68	40.42	204
Gr1PR_16_C	Play Ball	60.18	37.93	202
Gr1PR_17_C	Sick Day	61.14	39.07	195
Gr1PR_18_C	Hannah the Hamster	63.73	40.13	195
Gr1PR_19_C	Playful Sam	60.70	38.99	195
Gr1PR_20_C	The Fair	64.23	41.37	195

<i>Results of Repeated Measures Analysis Across All 20 Passages</i>			
Grand Mean	Standard Error	95% Confidence Interval	
		Lower Bound	Upper Bound
63.43	2.89	57.73	69.12

Table 5
Grade 1 Passage Reading Correlations between Passages ** $p < .001$

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
1	1																				
2	.95** 205	1																			
3	.95** 204	.95** 204	1																		
4	.96** 205	.96** 204	.96** 204	1																	
5	.96** 203	.95** 202	.95** 201	.96** 202	1																
6	.93** 203	.93** 202	.92** 201	.94** 202	.94** 206	1															
7	.93** 203	.92** 202	.91** 201	.93** 202	.94** 206	.91** 206	1														
8	.95** 203	.95** 202	.95** 201	.96** 202	.96** 206	.93** 206	.94** 206	1													
9	.92** 197	.92** 202	.92** 195	.93** 196	.93** 199	.91** 199	.91** 199	.93** 199	1												
10	.93** 197	.93** 196	.93** 195	.94** 196	.93** 199	.91** 199	.91** 199	.94** 199	.92** 200	1											
11	.93** 197	.93** 196	.93** 195	.93** 196	.93** 199	.92** 199	.90** 199	.93** 199	.91** 200	.96** 201	1										
12	.93** 196	.94** 195	.92** 194	.93** 195	.92** 198	.92** 198	.89** 198	.93** 198	.92** 199	.97** 200	.96** 200	1									
13	.92** 199	.92** 198	.92** 197	.92** 198	.92** 201	.91** 201	.91** 201	.92** 201	.91** 198	.95** 198	.95** 198	.96** 197	1								
14	.91** 200	.91** 199	.91** 198	.92** 199	.91** 202	.91** 202	.88** 202	.91** 202	.90** 199	.95** 199	.94** 199	.96** 198	.94** 203	1							
15	.92** 200	.93** 199	.92** 198	.94** 199	.93** 202	.92** 202	.91** 202	.93** 202	.91** 199	.96** 199	.95** 199	.97** 198	.96** 203	.96** 204	1						
16	.94** 198	.94** 197	.93** 196	.94** 197	.93** 200	.92** 200	.91** 200	.94** 200	.92** 197	.96** 197	.96** 197	.96** 196	.95** 201	.96** 202	.97** 202	1					
17	.91** 190	.92** 189	.93** 188	.93** 189	.92** 192	.89** 192	.90** 192	.93** 192	.91** 188	.93** 188	.94** 188	.95** 187	.96** 191	.95** 192	.95** 192	.95** 192	.95** 190	1			
18	.91** 190	.90** 189	.91** 188	.90** 189	.91** 192	.89** 192	.89** 192	.91** 192	.88** 188	.93** 188	.93** 188	.93** 187	.94** 191	.93** 192	.94** 192	.94** 190	.94** 195	.92** 195	1		
19	.95** 190	.94** 189	.94** 189	.94** 189	.94** 192	.92** 192	.92** 192	.94** 192	.92** 188	.96** 188	.96** 188	.96** 187	.95** 191	.96** 192	.97** 192	.97** 190	.95** 195	.94** 195	.94** 195	1	
20	.94** 190	.94** 189	.94** 189	.94** 189	.94** 192	.93** 192	.92** 192	.94** 192	.92** 188	.96** 188	.96** 188	.96** 187	.96** 191	.95** 192	.96** 192	.96** 190	.94** 195	.94** 195	.94** 195	.97** 195	1

Table 6
Descriptive Statistics for Grade 2 Passage Reading Measures

Passage	Title	<i>n</i>	<i>M</i>	<i>SD</i>
Gr2PR_1_C	Ebony	183	90.97	41.93
Gr2PR_2_C	Jessie's Adventure	184	101.23	44.08
Gr2PR_3_C	Emily's Day at Home	184	109.99	43.35
Gr2PR_4_C	Jake's New Bike	184	93.61	42.90
Gr2PR_5_C	Moving to a New House	184	102.98	46.82
Gr2PR_6_C	The Magic Show	184	103.67	44.10
Gr2PR_7_C	Music	184	86.89	39.87
Gr2PR_8_C	The Fastest Bird	184	106.27	47.75
Gr2PR_9_C	Baking Cookies	181	111.30	42.77
Gr2PR_10_C	No More School	180	87.85	37.52
Gr2PR_11_C	Summer Cash	180	97.37	41.64
Gr2PR_12_C	The Contest	178	88.70	41.97
Gr2PR_13_C	Salty Breakfast	177	91.56	38.44
Gr2PR_14_C	The Winter Play	177	100.34	43.23
Gr2PR_15_C	Time for Bed	177	100.69	43.44
Gr2PR_16_C	Emily's New Bike	177	105.95	44.59
Gr2PR_17_C	Soccer Ball	171	109.25	46.84
Gr2PR_18_C	The Spelling Bee	171	81.08	34.70
Gr2PR_19_C	Tom's Team	172	102.53	39.26
Gr2PR_20_C	Brian's Dream	173	87.26	44.07

Results of Repeated Measures Analysis Across All 20 Passages

Grand Mean	Standard Error	95% Confidence Interval	
		Lower Bound	Upper Bound
98.73	3.2	92.41	105.05

Table 7
Grade 2 Passage Reading Correlations between Passages ** $p < .001$

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1																			
2	.92** 183	1																		
3	.93** 183	.94** 184	1																	
4	.93** 183	.94** 184	.94** 184	1																
5	.91** 182	.93** 183	.93** 183	.94** 183	1															
6	.92** 182	.94** 183	.95** 183	.95** 183	.94** 184	1														
7	.93** 182	.92** 183	.93** 183	.95** 183	.92** 184	.95** 184	1													
8	.93** 182	.93** 183	.94** 183	.96** 183	.93** 184	.96** 184	.95** 184	1												
9	.92** 180	.93** 181	.94** 181	.95** 181	.93** 180	.95** 180	.94** 180	.94** 180	1											
10	.92** 179	.92** 180	.93** 180	.94** 180	.92** 179	.94** 179	.94** 179	.94** 179	.95** 180	1										
11	.91** 179	.91** 180	.92** 180	.94** 180	.92** 179	.94** 179	.94** 179	.94** 179	.94** 180	.95** 180	1									
12	.92** 177	.92** 178	.93** 178	.95** 178	.92** 177	.94** 177	.94** 177	.95** 177	.94** 178	.96** 178	.95** 178	1								
13	.90** 176	.90** 177	.91** 177	.91** 177	.90** 176	.92** 176	.91** 176	.92** 176	.91** 177	.91** 177	.91** 177	.91** 175	1							
14	.91** 176	.93** 177	.94** 177	.94** 177	.91** 176	.94** 176	.93** 176	.94** 176	.94** 177	.94** 177	.93** 177	.93** 175	.93** 176	1						
15	.93** 176	.93** 177	.95** 177	.95** 177	.92** 176	.94** 176	.94** 176	.95** 176	.95** 177	.94** 177	.94** 177	.95** 175	.93** 176	.96** 177	1					
16	.91** 176	.92** 177	.94** 177	.94** 177	.92** 176	.94** 176	.93** 176	.94** 176	.93** 177	.92** 177	.93** 177	.93** 175	.92** 176	.95** 177	.95** 177	1				
17	.90** 170	.91** 171	.92** 171	.93** 171	.91** 171	.94** 171	.93** 171	.95** 171	.92** 170	.94** 170	.94** 170	.95** 169	.91** 169	.93** 169	.94** 169	.93** 169	1			
18	.91** 170	.91** 171	.91** 171	.93** 171	.89** 171	.93** 171	.92** 171	.93** 171	.91** 170	.92** 170	.92** 170	.93** 169	.89** 169	.91** 169	.93** 169	.91** 169	.94** 170	1		
19	.92** 171	.93** 172	.93** 172	.93** 172	.92** 172	.94** 172	.93** 172	.94** 172	.93** 171	.94** 171	.93** 171	.93** 169	.91** 169	.94** 169	.94** 169	.92** 169	.94** 170	.93** 170	1	
20	.93** 172	.92** 173	.92** 173	.94** 173	.92** 173	.95** 173	.96** 173	.95** 173	.94** 172	.94** 172	.95** 172	.95** 171	.92** 170	.93** 170	.95** 170	.93** 170	.95** 171	.94** 171	.94** 172	1

Table 8
Descriptive Statistics for Grade 3 Passage Reading Measures

Passage	Title	<i>n</i>	<i>M</i>	<i>SD</i>
Gr3PR_1_C	Susan's New School	239	128.79	39.00
Gr3PR_2_C	Sara's Fun Visit	240	131.38	44.29
Gr3PR_3_C	Horses at the Fair	241	125.15	39.18
Gr3PR_4_C	Ben's Truck	240	127.55	43.61
Gr3PR_5_C	Surprise Sandwiches	242	128.55	36.85
Gr3PR_6_C	Swimming	243	131.77	40.99
Gr3PR_7_C	Boring Weekends	243	121.67	43.07
Gr3PR_8_C	Birthday Wishes	243	124.92	40.79
Gr3PR_9_C	A Special Bike	239	126.45	39.93
Gr3PR_10_C	The New Puppy	240	118.22	38.49
Gr3PR_11_C	Childhood Dreams	239	103.28	41.57
Gr3PR_12_C	The Perfect Instrument	240	121.64	40.47
Gr3PR_13_C	The Breaking Story	237	118.58	39.99
Gr3PR_14_C	The Dream House	237	124.06	41.83
Gr3PR_15_C	American Sports	237	110.19	37.67
Gr3PR_16_C	The Backpacking Trip	236	119.29	40.80
Gr3PR_17_C	The Garden	231	116.26	37.23
Gr3PR_18_C	Abby's Birthday	230	126.10	39.16
Gr3PR_19_C	Sammy the Shark	231	143.02	45.36
Gr3PR_20_C	Mike's Red Sneakers	231	119.28	44.62

Results of Repeated Measures Analysis Across All 20 Passages

Grand Mean	Standard Error	95% Confidence Interval	
		Lower Bound	Upper Bound
124.55	2.60	119.43	129.68

Table 9
*Grade 3 Passage Reading Correlations between Passages ** p < .001*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1																			
2	.94** 239	1																		
3	.93** 239	.95** 240	1																	
4	.92** 238	.93** 239	.93** 240	1																
5	.92** 234	.91** 235	.92** 236	.91** 235	1															
6	.91** 235	.92** 236	.92** 237	.90** 236	.92** 242	1														
7	.92** 235	.92** 236	.93** 237	.90** 236	.92** 242	.93** 243	1													
8	.91** 235	.90** 236	.91** 237	.88** 236	.90** 242	.91** 243	.93** 243	1												
9	.92** 228	.92** 229	.91** 230	.89** 229	.91** 233	.90** 234	.93** 234	.92** 234	1											
10	.80** 228	.81** 229	.81** 230	.77** 229	.78** 233	.79** 234	.83** 234	.82** 234	.85** 238	1										
11	.82** 227	.83** 228	.82** 229	.82** 228	.81** 232	.81** 233	.86** 233	.83** 233	.86** 237	.91** 239	1									
12	.84** 228	.84** 229	.84** 230	.82** 229	.81** 233	.82** 234	.86** 234	.83** 234	.87** 238	.92** 240	.94** 239	1								
13	.84** 224	.85** 225	.84** 226	.83** 225	.82** 229	.83** 229	.86** 229	.84** 231	.86** 233	.89** 232	.93** 233	.92** 233	1							
14	.84** 224	.85** 225	.84** 226	.83** 225	.82** 228	.84** 229	.87** 229	.85** 229	.87** 231	.91** 233	.93** 232	.92** 233	.94** 237	1						
15	.79** 224	.82** 225	.80** 226	.78** 225	.77** 228	.80** 229	.82** 229	.81** 229	.84** 231	.87** 233	.90** 232	.90** 233	.94** 237	.93** 237	1					
16	.83** 223	.85** 224	.83** 225	.81** 224	.80** 227	.82** 228	.84** 228	.83** 228	.85** 230	.89** 232	.93** 231	.92** 232	.94** 236	.93** 236	.93** 236	1				
17	.79** 219	.81** 220	.80** 221	.79** 220	.78** 224	.79** 225	.83** 225	.81** 225	.83** 223	.90** 225	.91** 224	.88** 225	.93** 225	.92** 225	.91** 225	.92** 224	1			
18	.82** 218	.83** 219	.83** 220	.81** 219	.79** 223	.81** 224	.84** 224	.82** 224	.85** 222	.89** 224	.91** 223	.91** 224	.92** 224	.92** 224	.89** 224	.90** 223	.90** 230	1		
19	.82** 219	.84** 220	.83** 221	.82** 220	.81** 224	.83** 225	.85** 225	.83** 225	.84** 223	.90** 225	.92** 224	.90** 225	.93** 225	.93** 225	.92** 225	.92** 224	.91** 231	.93** 230	1	
20	.83** 219	.84** 220	.84** 221	.83** 220	.82** 224	.83** 225	.87** 225	.84** 225	.86** 223	.92** 225	.94** 224	.92** 225	.94** 225	.94** 225	.92** 225	.93** 224	.93** 231	.94** 230	.95** 231	1

Table 10
Descriptive Statistics for Grade 4 Passage Reading Measures

Passage	Title	<i>n</i>	<i>M</i>	<i>SD</i>
Gr4PR_1_C	Birthday Surprise	207	134.82	35.00
Gr4PR_2_C	Amusement Park	208	139.96	37.74
Gr4PR_3_C	Farm Dog Goes to Town	208	135.29	36.77
Gr4PR_4_C	A Day of Celebration	208	137.56	38.45
Gr4PR_5_C	Billy's Garden with Grandpa	204	143.63	38.65
Gr4PR_6_C	Maria's Secret Friend	204	130.35	34.83
Gr4PR_7_C	Lisa Gets to Drive	204	139.11	42.22
Gr4PR_8_C	Toni the Shark	203	132.88	39.62
Gr4PR_9_C	Marta's New Sweater	203	139.84	41.27
Gr4PR_10_C	Back to School	203	132.83	38.68
Gr4PR_11_C	The Perfect Present	200	131.39	36.65
Gr4PR_12_C	The Perfect Assignment	200	136.51	40.32
Gr4PR_13_C	President David	198	141.40	38.44
Gr4PR_14_C	Above the Clouds	199	138.70	37.68
Gr4PR_15_C	Super Powers	198	131.42	38.79
Gr4PR_16_C	A Friend for Jared	199	131.19	42.27
Gr4PR_17_C	Fieldtrip to the Zoo	196	139.05	42.69
Gr4PR_18_C	Hurt Feelings	195	136.56	39.41
Gr4PR_19_C	Billy and Spike	195	135.96	44.92
Gr4PR_20_C	The Rainy Day Jar	195	136.76	43.55

<i>Results of Repeated Measures Analysis Across All 20 Passages</i>			
Grand Mean	Standard Error	95% Confidence Interval	
		Lower Bound	Upper Bound
136.81	2.78	131.34	142.29

Table 11
Grade 4 Passage Reading Correlations between Passages ** $p < .001$

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	1																			
2	.94**	1																		
	207																			
3	.92**	.93**	1																	
	207	208																		
4	.93**	.94**	.93**	1																
	207	208	208																	
5	.92**	.92**	.93**	.92**	1															
	202	203	203	203																
6	.91**	.90**	.91**	.93**	.91**	1														
	202	203	203	203	204															
7	.92**	.93**	.94**	.94**	.93**	.92**	1													
	202	203	203	203	204	204														
8	.92**	.93**	.93**	.94**	.93**	.92**	.95**	1												
	201	202	202	202	203	203	203													
9	.91**	.91**	.92**	.92**	.89**	.90**	.92**	.92**	1											
	201	202	202	202	202	202	202	202												
10	.83**	.85**	.88**	.86**	.86**	.85**	.88**	.89**	.87**	1										
	201	202	202	202	200	200	200	199	201											
11	.85**	.86**	.87**	.87**	.86**	.87**	.87**	.88**	.88**	.95**	1									
	197	198	198	198	196	196	196	195	197	199										
12	.85**	.87**	.88**	.87**	.87**	.86**	.89**	.89**	.87**	.95**	.94**	1								
	197	198	198	198	196	196	196	195	197	199	200									
13	.90**	.90**	.90**	.92**	.89**	.88**	.90**	.90**	.88**	.92**	.92**	.94**	1							
	195	196	196	196	193	193	193	192	193	195	196	196								
14	.84**	.87**	.85**	.88**	.83**	.85**	.87**	.86**	.84**	.89**	.90**	.91**	.91**	1						
	196	197	197	197	194	194	194	193	194	196	197	197	198							
15	.86**	.86**	.88**	.88**	.86**	.86**	.87**	.88**	.87**	.93**	.93**	.93**	.93**	.91**	1					
	195	196	196	196	193	193	193	192	193	195	196	196	197	198						
16	.85**	.87**	.86**	.89**	.85**	.86**	.87**	.88**	.85**	.92**	.92**	.93**	.93**	.92**	.95**	1				
	196	197	197	197	194	194	194	193	194	196	197	197	198	199	198					
17	.87**	.88**	.86**	.88**	.87**	.86**	.88**	.88**	.84**	.88**	.87**	.91**	.92**	.88**	.89**	.90**	1			
	193	194	194	194	191	191	191	191	191	193	190	190	190	191	190	191				
18	.87**	.88**	.88**	.89**	.88**	.88**	.90**	.89**	.86**	.90**	.91**	.93**	.92**	.90**	.91**	.92**	.93**	1		
	192	193	193	193	190	190	190	190	190	192	190	190	190	191	190	191	195			
19	.87**	.88**	.88**	.89**	.88**	.87**	.90**	.90**	.87**	.91**	.91**	.91**	.92**	.89**	.92**	.91**	.91**	.92**	1	
	192	193	193	193	190	190	190	190	190	192	190	190	190	191	190	191	195	195		
20	.87**	.86**	.87**	.89**	.88**	.87**	.88**	.89**	.85**	.91**	.90**	.92**	.91**	.89**	.92**	.92**	.91**	.93**	.92**	1
	192	193	193	193	190	190	190	190	190	192	190	190	190	191	190	191	195	195	195	

Discussion

Creating Alternate Forms of the Word Reading Fluency Measures

Using results of the pilot testing, we divided all words from the item bank into four bands of difficulty from which to draw words for the forms of the test at the four grade levels. In all cases, we included an overlap of items from the different grade levels to extend the range of item measures represented on the test forms. We used this information to draw items to create 20 alternate forms of the Progress Monitoring Word Reading Fluency measures in Kindergarten through third grade. In all cases, we drew from the easiest items in the item bank to create the first few rows of items and drew from increasingly challenging items to complete the forms. In all cases, we selected items on alternate forms with comparable measures to create alternate forms with comparable difficulties, not only across the form as a whole, but also across each row. This organization is especially important because as fluency-based measures, the final forms must reflect similar rates of increasing difficulty to allow for comparable interpretation across forms.

This process resulted in 20 comparable forms, with 60 items each, at each of the four grade levels. For the Student Form of the measures, we used size 24 Times font (see Appendix B). The Assessor Copy of each of the forms includes administration and scoring directions as well as a smaller version of the student measure (see Appendix C).

Creating Alternate Forms of the Passage Reading Fluency Measures

We used the information about passage difficulty to modify the passages and bring them into closer alignment. First, we identified the nine passages that were most similar in difficulty. Then, we increased the difficulty of the passages that were too easy (based on more average words read correctly than the other passages included in the pilot testing) and decreased the difficulty of the passages that were too challenging (based on fewer average words read correctly than the other

passages included in the pilot testing). The changes made to the first-grade passages are indicated in Table 10. Changes made to second-grade passages are listed in Table 11. Table 12 lists changes made to the third-grade passages, and Table 13 lists changes made to the fourth-grade passages.

Table 10

Changes Made to Grade 1 Passage Reading Measures

Passage	Title	Changes Made	New Number
Gr1PR_1_C	The New Puppy	No changes	Gr1PR1
Gr1PR_2_C	Ice Cream Treat	No changes	Gr1PR10
Gr1PR_3_C	Patty the Pig	Simplified by changing “Patty” to “Pat”, and all references to ‘she’ to ‘he’, ‘her’ to ‘his’	Gr1PR11
Gr1PR_4_C	The Dog Show	No changes	Gr1PR2
Gr1PR_5_C	Trains	Simplified by changing ‘railroad’ to ‘train’	Gr1PR12
Gr1PR_6_C	The Best Story Ever	Made slightly more complex by changing ‘best’ to ‘most amazing’	Gr1PR13
Gr1PR_7_C	Making a Pizza	Made more complex by adding ‘for her whole family’, ‘exactly’, ‘promised’, and changing ‘great’ to ‘wonderful’	Gr1PR14
Gr1PR_8_C	Ocean Fish	No changes	Gr1PR3
Gr1PR_9_C	The Puppy	No changes	Gr1PR4
Gr1PR_10_C	The Airplane Ride	Made slightly more complex by adding ‘finally’ and changing ‘put on’ to ‘fasten’	Gr1PR15
Gr1PR_11_C	The Story for Mom	No changes	Gr1PR5
Gr1PR_12_C	Loose Tooth	Simplified by changing ‘excited’ to ‘happy’, ‘wiggled’ to ‘moved’, ‘weird’ to ‘funny’	Gr1PR16
Gr1PR_13_C	A Prized Garden	No changes	Gr1PR6
Gr1PR_14_C	The Lake	Simplified by changing ‘Kendra’ to ‘Kim’, ‘Bret’ to ‘Joe’, ‘bathing suit’ to ‘swimsuit’	Gr1PR17

Table 10
Changes Made to Grade 1 Passage Reading Measures (Continued)

Passage	Title	Changes Made	New Number
Gr1PR_15_C	The Swing	Made more complex by changing ‘liked swinging the best’ to ‘particularly liked swinging’, adding ‘neighborhood’ in front of ‘park’	Gr1PR18
Gr1PR_16_C	Play Ball	No changes	Gr1PR7
Gr1PR_17_C	Sick Day	No changes	Gr1PR8
Gr1PR_18_C	Hannah the Hamster	Made slightly more complex by adding ‘puffy’ and combining two short sentences into a longer one.	Gr1PR19
Gr1PR_19_C	Playful Sam	No changes	Gr1PR9
Gr1PR_20_C	The Fair	Made slightly more complex by changing ‘night’ to ‘evening’, ‘one’ to ‘eight’, ‘red’ to ‘orange’, adding ‘along’,	Gr1PR20

Table 11
Changes Made to Grade 2 Passage Reading Measures

Passage	Title	Changes Made	New Number
Gr2PR_1_C	Ebony	Simplified by changing ‘shiny’ to ‘very nice’, ‘patches of sunshine’ to ‘the warm sun’, ‘glistened’ to ‘was very soft’, ‘sometimes’ to ‘on some days’,	Gr2PR10
Gr2PR_2_C	Jessie’s Adventure	No changes made	Gr2PR1
Gr2PR_3_C	Emily’s Day at Home	Made more complex by changing ‘was’ to ‘worked as’, adding ‘elementary school’ in front of ‘teacher’, ‘told her’ to ‘explained’, ‘stayed’ to ‘remained at’	Gr2PR11
Gr2PR_4_C	Jake’s New Bike	Simplified by changing ‘excited’ to ‘happy’, removing the word ‘seventh’, changing ‘promised’ to ‘send they would give him’, ‘beamed’ to ‘grinned’	Gr2PR12

Table 11
Changes Made to Grade 2 Passage Reading Measures (Continued)

Passage	Title	Changes Made	New Number
Gr2PR_5_C	Moving to a New House	No changes	Gr2PR2
Gr2PR_6_C	The Magic Show	No changes	Gr2PR3
Gr2PR_7_C	Music	Simplified by changing ‘playing’ to ‘to play’, ‘piano’ to ‘drums’, ‘regularly’ to ‘all the time’, ‘practiced’ to ‘played music’, re-arranged some sentences to make them more simple in structure, ‘muscles’ to ‘arms’, ‘stretch’ to ‘move’	Gr2PR13
Gr2PR_8_C	The Fastest Bird	No changes	Gr2PR4
Gr2PR_9_C	Baking Cookies	Made more complex by changing ‘day’ to ‘afternoon’, adding ‘absolutely’ in front of ‘loved to eat’, changing ‘grandma’ to ‘grandmother’, adding ‘laughed, then she’ in front of ‘smiled’, changing ‘great’ to ‘wonderful’	Gr2PR14
Gr2PR_10_C	No More School	Simplified by changing the wording around to make sentence structure more simple, changing ‘sufficient’ to ‘too much’, and replacing many higher-level vocabulary words with much simpler ones.	Gr2PR15
Gr2PR_11_C	Summer Cash	No changes	Gr2PR5
Gr2PR_12_C	The Contest	Simplified by changing ‘express herself’ to ‘show how she feels’, ‘create’ to ‘make’, ‘make a piece of art about the earth and pollution’ to ‘paint a picture about taking care of the world around us’, several other phrasing changes to change the word ‘earth’ to ‘world’	Gr2PR16
Gr2PR_13_C	Salty Breakfast	Simplified by changing ‘clever’ to ‘funny’, adding ‘liked to’ in front of ‘put’, changing ‘smiling’ to ‘smile’, ‘practicing the piano’ to ‘she had to do some work’, ‘for themselves’ to ‘on their own’, ‘ingredients’ for ‘things they needed’	Gr2PR17

Table 11
Changes Made to Grade 2 Passage Reading Measures (Continued)

Passage	Title	Changes Made	New Number
Gr2PR_14_C	The Winter Play	No changes	Gr2PR6
Gr2PR_15_C	Time for Bed	No changes	Gr2PR7
Gr2PR_16_C	Emily’s New Bike	No changes	Gr2PR8
Gr2PR_17_C	Soccer Ball	Made more complex by changing ‘pro’ to ‘professional’, adding ‘absolutely’, changing ‘thinking’ to ‘fantasizing’	Gr2PR18
Gr2PR_18_C	The Spelling Bee	Simplified by adding ‘a student’, changing ‘she studies all the time’ to ‘she loves to learn new words each week’, ‘Thursday’ to ‘Monday’, ‘county’ to ‘state’, ‘is nervous’ to ‘can not wait’, ‘especially nervous about Grant’ to ‘wants to try to beat Grant’, ‘quiz’ to ‘help’	Gr2PR19
Gr2PR_19_C	Tom’s Team	No changes	Gr2PR9
Gr2PR_20_C	Brian’s Dream	Simplified by changing ‘Brian’ to ‘Tom’, splitting up a long sentence into three short ones, changing ‘fifth grade’ to ‘first grade’, ‘usually tripped’ to ‘fell down’,	Gr2PR20

Table 12
Changes Made to Grade 3 Passage Reading Measures

Passage	Title	Changes Made	New Number
Gr3PR_1_C	Susan’s New School	No Changes	Gr3PR1
Gr3PR_2_C	Sara’s Fun Visit	No Changes	Gr3PR2
Gr3PR_3_C	Horses at the Fair	No Changes	Gr3PR3
Gr3PR_4_C	Ben’s Truck	No Changes	Gr3PR4
Gr3PR_5_C	Surprise Sandwiches	No Changes	Gr3PR5

Table 12

Changes Made to Grade 3 Passage Reading Measures (Continued)

Passage	Title	Changes Made	New Number
Gr3PR_6_C	Swimming	No Changes	Gr3PR6
Gr3PR_7_C	Boring Weekends	Simplified by changing “dreads” to “does not like”, “discouraged” to “sad”, “cannot” to “can’t”, added “fun” in front of “anything”,	Gr3PR10
Gr3PR_8_C	Birthday Wishes	No Changes	Gr3PR7
Gr3PR_9_C	A Special Bike	No Changes	Gr3PR8
Gr3PR_10_C	The New Puppy	Simplified by changing “Dana” to “Dora”, Split the first line into 2 short sentences, changed “comfortable bed” to “soft warm”, “neighbors” to “people when they walk by”, “completely” to “really”, “unsure of how” to “not sure how”	Gr3PR11
Gr3PR_11_C	Childhood Dreams	Simplified by making many changes in wording (using several small words in place of one long one)	Gr3PR12
Gr3PR_12_C	The Perfect Instrument	Simplified by changing “play an instrument” to “play some kind of music”, “saxophone” to “sax”, “suggested” to “told him he should pick”, “remarkable” to “beautiful”	Gr3PR13
Gr3PR_13_C	The Breaking Story	Simplified by changing “Brian” to “Matt”, “an interesting topic” to “something to write about”, “cannot” to “can’t”,	Gr3PR14
Gr3PR_14_C	The Dream House	Simplified by changing “Jeff” to “Ed”, several other changes	Gr3PR15
Gr3PR_15_C	American Sports	Simplified by changing “Misha” to “Min”, changing “hockey” to “basketball”, “tomatoes” to “salsa”, “disgusting” to “gross”, “was excited” to “wanted to”	Gr3PR16
Gr3PR_16_C	The Backpacking Trip	Simplified by changing “Aram” to “Erik”, “exciting” to “big”, “wilderness” to “mountains”	Gr3PR17

Table 12

Changes Made to Grade 3 Passage Reading Measures (Continued)

Passage	Title	Changes Made	New Number
Gr3PR_17_C	The Garden	Simplified by changing “tomatoes” to “beans”, “the scent of bluebells” to “the way roses smell”	Gr3PR18
Gr3PR_18_C	Abby’s Birthday	No Changes	Gr3PR9
Gr3PR_19_C	Sammy the Shark	Complexified by changing “Sammy” to “Alexander”, “big” to “enormous”, “help” to “rescue”, and added the word “sometimes”	Gr3PR19
Gr3PR_20_C	Mike’s Red Sneakers	Simplified by changing ‘sneakers’ to ‘shoes’, line 1; ‘although’ to ‘even though’, ‘discovered’ to ‘told him’	Gr3PR20

Table 13

Changes Made to Grade 4 Passage Reading Measures

Passage	Title	Changes Made	New Number
Gr4PR_1_C	Birthday Surprise	Simplified by changing “belongings” to “things”, “cozy” to “soft”, and “unique” to “special”	Gr4PR10
Gr4PR_2_C	Amusement Park	No Changes	
Gr4PR_3_C	Farm Dog Goes to Town	Simplified by changing “her siblings” to “other dogs”, “eight” to “nine”, and “arrived at” to “came to” and split the first sentence of paragraph 2 into two sentences.	Gr4PR11
Gr4PR_4_C	A Day of Celebration	No Changes	
Gr4PR_5_C	Billy’s Garden with Grandpa	Made more challenging by changing “not sure” to “not exactly sure how they should”, added “together”, changed “cycling” to “bicycling”, “great” to “magnificent” and “fun” to “amusing”	Gr4PR12

Table 13

Changes Made to Grade 4 Passage Reading Measures (Continued)

Passage	Title	Changes Made	New Number
Gr4PR_6_C	Maria's Secret Friend	Simplified by changing "listener" to "friend", "never interrupt Maria" to "never ask Maria to stop talking", "enjoyed" to "loved", "soon Maria realized" to "Of course,"	Gr4PR13
Gr4PR_7_C	Lisa Gets to Drive	No Changes	
Gr4PR_8_C	Toni the Shark	Simplified by changing "adored" to "loved", "observe" to "check out", "admiring" to "watching", "hovered" to "stayed", "venture" to "go", "eventually" to "after many hours"	Gr4PR14
Gr4PR_9_C	Marta's New Sweater	No Changes	
Gr4PR_10_C	Back to School	Simplified by changing quite a bit of the phrasing.	Gr4PR15
Gr4PR_11_C	The Perfect Present	Simplified by changing quite a bit of the phrasing as well as more challenging vocabulary.	Gr4PR16
Gr4PR_12_C	The Perfect Assignment	No Changes	
Gr4PR_13_C	President David	Made more challenging by changing "help" to "assist", "have" to "institute". Added "in the upcoming election"	Gr4PR17
Gr4PR_14_C	Above the Clouds	No Changes	
Gr4PR_15_C	Super Powers	Simplified by changing "homework assignment" to "thing to do for homework", "the assignment" to "what he would write", "interesting" to "fun", "faster than lightning" to "faster than a car"	Gr4PR18
Gr4PR_16_C	A Friend for Jared	Simplified by changing "Mrs." to "Mr.", "his peers" to "other students", "Jared's peers" to "other students", "Jared" to "Lee", "reality" to "truth", "actually" to "just", "conceive" to "think"	Gr4PR19

Table 13

Changes Made to Grade 4 Passage Reading Measures (Continued)

Passage	Title	Changes Made	New Number
Gr4PR_17_C	Fieldtrip to the Zoo	No Changes	
Gr4PR_18_C	Hurt Feelings	No Changes	
Gr4PR_19_C	Billy and Spike	Simplified slightly by changing “extremely energetic” to “very happy”, “leaped’ to “jumped”	Gr4PR20
Gr4PR_20_C	The Rainy Day Jar	No Changes	

This process resulted in 20 comparable forms at each of the four grade levels. For the Student Form of the measures, we used size 13 Comic Sans MC font (see Appendix D). The Assessor Copy of each of the forms includes administration and scoring directions as well as a smaller version of the student measure (see Appendix E). All forms of the measures were then loaded to the EasyCBM website for web-based access.

Appendix A

Test Specifications for Creating Passage Reading Fluency Measures

Instrument Development: ORF Passages

Goal: To develop a series of reading assessments that can be used for progress monitoring and tracking RTI data for 1st- through 4th-grade students at risk for reading failure.

Overall Task : Write 25 ORF passages (each 250 words long) for 1st, 2nd, 3rd, and 4th-grade students (for a total of 100 ORF passages).

Grade 1 ORF passages should be written at a 1.5 grade level.

Grade 2 ORF passages should be written at a 2.5 grade level.

Grade 3 ORF passages should be written at a 3.5 grade level.

Grade 4 ORF passages should be written at a 4.5 grade level.

- Each ORF passage should ‘stand alone’ with no reference to any other ORF passage.
- Each ORF passage should tell a story.
- ORF passages should contain no dialogue.
- Give each ORF passage an appropriate title.
- Include Word Count, on each ORF passage.
- Email each ORF passage to me AS SOON AS YOU COMPLETE IT so I can keep track of our overall numbers.

I’ve provided an example ORF passage from each of the grade levels we’re writing them for on the next few pages of this document. Please familiarize yourself with the basic format / approach, and then jump right into writing!

Thank you!

--Julie

Appendix B

Example Word Reading Test: Student Copy

I	the	it	and
sun	he	fast	will
but	car	too	you
feet	book	sum	work
look	bill	fly	before
end	family	under	other
six	yard	here	that
soon	may	took	girl
open	street	told	clean
might	rain	new	yellow
game	nothing	move	maybe
until	inside	who	every
wall	step	watch	river
hair	plant	rich	there
mouth	dark	together	trouble

Appendix C

Example Word Reading Fluency Test: Assessor Copy

Procedures: Place the student copy of the Word Reading test in front of the student. Say, “**Please read from this list of words. Read across the page and then on to the next row.**” (Demonstrate by sweeping your finger from left to right across the first row and then sweeping across the second row of words.) Start the 30-second timing when the student starts reading. Mark a bracket] after the last word read in 30 seconds.

If the student self corrects, write *s.c.* above the word and count it as correct. If the student says the incorrect word, mark a slash through the word, and count it as incorrect. If the student hesitates more than 3 seconds, supply the word and count it as incorrect. If the student skips a word, circle the word and count it as incorrect.

Note: This is a 30 second timed test.

I	the	it	and
sun	he	fast	will
but	car	too	you
feet	book	sum	work
look	bill	fly	before
end	family	under	other
six	yard	here	that
soon	may	took	girl
open	street	told	clean
might	rain	new	yellow
game	nothing	move	maybe
until	inside	who	every
wall	step	watch	river
hair	plant	rich	there
mouth	dark	together	trouble

Total Word List Correct: ____ /60

Appendix D

Example First Grade Passage Reading Fluency Test: Student Copy

Ann was seven years old. Her brother Tom was nine. They were both very excited. Today they were going to get a pet. They were going to get a puppy. Ann hoped their new puppy would like to chase balls. She wanted to play with it in the yard. She thought it would be fun to play chase with the puppy. Tom hoped their new puppy would like to go for walks in the park. He wanted to take it for walks with his friends and their dogs. Both children knew that taking care of a puppy could be a lot of work. They promised their mom they would be good pet owners.

It was time to go pick out their new puppy. Ann, Tom, and their mom got in the car. They drove to the animal shelter in town. They parked the car and went inside. Ann and her brother knew where to go. They had visited the shelter before. They came to the shelter last year. They had adopted a cat there.

Ann and Tom rushed into the main office area. They went to the part of the shelter with dogs. The words Dog Kennel were written on the wall. They saw two rows of metal cages. There was a cement hall in between them. They could hear many dogs barking. The dogs were barking loudly. Ann and Tom looked at each other. They smiled big smiles. They knew they would find their new pet.

Appendix E

Example First-Grade Passage Reading Fluency Test: Assessor Copy

1. Place the passage without numbers in front of the student and say:

“I want you to read this story to me. You’ll have 1 minute to read as much as you can. When I say “begin,” start reading aloud at the top of the page. Do your best reading. If you have trouble with a word, I’ll tell it to you. Do you have any questions? Begin.”

2. Start the timer.
3. While the student is reading, mark errors with a slash (/).
4. At 1 minute, say “**stop.**”
5. Mark the last word read with a bracket (]).

Ann was seven years old. Her brother Tom was nine. They were both very	14
excited. Today they were going to get a pet. They were going to get a puppy. Ann	31
hoped their new puppy would like to chase balls. She wanted to play with it in the	48
yard. She thought it would be fun to play chase with the puppy. Tom hoped their	64
new puppy would like to go for walks in the park. He wanted to take it for walks	82
with his friends and their dogs. Both children knew that taking care of a puppy	97
could be a lot of work. They promised their mom they would be good pet owners.	113
It was time to go pick out their new puppy. Ann, Tom, and their mom got in	130
the car. They drove to the animal shelter in town. They parked the car and went	146
inside. Ann and her brother knew where to go. They had visited the shelter before.	161
They came to the shelter last year. They had adopted a cat there.	174
Ann and Tom rushed into the main office area. They went to the part of the	190
shelter with dogs. The words Dog Kennel were written on the wall. They saw two	205
rows of metal cages. There was a cement hall in between them. They could hear	220
many dogs barking. The dogs were barking loudly. Ann and Tom looked at each	234
other. They smiled big smiles. They knew they would find their new pet.	247

Total Words Read: _____ # of Errors: _____ Raw Score: _____

Calculated Score: _____ *

*This score is computed automatically when you enter the other scores online. It is the most accurate score to use for tracking student learning because it adjusts for differences in difficulty between passages.

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