

Section 6, Chapter 45:

How to Evaluate Your Present Spelling Program

Do we *really* need a different spelling program? How can we determine whether or not Brand X Spelling by Famous Publishers is as good as its hype? Does any spelling program really work? These and a few other questions should automatically come to mind if you are a principal, a member of a spelling curriculum committee, or a teacher concerned about helping your students become adequate spellers.

You can read the latest studies and you can read all the official data put out by publishers, but will all this reading really give you the answers to the important questions? We at AVKO don't think so. We have read the studies. We have looked at all kinds of spelling programs. We have read their propaganda sheets. And because we are a non-profit organization dedicated to finding solutions to educational problems, we have designed a method that any school can use to test the effectiveness of their current spelling program or to compare various spelling programs being used within their system.

We can do it for you. But we'd have to charge an arm and a leg and perhaps a finger and toe on top of that. So, I'm sure you'd rather have a system you could follow that would answer those crucial questions.

It's cost? Two sheets of paper per student, one sheet of paper with the spelling test for each teacher, and about two minutes of some reliable spelling checker's time per student tested, another minute per student for a data entry person to compile the data and perhaps four hours tops for the person in charge to write the report, plus perhaps eight to twenty hours for someone to design the test and prepare the teachers involved in how to administer it.

Before we tell you how it should be done we would like to point out the pitfalls of standard methods of evaluation of spelling.

1. Spelling tests too often measure students' short term memories and not their permanent memories.
2. Standardized spelling tests are not designed to discriminate between *incidental* learning of spellings and the learning of spellings that can be directly attributed to the teaching of spelling. By incidental learning of spelling we mean such learning that may take place just from reading, from having spelling errors in papers corrected, by using the dictionary, by asking for correct spellings, etc.

To overcome the first problem, we believe that the best way to test students' spellings of words is to have the pretest done on the first day of school in September and the posttest done on the first day of school in September of the following year.

To overcome the second problem of being able to determine the actual amount of learning that can be attributed to the spelling program as compared to incidental learning, we recommend using *the paired word approach*. We take two sets of words. Each word in Set A is paired with a word of exactly the same level of difficulty in Set B. The difference between them will be that only the words in Set A were directly taught as part of the spelling program. The words in Set B were not taught.

Without the paired word approach many spelling programs will show false positive gains. For example, Brand X shows statistical evidence claiming that 90% of the students tested on the words *ship*, *little*, and *show* could spell these words as the result of their third grade spelling program. What they are not telling you is that if the school was just an average school 49% of the students already knew *ship* before they started the 3rd grade, 65% already could spell *little*, and 58% could spell *show*. And if the school is just an average school, 71% of the students would be able to spell *ship* at the end of

the 3rd grade **without** any special instruction on that word and 86% would be able to spell *little* and *show*.

Now this might be significant to a statistician, but it certainly is NOT significant in terms of instruction because **with or without any special instruction 99%** will eventually learn all three of these words *ship*, *little* and *show* before they get out of middle school anyway.

Before a school switches to Brand X Spelling (or even to AVKO's Sequential Spelling Series)⁶⁰, a school should determine several things.

1. The definition of an Effective Spelling Program (ESP) should be agreed upon. Teachers could decide that for a spelling program to be effective a *certain* percentage of the students who did **not** know how to spell a given word at the beginning of the program should, as a result of direct instruction, be able to spell that word one year later. That certain percentage could be: (a) 10% (b) 25% (c) 33% (d) 50% (e) 67% (f) 75% (g) 90%. It is crucial to determine what constitutes an effective program first and then to test it. You should never test the program first and then establish your effectiveness criteria.

2. Does the spelling program improve a student's ability to read? Remember, the decoding processing is merely the flip side of the encoding process. Pretests and posttests using standardized measures and control groups can determine this. Your local statistician should know how to set it up; if not, your nearest university will be able to help you.

3. Is the spelling program designed to help improve students' handwriting? Is the handwriting program designed to improve spelling? Is the composition program designed to help improve both spelling and handwriting?

Thanks to the most complete study of the spellings of school children by Harry A. Greene called the *New Iowa Spelling Scale*,⁶¹ we can use "baseline" words to determine the amount (if any) of improvement in spelling that can be attributed to the classroom study of spelling words.

For example, we know from this study that we can expect in a mythically average school that in September only 16% of the average 5th grade students can spell the word *marriage*. We can expect 27% to correctly spell marriage in September of the 6th grade. We can expect 52% by the 7th grade and 63% by the 8th. **If** the word *marriage* were to have been taught in your school's spelling series during the 5th grade, you would expect that far more than 27% should be able to spell it in the 6th grade. If not, then the old learn-for-the-test-on-Friday and forget-by-Monday syndrome is working.

We have rearranged *The New Iowa Spelling Scale*⁶² so that any local curriculum coordinator or statistician can construct a test to determine how effective your spelling series is. The test would use two sets of words. One set of words would be words that have been studied. The other set of words would be words of exactly the same statistical level of difficulty that had not been studied. If your spelling program is truly effective then there should be a readily recognizable difference between the scores, not just merely a statistically significant difference. Statisticians may believe an increase of 5% over an expected 10% gain is significant, but it would hardly justify the expense of most spelling programs. However, the amount of gain you expect to receive is something **you** should determine **BEFORE** you give the test.

⁶⁰This we humbly suggest is better than any spelling series on the market, but not nearly as good as a spelling program that can be designed by each teacher using the principles of AVKO's Sequential Spelling in conjunction with an overall curriculum program designed to fit the needs of the students.

⁶¹This has recently been revised by Bradley M. Loomer.

⁶²Greene, Harry. Revised by Bradley M. Loomer. *The New Iowa Spelling Scale*. Iowa City: University of Iowa, Project Spelling, 1978

Sample Construction of the Test

A 20 matched pair word test should be sufficient. The odd numbered words should be those words that are to be studied in the coming year. The even numbered words should be words that have not been studied in any previous year and are not scheduled to be studied in the coming year. They can, of course, be slated for study in following years. Obviously each grade should have a separate pretest. The pretests should be given to every student from grades 3 through 7 on the first day of school. The posttests will be exactly the same but given to grades 4 through 8 on the first day of the following school year.

Words 1-4 should be very easy words. That is, they should be correctly spelled by 96-100% of all 8th graders.

Words 5-8 should be relatively easy words. That is, they should be correctly spelled by 90-95% of all 8th graders.

Words 9-12 should be easy words known by 80-89% of all 8th graders.

Words 13-16 should be fairly hard words known only by 61-79% of all 8th graders.

Words 17-20 should be difficult words known only by 40-60% of all 8th graders.

There isn't anything sacred about the percentages shown above. What is sacred is choosing matched pairs of words from different levels of difficulty and always progressing from the easiest to the most difficult. The following is a sample test we constructed for a school system to test the effectiveness of their spelling program..

Column A Words Studied	Column B Words not studied
1. sport (98)	2. race (98)
3. wire (97)	4. wool (98)
5. member (93)	6. lesson (93)
7. jail (92)	8. leap (92)
9. torn (87)	9. sort (87)
11. regular (86)	12. regulations (86)
13. producing (84)	14. limb (84)
15. quiet (74)	16. minute (74)
17. instant (70)	18. neglect (70)
19. journal (53)	20. particulars (53)

Certainly if the spelling program is working, we would expect many more words in Column A would be correctly spelled than column B. We would think that an ordinary spelling program of moderate effectiveness would result in 25% more correct spellings of words studied than those not studied. A truly Effective Spelling Program (ESP) should have at least 75% more correct spellings of words studied than those not studied. The instrument we give teachers contains the word and a sentence in which it occurs, and then the word repeated one more time. Directions are that teachers may repeat the word, the sentence and the word one more time only. If a teacher wants to check her/his own spelling program first before trying to convince the school system to do a system or school wide testing, she/he should give the pretest on the first day of school with the words being taught coming from the first two months of the school year and the posttest being given late in the spring.

So, use any grouping of the following paired words to devise your own test of your spelling system's effectiveness. The paired words in this pamphlet are arranged from "easiest" to "hardest."

We used the statistics from *The New Iowa Spelling Scale*.⁶³ The only real change we made was to also add the percentage figures from the 5th through 8th grades for a total of the number out of an average 400 students who could correctly spell the words. The pairs were “picked” by the “computer” but they do seem to indicate something about how spelling is and isn’t taught across the country.

Steps to follow (Summarized)

- Step 1.** Let teachers determine what percentage of students who don’t know a word on pretest should be able to spell the word a year later if that word is directly taught. In other words, what percentage of learning constitutes an Effective Spelling Program (ESP). See sample survey questionnaire below..
- Step 2.** Let local spelling committee create Pretest using paired words of equal difficulty. See sample pretest on p. 243
- Step 3.** Have teachers give pretest on 1st day of school.
- Step 4.** Have designated scorer (not the teachers) correct tests and complete Pretest score sheet. See sample score sheet on p. 244.
- Step 5.** Have designated analyst determine (a) expected gains from incidental learning and (b) expected gains from direction instruction of an Effective Spelling Program (ESP).
- Step 6.** Have teachers use their spelling program for the year.
- Step 7.** Have teachers give the Posttest on 1st day of school (the following year)
- Step 8.** Have designated scorer (not the teachers) correct tests and complete Posttest score sheet.
- Step 9.** Have designated analyst determine gains and compare real gains to the minimum score projected for an Effective Spelling Program (ESP). See p. 245.
- Step 10.** Have analyst present findings to Spelling and Curriculum Committees and teachers.

Steps to follow (in greater detail)

Step #1. Let teachers determine what constitutes effective learning.

Questionnaire for Teachers:

For you to consider a spelling program to be **effective**, what percentage of students who were **not** able to spell a specific spelling program word at the beginning of the year **should be able** to demonstrate that they have learned to spell that same word correctly the following year? Circle one: A—10%. B—20%. C—25%. D—33% E—50%. F—67%. G—75%. H—80%. I—90%

Tabulate your teachers’ responses. Pick the percentage that appears to be the concensus. Use this figure to determine the effectiveness of the program. For purposes of explanation, we assume 75% would be the passing grade selected by most teachers for a spelling program developed by experts.

Goals to be expected by Effective Spelling Program (ESP). _____

Step #2. Create Pretest using paired words of equal difficulty. Use odd numbers for words that are being studied. Use even numbers for words that are not being studied. Write directions for the teachers. Include in the directions the words and the sentences using the words as in the sample below.

Step #3. Give the pretest.

⁶³Greene, Harry. Revised by Bradley M. Loomer. *The New Iowa Spelling Scale*. Iowa City: University of Iowa, Project Spell-

Sample Teacher's Sheet (the pretest)⁶⁴

Hand out the student answer sheets and tell the students that they are going to help their school test their spelling books. Tell them to do their best but not to worry. They are not going to be graded on this test. Read the word. Read the sentence and read the word one more time. If a student needs to have it repeated, you may repeat the word, the sentence and the word but only repeat once.

1.	time	It's not time to go yet. time.
2.	love	I just love taking a test that's easy. love.
3.	milk	You should drink some milk everyday. milk.
4.	May	The month of May follows April. May.
5.	toe	I stubbed my toe against the step. toe.
6.	singing	I enjoy singing folk songs. singing.
7.	learn	This year you will learn many things. learn
8.	rented	We rented an apartment for a year. rented.
9.	tie	I hope you know how to tie your shoelaces. tie.
10.	helped	A boy scout would have helped them. helped.
11.	porch	I enjoy sitting on a porch. porch.
12.	pretty	I think kittens are pretty cute. pretty.
13.	thinking	What were you thinking about? thinking.
14.	sank	The Titanic sank when it hit an iceberg. sank.
15.	victory	It was a great victory for our team. victory.
16.	serve	Who is going to serve the meal? serve.
17.	passage	We read a short passage from the book. passage.
18.	ironing	Do you have an ironing board at home? ironing.
19.	thrill	We got a thrill out of going on that ride. thrill.
20.	hundreds	It cost us hundreds of dollars to go there. hundreds.

Sentence dictation

Students are to write the entire sentence.

Repeat each sentence three times. Use normal "sloppy" speech.

Do NOT over articulate. Read going to as "gonna"!

- It's too bad their team is going to lose the big game.
- They're going to learn that it wasn't Coach Johnson's fault.
- Many students often find studying difficult.⁶⁵

ing, 1978.

⁶⁴This test can be used also as the posttest the following year.

⁶⁵Those students who **badly** misspell this sentence should be tested for learning disabilities, specifically dyslexia and/or dysgraphia. An example of such a bad misspelling would be: *Mene sutend ofen fine sudin difcault*

Step #4. Scorer completes Pretest Check Sheet.

**Sample Scorer's Pretest Check Sheets (Partially Completed).
Based on one small elementary school.**

	Grade 4 (68 students)			Grade 5 (67 students)		
	# Correct Spellings ⁶⁶	Divided by # Students	Percent Known	#Correct Spellings	Divided by # Students	Percent Known
1. time	_____	_____	_____	_____	_____	_____
2. love	_____	_____	_____	_____	_____	_____
3. milk	_____	_____	_____	_____	_____	_____
4. May	_____	_____	_____	_____	_____	_____
.....						
.....						
17. passage	14	÷ 68 =	21%	28	÷ 67 =	42%
18. ironing	15	÷ 68 =	22%	29	÷ 67 =	45%
19. thrill	_____	_____	_____	_____	_____	_____
20. hundreds	_____	_____	_____	_____	_____	_____
It's	_____	_____	_____	_____	_____	_____
too	_____	_____	_____	_____	_____	_____
bad	_____	_____	_____	_____	_____	_____
their	_____	_____	_____	_____	_____	_____
team	_____	_____	_____	_____	_____	_____
is	_____	_____	_____	_____	_____	_____
going to	_____	_____	_____	_____	_____	_____
lose	_____	_____	_____	_____	_____	_____
the	_____	_____	_____	_____	_____	_____
big	_____	_____	_____	_____	_____	_____
game.	_____	_____	_____	_____	_____	_____
They're	_____	_____	_____	_____	_____	_____
going to	_____	_____	_____	_____	_____	_____
learn	_____	_____	_____	_____	_____	_____
that	_____	_____	_____	_____	_____	_____
it	_____	_____	_____	_____	_____	_____
wasn't	_____	_____	_____	_____	_____	_____
Coach	_____	_____	_____	_____	_____	_____
Johnson's	_____	_____	_____	_____	_____	_____
fault.	_____	_____	_____	_____	_____	_____
Many	_____	_____	_____	_____	_____	_____
students	_____	_____	_____	_____	_____	_____
often	_____	_____	_____	_____	_____	_____
find	_____	_____	_____	_____	_____	_____
studying	_____	_____	_____	_____	_____	_____
difficult	_____	_____	_____	_____	_____	_____

Step 5. Analyst compares school's scores to national averages for each grade. If close as in our example, analyst uses the scale. If not, the analyst uses appropriate statistical interpolation to determine expected average gains from incidental learning.

⁶⁶Number of Correct Spellings divided by total students in grade=Percent correct

Predicted Percentage Scores from National Averages See pp. 248 & 248

	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
17. passage	21	45	68	79	88
18. ironing	23	46	66	79	88

In this case, to determine the expected gain from the target word⁶⁷ *passage*, analyst subtracts the percentage correct in the 4th grade (21) from the percentage correct in the 5th grade (45) to arrive at the expected gain for the target word *passage* of 24. The same procedure is used to determine the expected gain from incidental learning for the control word⁶⁸, *ironing*. See **Predicted Percentage Scores** bottom of page 247.

Step 7. Analyst determines what the score for each word should be on the posttest if the spelling program is effective. Formula he uses is:

Pretest score + minimum ESP Gain expected = minimum expected posttest score.

Example using statistics for the word **passage**

100%		100
minus beginning 4th Grade percentage (21%)		<u>-21</u>
equals percent who haven't yet learned		79
minus expected incidental	45	
learning gain score	<u>-21</u>	<u>-24</u>
equals percent who need to be taught		55
times effective teaching percent		<u>x.75</u>
Minimum Gain ABOVE expected		41

Minimum Percentage Score for a **75%** effective spelling program for the word **passage** studied in the 4th grade in the **posttest** given in grade 5 should be:

Score in 4th grade		21
Plus Incidental learning gain	24	
Plus Minimum Gain	<u>41</u>	+ 65
Minimum Score for 5th for 75% effective spelling program.		86

Step 8. The posttest is given the following September. As long as the pretests have been collected and never returned to the teacher, the same test can be used. Same directions.

Step 9. Analyst subtracts real score for each of the target words from the Minimum Score Projected for an Effective Spelling Program (ESP). See Sample Scorer's Posttest Check Sheets on p. 247.

Step 10. Analyst presents findings to the school's curriculum spelling subcommittee, the curriculum committee, and the teaching staff.

The chart, *Word Pairs of Equal Difficulty*, starting on page 248 contains a good sampling of equivalent word pairs of equal statistical difficulty.

⁶⁷The target word will be the word that will be studied sometime during the year.

⁶⁸The control word is the word that is almost identical in statistical difficulty but which will not be taught during the year.

If you would like to develop your own, you can find 5,508 words whose difficulty levels have been determined and in their rank order in the ***Reading Teacher's List of Basic Spelling Words*** which is available from the AVKO Foundation.

AVKO's predictions:

1. No matter how expensive your current spelling program is, it will be judged as ineffective by your teachers and your spelling committee if you use our simple test.
2. If your system uses the AVKO Sequential Spelling program that does not require any books for the students, the test results will satisfy your teachers and your spelling committee.
3. If your system uses the AVKO Sequential Spelling method and your teachers develop their own materials, the test results will more than satisfy your teachers and your spelling committee.

Sample Scorer's Posttest Check Sheets for just the 4th Grade based on one small middle school. Notice the pretest scores are for the lower of the two grades. The posttest scores are for the higher of the two. Posttest is taken 1st day of Grade 5.

→	Grade 4		Grade 5		Target +/-	
	Pretest Number correct	+ Expected Gain	ESP Score	Actual Correct		- Expected Score
1. time	_____	_____	_____	_____	_____	
2. love	_____	_____	_____	_____	_____	
3. milk	_____	_____	_____	_____	_____	
4. May	_____	_____	_____	_____	_____	
5. toe	_____	_____	_____	_____	_____	
6. singing	_____	_____	_____	_____	_____	
7. learn	_____	_____	_____	_____	_____	
8. rented	_____	_____	_____	_____	_____	
9. tie	_____	_____	_____	_____	_____	
10. helped	_____	_____	_____	_____	_____	
11. porch	_____	_____	_____	_____	_____	
12. pretty	_____	_____	_____	_____	_____	
13. thinking	_____	_____	_____	_____	_____	
14. sank	_____	_____	_____	_____	_____	
15. victory	_____	_____	_____	_____	_____	
16. serve	_____	_____	_____	_____	_____	
17. passage	21	65	86	46	86	-40
18. ironing	29	14	43	44	43	+1
19. thrill	_____	_____	_____	_____	_____	_____
20. hundreds	_____	_____	_____	_____	_____	_____
It's	_____	_____	_____	_____	_____	_____
too	_____	_____	_____	_____	_____	_____
bad	_____	_____	_____	_____	_____	_____
their	_____	_____	_____	_____	_____	_____
team	_____	_____	_____	_____	_____	_____
is	_____	_____	_____	_____	_____	_____
going to	_____	_____	_____	_____	_____	_____
lose	_____	_____	_____	_____	_____	_____
the	_____	_____	_____	_____	_____	_____
big	_____	_____	_____	_____	_____	_____
game.	_____	_____	_____	_____	_____	_____
They're	_____	_____	_____	_____	_____	_____
going to	_____	_____	_____	_____	_____	_____
learn	_____	_____	_____	_____	_____	_____
that	_____	_____	_____	_____	_____	_____
it	_____	_____	_____	_____	_____	_____
wasn't	_____	_____	_____	_____	_____	_____
Coach	_____	_____	_____	_____	_____	_____
Johnson's	_____	_____	_____	_____	_____	_____
fault.	_____	_____	_____	_____	_____	_____
Many	_____	_____	_____	_____	_____	_____
students	_____	_____	_____	_____	_____	_____
often	_____	_____	_____	_____	_____	_____
find	_____	_____	_____	_____	_____	_____
studying	_____	_____	_____	_____	_____	_____
difficult	_____	_____	_____	_____	_____	_____

Word Pairs of Equal Difficulty	Per cent who can correctly spell the word in September in Grades:							Average per cent Grades 5-6-7-8
	2	3	4	5	6	7	8	
is	89	94	95	97	100	100	100	99
if	83	94	96	99	99	99	100	99
time	34	82	92	98	99	99	100	99
love	31	78	95	98	99	99	100	99
show	14	58	86	94	96	98	99	97
same	15	67	85	94	96	98	99	97
little	32	65	86	93	97	97	99	97
house	32	56	80	94	95	98	99	97
times	18	57	78	93	96	98	98	96
line	17	55	84	94	96	97	98	96
milk	37	70	84	92	96	98	98	96
May	34	70	89	93	96	97	98	96
ship	10	49	71	90	95	98	99	96
save	9	50	73	91	94	98	99	96
law	6	33	70	88	97	97	99	95
June	6	39	63	92	94	96	99	95
take	16	58	80	89	93	96	99	94
just	12	55	82	90	92	96	99	94
walk	20	50	70	87	94	97	98	94
tip	17	50	71	89	92	97	98	94
stand	8	43	74	88	91	96	98	93
showing	9	50	73	88	92	95	98	93
trip	3	38	71	85	92	95	97	92
place	1	37	67	83	93	96	97	92
test	5	46	77	87	91	93	97	92
rent	9	39	66	83	92	96	97	92
soon	31	62	74	87	91	94	96	92
seed	20	57	77	87	91	94	96	92
race	4	32	60	82	92	95	98	92
sport	4	36	62	83	91	94	98	92
near	5	43	65	83	90	95	98	92
mile	4	46	58	84	90	94	98	92
wife	10	34	68	82	91	96	97	92
things	15	46	75	83	91	95	97	92
sir	6	38	60	81	91	97	97	92
sad	21	58	72	83	91	95	97	92
shop	11	43	73	86	90	94	96	92
sheep	6	49	62	86	89	95	96	92
yesterday	3	38	63	83	87	97	97	91
walking	8	39	64	81	90	96	97	91
toe	8	49	66	80	89	95	97	91
singing	9	49	65	78	91	95	97	91
killing	4	26	69	80	93	94	96	91
job	4	23	60	81	91	95	96	91
rope	5	40	69	80	91	95	96	91
reader	4	36	66	83	88	95	96	91

Word Pairs of Equal Difficulty	Per cent who can correctly spell the word in September in Grades:							Average per cent Grades 5-6-7-8
	2	3	4	5	6	7	8	
Monday	15	46	80	88	90	92	93	91
spelling	18	47	74	87	91	92	93	91
toys	40	78	81	87	89	93	94	91
uptown	10	47	70	85	89	94	94	91
somewhat	6	36	64	77	90	95	96	90
pray	7	35	64	80	90	92	96	90
tail	9	27	64	87	89	90	92	90
lad	16	38	67	82	89	90	92	88
many	17	57	68	79	87	93	95	89
puts	17	52	65	78	85	93	95	88
kids	9	30	62	78	89	92	93	88
schools	23	52	55	80	86	93	93	88
wave	5	38	64	81	87	91	93	88
making	10	36	66	81	86	91	93	88
wool	9	21	45	74	87	91	97	87
wire	3	17	50	76	85	91	97	87
seat	9	31	54	76	84	91	95	87
rivers	3	31	61	74	85	92	95	87
sorry	5	36	66	79	86	90	94	87
somehow	11	40	65	77	87	91	94	87
tie	13	36	68	77	86	91	94	87
helped	11	48	75	78	86	90	94	87
trail	n/a	13	47	77	85	90	94	87
study	1	19	57	77	84	91	94	87
plants	n/a	28	54	79	86	90	92	87
leaves	9	19	53	81	85	89	92	87
sometimes	13	45	63	76	84	92	94	87
pulling	4	28	64	75	85	92	94	87
mice	2	31	50	77	85	90	94	87
lord	8	39	60	76	84	92	94	87
learn	n/a	18	51	75	86	91	96	87
rented	1	17	47	75	84	92	96	87
places	2	24	45	71	89	93	93	87
reports	2	22	46	71	88	92	93	86
unhappy	3	25	57	81	83	89	92	86
plan	n/a	46	65	78	85	90	92	86
neat	8	35	61	79	82	91	92	86
mailing	2	24	56	77	83	91	92	86
runs	43	58	73	78	84	88	92	86
rides	10	37	61	78	84	88	92	86
spoke	3	22	62	75	85	90	94	86
stamps	4	22	52	73	85	90	94	84
meet	12	22	60	79	85	88	90	86
hogs	15	35	62	78	85	88	90	85
heads	5	22	51	73	85	90	93	85
stands	7	29	56	74	83	90	93	85
member	4	12	49	71	85	90	93	85
lesson	n/a	12	57	70	85	91	93	85

Word Pairs of Equal Difficulty	Per cent who can correctly spell the word in September in Grades:							Average per cent Grades 5-6-7-8
	2	3	4	5	6	7	8	
largest	1	12	49	76	79	89	95	85
suit	1	27	49	75	82	85	95	84
there	17	59	71	76	85	88	92	85
hold	12	50	65	75	85	89	92	85
thinking	1	28	48	73	83	90	92	85
sank	2	24	51	72	84	90	92	85
living	4	23	52	79	82	88	91	85
tame	5	43	64	77	82	87	91	84
lets	19	42	66	75	81	89	91	84
trunk	1	12	44	74	81	89	91	84
taking	4	35	70	72	84	89	90	84
schoolhouse	13	33	64	73	84	88	90	84
raining	9	41	63	77	82	88	89	84
lark	4	21	52	75	84	87	89	84
stuck	2	22	45	69	85	89	94	84
smaller	6	21	49	70	84	89	94	84
pounds	1	23	45	68	81	89	95	83
pea	9	22	49	71	79	88	95	83
plane	5	32	55	73	81	86	91	83
lamps	6	33	57	73	81	86	91	83
pure	3	16	41	64	81	91	94	83
painted	3	14	39	67	79	90	94	83
range	1	11	38	68	76	89	95	83
teachers	1	15	49	67	77	89	95	82
leap	1	21	52	71	78	90	92	83
jail	3	17	51	70	81	88	92	83
shows	5	43	57	76	82	83	85	82
tiger	2	28	56	75	82	84	85	82
sixth	7	29	56	67	82	88	92	82
proved	1	18	32	67	82	88	92	82
sailed	2	14	42	67	79	87	93	82
ocean	n/a	7	37	67	79	87	93	82
twice	2	15	46	69	79	86	88	81
tools	4	28	45	69	79	86	88	81
wore	4	23	50	66	78	88	90	81
snowballs	4	24	55	66	78	88	90	81
sizes	n/a	13	40	66	81	87	91	81
races	2	17	45	66	82	86	91	81
wrong	2	11	36	62	80	88	93	81
turned	2	21	49	64	79	87	93	81
pile	4	25	49	68	75	86	91	80
ours	8	36	49	69	75	85	91	80
pocket	n/a	9	46	68	76	87	89	80
iron	1	8	42	67	78	86	89	80
police	n/a	15	34	58	81	89	92	80
sugar	1	10	28	58	77	89	92	79
honey	2	16	43	66	77	86	88	79
kittens	16	27	53	66	77	84	88	79

Word Pairs of Equal Difficulty	Per cent who can correctly spell the word in September in Grades:							Average per cent Grades 5-6-7-8
	2	3	4	5	6	7	8	
wants	13	33	56	66	75	84	91	79
jokes	4	28	46	65	77	83	91	79
sort	10	41	55	69	75	86	87	79
torn	4	29	51	67	77	86	87	79
sew	2	14	42	63	76	85	88	78
warmer	2	22	47	64	76	83	88	78
worry	n/a	13	43	59	79	86	89	78
talked	3	23	54	60	77	87	89	78
porch	2	20	56	65	73	78	94	78
pretty	4	28	39	62	71	81	94	77
riding	8	16	59	69	75	80	85	77
mule	6	13	41	64	77	82	85	77
stocking	n/a	15	39	58	75	85	90	77
spoken	1	7	34	59	75	84	90	77
month	1	24	50	61	78	83	87	77
shut	5	16	50	61	79	83	87	76
moreover	3	27	47	67	75	83	85	76
waiting	n/a	21	43	66	76	83	85	76
rights	3	24	43	59	71	84	88	76
repair	1	7	38	58	71	85	88	76
justly	1	14	36	52	80	83	86	75
reform	3	18	45	51	80	83	86	75
yell	5	26	54	60	73	78	87	75
windy	9	24	41	60	72	78	87	74
tribes	1	12	26	51	72	82	86	73
slope	7	14	34	50	72	82	86	73
prints	1	14	31	50	70	84	89	73
lawns	n/a	12	20	50	71	83	89	73
shake	1	17	37	60	69	80	83	73
painting	4	11	42	59	71	79	83	73
remember`	1	10	23	53	72	80	85	73
hobby	1	11	25	56	68	80	85	72
wear	1	16	41	61	72	76	78	72
says	9	22	40	64	71	74	78	72
tale	3	15	39	63	70	76	80	72
prince	2	8	40	62	71	75	80	72
suits	1	14	36	54	68	80	84	72
standpoint	n/a	10	35	52	71	79	84	72
ideal	1	16	28	54	65	78	91	72
skates	1	17	36	53	65	78	91	72
location	n/a	6	9	37	70	88	92	72
producing	n/a	4	16	37	67	89	92	71
informed	1	15	39	49	69	77	88	71
watched	n/a	5	24	46	70	78	88	71
speaker	n/a	5	27	51	68	81	84	71
single	n/a	10	25	51	69	80	84	71
intend	7	18	43	55	68	78	82	71
queer	1	11	29	55	69	76	82	71

Word Pairs of Equal Difficulty	Per cent who can correctly spell the word in September in Grades:							Average per cent Grades 5-6-7-8
	2	3	4	5	6	7	8	
wouldn't	n/a	6	20	58	67	74	79	70
merry	2	14	39	57	67	75	79	70
victory	n/a	3	15	39	70	84	89	70
serve	1	7	27	38	70	84	89	70
route	1	10	18	47	61	81	89	70
offices	1	11	25	47	64	78	89	70
passage ⁵³	n/a	3	21	45	68	79	88	70
ironing	n/a	13	23	46	66	79	88	70
joined	1	10	26	48	67	78	85	70
mittens	6	20	31	47	66	77	85	69
noble	7	9	32	49	67	77	83	69
shift	4	13	31	52	67	73	83	69
shed	6	19	36	54	66	72	81	69
monster	1	12	35	53	66	73	81	69
roar	n/a	12	28	55	69	73	80	69
paid	1	16	38	56	66	75	80	69
howling	5	16	33	49	60	78	80	67
sweetheart	n/a	6	24	49	60	77	80	67
lists	3	20	34	56	60	74	76	67
Thursday	1	16	36	57	60	72	76	66
thrill	1	11	24	50	59	72	84	66
hundreds	1	14	36	50	59	70	84	66
wages	1	8	30	43	64	76	82	66
repaired	n/a	9	22	42	64	76	82	66
monthly	1	11	29	44	66	74	79	66
rid	11	22	40	43	64	75	79	65
quiet	n/a	7	25	51	67	72	74	66
minute	1	6	13	51	62	73	74	65
rough	n/a	4	21	42	63	72	87	66
sparrow	n/a	3	19	42	60	73	87	65
rare	1	9	23	44	58	72	85	65
shopping	1	8	21	46	55	73	85	65
salesman	1	12	23	43	58	72	84	64
perfume	1	5	18	41	59	71	84	64
requested	n/a	3	16	37	62	72	85	64
notation	n/a	4	15	33	59	78	85	64
hungry	n/a	10	34	50	61	71	74	64
interesting	n/a	12	25	49	62	69	74	64
pennies	6	10	23	44	60	72	78	64
restless	n/a	5	23	40	63	71	78	63
wrist	1	4	20	42	59	71	79	63
troubles	n/a	6	12	40	60	72	79	63
scorn	3	11	25	46	56	71	75	62
racing	2	12	25	45	58	69	75	62
treasure	1	2	14	35	51	79	82	62
rye	n/a	2	15	31	55	79	82	62

⁵³We are using this pair to illustrate how to determine gains on pp. 245.

Word Pairs of Equal Difficulty	Per cent who can correctly spell the word in September in Grades:							Average per cent Grades 5-6-7-8
	2	3	4	5	6	7	8	
seeking	1	9	22	39	63	65	80	62
properly	1	5	18	38	62	67	80	62
prayer	1	7	20	39	54	75	77	61
you've	1	7	22	37	54	75	77	61
mention	n/a	7	14	33	55	76	81	61
locating	2	2	15	34	56	72	81	61
tremble	n/a	3	15	41	55	65	78	60
largely	n/a	5	19	38	56	67	78	60
regular	1	2	11	28	52	74	86	60
regulations	1	6	8	25	53	72	86	59
sections	n/a	1	8	25	56	73	84	60
produced	n/a	2	8	25	57	70	84	59
musical	2	5	11	32	50	68	84	59
statue	n/a	2	11	26	53	70	84	58
ounce	n/a	6	19	33	52	72	79	59
managed	1	8	13	33	53	71	79	59
plunge	n/a	5	19	39	51	63	78	58
refreshments	3	6	21	39	51	62	78	58
quietly	n/a	5	21	34	58	63	75	58
prayers	1	4	15	35	59	61	75	58
verses	1	5	17	35	53	71	74	58
refuge	n/a	7	20	35	55	68	74	58
maintain	1	5	16	38	49	69	74	58
replying	4	5	20	36	53	67	74	58
view	1	2	16	33	55	68	74	58
item	n/a	15	21	33	55	67	74	57
informal	n/a	11	17	26	53	65	83	57
loyal	n/a	7	12	27	52	63	83	57
vision	n/a	1	6	27	50	68	82	57
princess	n/a	3	15	28	48	68	82	57
regard	1	18	27	38	54	63	72	57
you'd	4	15	24	38	53	63	72	57
oblige	1	9	20	38	56	64	69	57
strikes	1	7	21	38	57	62	69	57
industry	n/a	1	7	24	52	66	81	56
preserve	2	8	17	25	51	65	81	56
pearl	n/a	2	18	31	55	66	71	56
pattern	1	3	16	32	55	63	71	55
selection	n/a	1	10	24	53	68	77	56
respects	n/a	3	11	28	51	64	77	55
respective	n/a	4	9	22	45	70	80	54
mission	n/a	3	4	23	45	68	80	54
select	n/a	5	12	34	42	64	75	54
hedge	n/a	3	13	36	42	62	75	54
sole	2	15	33	39	50	58	64	53
lily	2	7	30	41	49	57	64	53
potato	8	14	25	36	50	60	62	52
penmanship	5	11	31	33	54	59	62	52

Word Pairs of Equal Difficulty	Per cent who can correctly spell the word in September in Grades:							Average per cent Grades 5-6-7-8
	2	3	4	5	6	7	8	
voyage	n/a	8	11	26	50	59	73	52
perfectly	n/a	1	10	25	51	58	73	52
represents	n/a	7	18	31	48	54	76	52
obliged	1	6	19	31	45	56	76	52
poetry	1	3	10	24	46	65	72	52
included	n/a	2	13	24	47	64	72	52
reverse	1	2	15	27	46	64	71	52
sprinkle	n/a	3	13	27	47	62	71	52
theme	1	9	17	30	49	56	71	52
salesmen	1	7	18	32	49	54	71	52
instant	n/a	7	15	28	47	65	70	53
neglect	n/a	4	12	27	44	68	70	52
items	n/a	5	22	31	42	59	77	52
inclined	n/a	9	16	33	42	57	77	52
increasing	n/a	1	11	25	46	55	77	51
portion	1	3	8	25	45	55	77	51
intention	n/a	1	9	28	46	63	69	52
regarded	n/a	9	16	27	46	62	69	51
mercy	1	3	17	32	48	57	65	51
sleeve	4	7	17	32	44	59	65	50
introduction	n/a	1	6	19	35	64	79	49
humanity	n/a	2	6	19	37	62	79	49
sister's	5	17	19	43	46	49	54	48
passed	1	9	33	41	44	48	54	47
realize	1	3	9	26	36	56	73	48
width	1	3	10	22	36	58	73	47
mental	n/a	6	11	24	38	60	66	47
represented	n/a	2	13	25	36	60	66	47
naughty	n/a	3	11	27	36	58	67	47
neglected	n/a	4	7	24	36	58	67	46
lawyer	n/a	2	13	22	34	59	67	46
inquiring	n/a	5	7	24	33	58	67	46
surround	n/a	1	10	23	36	58	64	45
reasonable	n/a	3	8	21	36	56	64	44
instantly	n/a	5	11	25	40	54	62	45
image	4	6	10	21	41	52	62	44
imagine	n/a	3	7	13	27	57	69	42
notify	n/a	1	7	11	27	58	69	41
particular	n/a	2	8	14	36	47	68	41
missionary	n/a	1	4	12	34	51	68	41
unusual	n/a	n/a	4	17	28	50	63	40
marriage	n/a	n/a	4	16	27	52	63	40
issues	2	3	6	15	35	49	60	40
horror	1	5	9	15	32	51	60	40
vegetables	n/a	2	8	16	36	44	59	39
supreme	n/a	4	6	13	34	49	59	39
refers	2	6	9	22	31	47	56	39
straighten	n/a	n/a	5	20	32	47	56	39

Word Pairs of Equal Difficulty	Per cent who can correctly spell the word in September in Grades:							Average per cent Grades 5-6-7-8
	2	3	4	5	6	7	8	
mother's	17	24	31	34	37	40	46	39
teacher's	1	11	17	30	36	42	46	39
tailor	6	6	11	24	31	46	50	38
stretch	n/a	3	9	25	32	44	50	38
proceeds	2	3	4	12	30	49	60	38
opposed	n/a	2	3	12	30	49	60	38
nervous	n/a	1	5	13	23	47	64	37
requirement	n/a	n/a	4	12	25	44	64	36
saucers	3	4	7	16	29	44	57	37
security	n/a	1	3	16	24	46	57	36
reference	n/a	n/a	5	11	30	41	58	35
publications	n/a	1	3	13	28	41	58	35
solution	n/a	1	4	13	25	39	62	35
purchased	n/a	2	5	13	23	38	62	34
particulars	1	3	8	17	23	44	53	34
journal	n/a	1	7	20	23	41	53	34
sacred	1	3	8	15	25	38	53	33
nonsense	n/a	2	5	16	20	39	53	32
parcel post	n/a	3	5	16	25	39	52	33
unpleasant	n/a	1	5	13	26	40	52	33
tremendous	n/a	n/a	4	17	23	40	50	33
inhabitant	n/a	1	6	13	25	42	50	33
responsible	n/a	1	2	12	27	39	55	33
merit	n/a	2	8	13	26	38	55	33
readily	n/a	2	5	12	20	37	61	32
superior	n/a	n/a	3	7	21	40	61	32
residence	n/a	1	3	9	24	35	54	31
occasions	n/a	n/a	4	9	20	34	54	29
sacrifice	n/a	1	4	9	15	40	52	29
previously	n/a	1	2	9	15	38	52	29
organization	n/a	1	4	11	20	35	51	29
persuaded	n/a	1	6	11	18	36	51	29
instances	n/a	1	5	10	20	38	47	29
tradition	n/a	1	4	11	24	32	47	29
officials	n/a	1	3	7	16	38	50	28
inferior	1	2	4	7	18	34	50	27
ignorance	n/a	n/a	6	9	16	27	49	25
occasion	1	2	3	7	13	31	49	25
incident	1	2	4	8	15	31	46	25
official	n/a	n/a	n/a	8	16	29	46	25
necessary	n/a	1	2	8	17	23	48	24
legislation	n/a	n/a	2	6	20	21	48	24
sympathy	n/a	n/a	3	5	16	31	45	24
quantities	n/a	1	4	7	13	31	45	24
pursue	n/a	4	6	14	19	26	38	24
veil	n/a	1	6	10	17	31	38	24
illustration	n/a	1	3	8	12	27	44	23
mechanical	n/a	2	3	9	11	24	44	22