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DESIGN FOR SEQUENCING SPELLING-TO-SOUND CORRESPONDENCES FOR
THE SWRL READING PROGRAM

Betty Berdiansky, George Stanton, and Bruce Cronnell

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INTRODUCTION

The Reading Program of SWRL Educational Research and Development
is founded on the use of spelling-to-sound correspondences. Correspon-
dence rules are used to teach the skill of decoding printed words
because spelling-sound patterns of English are generally regular and
specifiable by means of a manageable number of rules (Venezky, 1967,
1970). Since the regularities of English spelling-to-sound patterns
far outnumber the irregularities, a rule-based approach will provide
transferable elements for decoding new words, and the few irregularities
can be learned as sight words. For a detailed discussion of the merits
of such an approach, and the use of spelling-to-sound correspondences
in such a reading program, see Desberg and Berdiansky (1968) and
Berdiansky, Cronnell, and Koehler (1969).

IDENTIFICATION OF THE LEXICON

The first step in the design of this reading program was the
specification of a lexicon appropriate for children at the kindergarten
through third-grade level. Twenty-nine different sources were consulted
in this regard, including the Rinsland (1945) list for elementary school
children, preprimer to fourth-grade reading materials, published word
lists, children's responses to word association tasks, children's TV
programs, and children's verbal behavior in song and in play. Approx-
imately 9,000 words were selected which were believed to be in the
recognition, if not active, vocabulary of K-3 children. This provided
an adequate base for studying the spelling-to-sound correspondences
needed in beginning reading, as well as an ample supply of words for
actual use in the reading program. All words not already categorized
by the Rinsland list were screened by SWRL staff, and categorized as
appropriate to either the K-1 or 2-3 grade levels.

DEVELOPMENT OF SPELLING-TO-SOUND CORRESPONDENCE RULES

After specification of the lexicon, the spelling-to-sound corres-
pondence rules were developed--based primarily on the work of Venezky

(1967, 1970).[1] Venezky's rules were modified somewhat to enable the
reader to proceed directly from spelling to sound. Moreover, the
study of spelling-to-sound correspondences was limited to the 6,000 one-
and two-syllable words in the SWRL lexicon, since these were believed to
be easier and more useful than polysyllabic words for beginning readers.

Although there are only 26 letters in the alphabet, a total of 69
grapheme units were identified for the lexicon. This larger number is
due to the fact that grapheme units were considered to be not only
single consonants and vowels (e.g., m, e) but also sequences of letters
which act as a unit:

    1. double consonants, e.g., mm, tt;

    2. consonant digraphs, i.e., two consonant letters whose pronun-
ciation cannot be determined from the correspondences for the individual
letters, e.g., ch, th;

    3. strings of letters which commonly function together as units,
e.g., ck, le;

    4. secondary vowels, i.e., two or more vowel letters with a
single corresponding pronunciation, e.g., au, ea.

A total of 166 correspondences were established for the one- and
two-syllable words in the lexicon. (A list of all correspondences,
with examples, is found in Appendix D. See Berdiansky et al. (1969)
and Cronnell (1971a), for a complete description of the correspondences
used in this project.) However, for nearly two-thirds (42) of the 69
grapheme units, one correspondence rule was sufficient; for 15 of the
grapheme units, only two rules were needed; for the remainder, 7 required
from three to five rules. It was the primary vowels (a, e, i, o, u, y),
with 11 to 16 correspondence rules each, that appreciably raised the
total number of rules established for the lexicon. This latter result
is not very surprising considering the well-known variability of English
vowel spellings.

The large number of correspondences may imply an unwarranted
degree of complexity. The following four points should clarify this
issue.

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[1]See Berdiansky, Cronnell, and Koehler (1969) for greater detail re-
garding the development of the correspondence rules, as well as the
lexicon specification.

1. Many correspondences are generalizable across several grapheme units (e.g., correspondences for final VCe[2]). This is particularly true for primary vowels where there are 10 such cases; i.e., there are 50 individual letter correspondence rules which can be reduced to 10 general vowel correspondences (referred to as "general primary vowel rules").

2. Correspondences which were general but complex (e.g., $o \rightarrow [o]$ /__C($\{_1^r\}$)V) were broken down into several simpler ones (e.g., Rules 011, 012, 013, 014[3]). This simplification, while reducing complexity, did increase the number of correspondences.

3. Correspondences were established for each double consonant, although, in all instances but two, the pronunciation is the same as for the single consonant.

4. While the environmental conditions differ for each correspondence for a particular grapheme unit, the number of different pronunciations involved is relatively small. After allowing from one to six single-word pronunciation irregularities per grapheme unit, 35 of the grapheme units have just one pronunciation and 17 have just two.

Thus, the larger number of correspondences does not necessarily indicate a proportionately greater amount of learning difficulty.

With the set of correspondences appropriate to the lexicon established, the 6,000 one- and two- syllable words were coded for their component grapheme-unit correspondences. These coded words were then processed by computer and grouped by correspondences, so each word appeared in the list of exemplars of each of its component correspondences. Using the computer-generated data, counts were made of the frequency of individual correspondences. These frequency counts provided information on the usefulness of correspondences and were employed in the sequencing of correspondences.

PRELIMINARY SEQUENCE

In order to use spelling-to-sound correspondences in an instructional program, they must first be sequenced. Therefore, after the compilation of the lexicon and the specification of the spelling-to-sound correspondence rules, the subsequent task in the design of the Reading Program was the formulation of an instructionally efficient and practical rule sequence.

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[2]See Appendix A for a key to pronunciation and symbols.

[3]An explanation of the numbering system devised for the rules of correspondence is given in Berdiansky et al. (1969, p. 15).

Desberg and Cronnell (1969) presented a preliminary sequence based on the following criteria:

1. The spelling-to-sound correspondence rules were to be sequenced primarily according to frequency of occurrence in the SWRL lexicon. High-frequency correspondences are more useful because they provide more word exemplars and greater opportunity for transfer.

2. The sequence of reading instruction was to begin with simple regular rules. Complex rules and rules with pronunciation variations were to be introduced later. More specifically:

    a. correspondences for single letters would precede correspondences for grapheme units of two or more letters;

    b. grapheme units with only one correspondence would precede those with two or more;

    c. correspondences with no environmental constraints would precede those with environmental constraints;

    d. double consonant rules (e.g., MM10) would be sequenced with their corresponding single consonant rules (e.g., M10).

3. Rules were placed earlier in the sequence if they occurred in words which individually had high speech frequencies. Thus, when combined with rules having high, total lexicon frequencies, a small number of rules would be able to generate a large number of frequently used words.

4. The rules were to be sequenced so that, from the beginning of the program, syntax approximating that of normal speech would be possible by using primarily those words containing rules already taught. The number of sight words necessary for this natural syntax was to be minimal.

However, in the Desberg and Cronnell (1969) report, primary vowels, secondary vowels, and consonants were sequenced separately. For a reading program, vowels and consonants must be used together to produce words. Thus a new sequence was necessary, which would combine all types of grapheme units. The work described in the present report resulted in such a sequence, based on the above criteria.

PROGRAM IMPLICATIONS AND ADVANTAGES

A beginning reading program employing such a sequence of rules and words has several major implications and advantages:

1. A well-organized set of spelling-to-sound correspondences

enables the reader to identify many words which are in his oral
vocabulary, but which he has not encountered before in print.

2. The rules, defined on a properly delimited set of lexicon
items, are sequenced in a manner that capitalizes on their applicability
to the vocabulary of the typical reader.

3. Emphasis is placed on the regularity of the English letter-
sound correspondence system and the high degree of pronunciation
predictability. Instruction also specifically, points out those words
containing a correspondence which is not predictable.

4. The most productive and most useful rules are introduced early.
Thus, many words are initially available upon presentation of few rules.

5. Instruction is simplified by focusing on individual correspondence
rules. Extensive practice is made available for each new rule by means
of words containing that rule as their only novel component.

6. Systematic simple-to-complex instruction follows from the
sequence.

7. The large number of words permits construction of equivalent,
but not identical, word usage in practice materials, reading text,
word-attack exercises, and criterion-attainment checks.

8. Grouping words according to common correspondence components
provides numerous examples for instruction focusing on a rule, whether
or not that rule is made explicit to the reader.

The rule sequence described in this report is the product of numerous
and extensive critical analyses and revisions, and forms the basis for
selection of content for the SWRL Reading Program.

Section I

GENERAL SEQUENCING CRITERIA AND METHODOLOGY

GENERAL SEQUENCING CRITERIA

Two general criteria were employed to determine the rule sequence: productivity and complexity. The relatively more productive and less complex rules were sequenced first. Productivity was determined by (1) number of words in the lexicon containing that rule, and (2) usage frequency of the words in the lexicon containing that rule. Complexity was less concisely definable, but principal determiners of relative rule complexity were:

1. **Grapheme-unit pronunciation variability.** The more pronunciations associated with a grapheme unit, the more complex are any of its correspondence rules.

2. **Environment complexity.** The more letter-specific the environment must be to determine the pronunciation, the more complex the rule.

3. **Environment similarity.** A rule is relatively complex if it involves the same environment as another rule specifying a different pronunciation for the same grapheme unit.

4. **Environment generalizability across grapheme units.** If a rule involves the same environment used in a different rule then, sequenced together, the rules are considered less complex than if they each had unique environments.

5. **Phonological generalizability.** Correspondences involving the same pronunciation are sequenced together to reduce complexity.

6. **Similarity of exemplars to those already introduced.** Rules may be sequenced if their exemplars have the same number of syllables or the same stress pattern as words previously introduced.

RATIONALE FOR UNIT, BLOCK, AND YEAR DIVISIONS

To enhance its use for developing an instructional program, the initial rule sequence was divided into groups called "blocks," and then into "units" within blocks.[1] The blocks and units were sequenced, as were the correspondences within them. This division reflected the grouping of rules according to specific similarities so that instruction

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[1]The terms "block" and "unit," as used in this report, do not correspond in way of content to the same terms as used in the Reading Program.

could conveniently focus on limited shared characteristics of the rule exemplars at any point in the sequence. Such a focus was expected to promote the learning of rule generalizations which could be applied to transfer (i.e., previously unencountered) words.

Some of the criteria for grouping correspondences into units and blocks were:

1. type of grapheme unit (e.g., primary vowels vs. secondary vowels);

2. generalizability across correspondences (e.g., the vowel classifications VCe, VCC, Vr);

3. rule frequency;

4. single letters vs. digraphs;

5. phonological similarity or identity (e.g., the [ð] and [θ] correspondences for th; the [oi] correspondence for oi and oy);

6. environmental similarity (e.g., correspondences for a and o before l).

In addition, provisions were made in the sequence for introducing words of two, three, or four syllables at successive points. The general steps involved in sequencing words of more than one syllable were (with two-syllable words as examples):

1. compounds (e.g., bedtime),

2. affixed forms (e.g., bigger),

3. words arranged by stress pattern (e.g., first syllable stressed: rabbit; second syllable stressed: until).

The 27 blocks varied greatly in the number of new rules introduced in each. The number ranged from zero, in blocks concerned with affixes or the review of previously introduced rules for polysyllabic words and higher grade-level words, to a high of 24 rules in Block 1.

The 27 blocks were grouped for convenience into four instructional year divisions.[2] The divisions were based on manageable learning loads for the corresponding K-3 levels, rather than on an equally divided number of blocks or rules per year. (First Year: 4 blocks, 44 rules; Second Year: 10 blocks, 48 rules plus suffixes and VCCe exemplars; Third Year: 8 blocks, 35 rules, plus affixes, 2-3 grade level words, and three-syllable words; Fourth Year: 5 blocks, 57 rules, plus affixes and four-syllable words.) The resulting sequence of rule categories, by year, was:

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[2]A "year" in this report corresponds approximately to two Blocks in the Reading Program.

1. First Year involves short vowels, single consonants, double consonants, and consonant digraphs. All of the exemplars are one-syllable, one-vowel words, classified as appropriate at the K-1 grade level. At least one pronunciation, the most frequent in the SWRL lexicon, is introduced for all letters of the alphabet (except q). The consonant digraphs are common ones contained in high-frequency words. The short-vowel rules are introduced before the long-vowel rules because the short vowels are more frequent, and have simpler environments. The consonant, digraph, and other vowel rules specified for First-Year instruction are generally of high frequency and low complexity.

2. Second Year introduces long vowels, other high-frequency primary vowel rules, secondary vowels, and additional consonant digraphs. Two-syllable words, commencing with compounds and inflectional suffixes, enter the sequence, and instruction covers the vowel stress-pattern variation of these two-syllable words. The primary-vowel rules in Second Year, besides the long-vowel VCe rules, are the correspondences for vowels preceding r, short vowels in two-syllable words, and unstressed vowels having an [ə] or [ɪ] pronunciation. In addition, there are six vowel rules which account for high-frequency words and are exceptions to the regular short- and long-vowel rules. The secondary vowels entering the sequence here are of high frequency.

3. In Third Year, 2-3 grade-level words, as well a K-1 grade-level words, are utilized as exemplars for the rules introduced. The sequence includes the following: three-syllable words; medium-frequency primary and secondary vowel rules; low-frequency consonant rules; silent letters; two- and three-syllable words with affixes; major palatalizations; and stress patterns for three-syllable words.

4. The Fourth Year sequence covers the remainder of the rules of correspondence, i.e., primary and secondary vowel rules of low frequency and low utility. In addition, four-syllable words are introduced, including those with affixes and those with new stress patterns.

A summary of the complete rule sequence is found in Appendix C.

COMPUTER PROCESSING OF SEQUENCE, RULES, AND EXEMPLARS

After establishing a sequence for the rules of correspondence, a computer program was written applying the sequence to the entire lexicon of one- and two-syllable words. This program was designed to search the lexicon and to list for each rule the words containing that rule in combination with rules previously introduced. Each word appeared as an exemplar of only one correspondence, all other correspondences in the word having already been introduced. In addition to the main purpose of listing sequenced rule exemplars, the computer program also provided a count of the number of words listed upon the introduction of each rule, the number of words listed for each unit

of rules, and the number of words listed for each block of rules.
The word lists and frequency counts are given in Section IV. The program was run separately for the portion of the lexicon designated as K-1 grade-level words and again for the 2-3 grade-level words.

In addition to the computer-processed sequence, the uncoded words of three or more syllables were arranged in the sequence by hand. Upon the addition of these words, several more correspondences were established to account for additional spelling-to-sound relations found in the larger lexicon; this brought the total number of sequenced correspondences from 166 to 186.

Also, a parallel study (Cronnell, 1971b) was made of spelling-to-sound correspondences in nearly 500 common proper names (primarily first names, but with some high-frequency surnames). These names (both regular and exceptions) were arranged according to the sequence and principles described above. Section VI lists these sequenced proper names.

WITHIN-RULE SEQUENCING CRITERIA

Examination of the computer listing of exemplars for each rule in the sequence revealed that certain words were simpler and clearer examples of the rule than were other words in the same list. Consequently, the exemplars of each rule were subgrouped, primarily according to the location of the exemplified grapheme unit in those exemplars. Then an instructional word-group order was established, based on predicted efficiency and clarity of rule exemplification in each word group. The general criteria used for this order were:

1. Position of grapheme unit;

2. Number of syllables;

3. Frequency;

4. Complexity of other correspondences in the examples.

When there was no criterion for division, or when the number of exemplars was low, words were alphabetized. Within each subgroup, words were also alphabetized. Section IV lists the exemplars for each rule, subgrouped according to the within-rule sequencing criteria described above. More specific criteria also utilized are described in Section III.

IRREGULAR WORDS

Approximately 10% of the one- and two-syllable words in the SWRL lexicon are labeled "irregular." These words contain at least one

correspondence which is not accounted for by any of the rules in the program. Such exceptions were grouped and listed separately from the regular words, but according to the same sequence described above for the regularly spelled words. For the purpose of computer sequence processing, the irregularity within each exception word was designated as equivalent to the grapheme unit's earliest appearing regular counterpart. In addition, each word was not introduced until all the regular correspondences within it had appeared in the sequence. Thus, the irregular words were computer sequenced according to their earliest possible occurrence. In general, it was planned that irregular words would enter the exemplar sequence with the rules to which they were similar, or to which they were specific exceptions, provided that all of their regular rule components had already been introduced. To accomplish this, some of the irregular words had to be "hand-moved" in the sequence. The sequence of irregularly spelled words is found in Section V.

It is recognized that many exceptions are high-frequency function words, useful and necessary for reading text syntax, which for naturalness in reading materials must be used earlier than now placed in the sequence. In fact, a reading program could well begin with 15-20 high-frequency and high-utility sight words (primarily irregular), rather than commencing immediately with rule-based words, in order to more closely approximate spoken language in the reading texts. Most irregular words contain only one irregular correspondence. (While 10% of the coded one- and two-syllable words in the lexicon are irregular, their irregular components account for only 3% of the total number of grapheme units found in the lexicon.) This being the case, after rules are introduced, reinforcement can still be given the reader for decoding the major part of an irregular word, thus again emphasizing the high degree of regularity in English spelling-to-sound correspondences.

Some exceptions can be handled by additional correspondences when a larger lexicon is used. Moreover, even when there are exceptions to established correspondences (primarily due to environmental constraints), new or unusual pronunciations for a grapheme unit are rarely involved. In addition, only 55 different base words plus their derived forms (e.g., to, plus into, onto, and unto) account for 21% of the exception words. If beginning readers can learn a group of basic sight words and can have a set for diversity, they should be able to decode most words containing exceptions.

Consideration should also be given to the place of contractions, abbreviations, and bound morphemes in a reading program. Without these, sentences often tend to be awkward and unnatural. The use of common contractions might help prevent beginning readers from reading in a stilted, word-by-word fashion, since such contractions would make the texts more like spoken language. High-frequency abbreviations such as Mr. and Mrs., and others such as Dr., St., Ave., a.m. and p.m. might also be considered for inclusion commencing at least in the second year

of instruction. In Section VIII, contractions and abbreviations are arranged according to the sequence described in this report.

Tenses may change unnaturally within beginning stories if constraints are placed on them by the absence of inflectional suffixes, such as -s, -es, -ing, and -ed. There may be a lack of consistency both within the narration itself and between the narration, dialogue, and illustrations. Investigations should be made to determine whether the additional learning loads involved with contractions and such suffixes as -s, -ing, and -ed are great enough in the first year of instruction to warrant sacrificing natural speech and possibly even hindering comprehension and reading fluency.

GRAPHEME-UNIT PRONUNCIATION VARIABILITY

As discussed above, the SWRL Reading Program incorporates two types of spelling-to-sound rules of correspondence: "regular" rules with predictable pronunciations usually occurring in specifiable environments; and "irregular" rules with correspondences considered too unproductive to be classified as regular rules, or with exceptions to regular rules. An irregular correspondence of this latter type is one with a pronunciation not already covered by a regular rule, or one with a regular pronunciation occurring in an environment different from that specified by the regular rule.

Most consonant and secondary vowel grapheme units have only one or two regular pronunciations. And for all consonants except s and th, and for all secondary vowels except ie, there is only one regular rule per pronunciation. Primary vowels, however, each have an average of six pronunciations covered by 13 rules. Consonants and secondary vowels have an average of one or two irregular pronunciations. These irregular correspondences involve pronunciations other than those covered by regular rules, except in a minority of cases where one and occasionally two of the pronunciations are the same as regular rules but occur in different environments. Primary vowels, on the other hand, have an average of seven irregular pronunciations, one-half of which are the same as those accounted for by regular rules; they are irregular in that they occur in different environments.

Confronted with the large number of correspondence rules (186, although many of the vowel rules could be combined and then generalized across the primary vowels), and faced with the environmental details specified by the rules, the learner might lose sight of the degree to which the most important information to be gained about each grapheme unit--its pronunciation(s)--can be condensed from rule information. Another aspect of this pronunciation overview that the learner might not deduce is that the pronunciation variability is much lower for both consonants and secondary vowels than for primary vowels, and that he will, therefore, have to concentrate more on environment specifications

of the primary vowel rules for indications of correct pronunciation than he will for other rules.

· A study of the correspondences used in this report indicates that almost three-quarters of the 69 grapheme units have a major pronunciation which accounts for over 80% of their exemplars. In fact, 60% of the grapheme units have one pronunciation which accounts for 90-100% of their exemplars. Nineteen of the grapheme units are invariant: they have no lexicon exceptions to their major pronunciation. Most of these are double consonants or digraphs. Only one, aw, is not a consonant. Of the 24 grapheme units that have one pronunciation which accounts for 90-99.9% of their exemplars, most have a single pronunciation with just a few exceptions or a major pronunciation with a secondary minor pronunciation. A few have three or more pronunciations, but the major pronunciation accounts for the vast majority of exemplars. The latter is also true of grapheme units whose major pronunciation accounts for 80-89% of their exemplars.

The only consonants whose major pronunciation accounts for less than 80% of their exemplars are c, cc, g, and th. And the two pronunciations of th should cause students little trouble because they are so similar phonetically ([θ] as in thumb, and [ð] as in this). One-half of the secondary vowels rank over 80%. Only one primary vowel does: the major vowel pronunciation, [I], of y accounts for 85% of its exemplars (y is invariant as a consonant). The vowels are the least reliable: y = 85%, u = 73%, i = 65%, a and e = 42% each, and o = 28%. For o, even if the pronunciation regarding the dialect variation of [o], [a], or [ɔ] (e.g., as in horn) was added to the major pronunciation of [o], it would still only rank 41%.

This study of grapheme unit variability indicated that double consonants are invariant or very nearly so, with the only exception being ss, which has one major pronunciation and two minor ones. Single consonants tend to have a major pronunciation with a few irregular exemplars, or to have a major pronunciation and a secondary pronunciation. The only consonants which do not clearly fit into this description are c, g, s, and t. Consonant digraphs have one or sometimes two pronunciations, with the exception of ch. Secondary vowels have one or two pronunciations, except for ea and ou which each have more than three common pronunciations. Primary vowels are highly variant, with an average of seven pronunciations.

In all, one-half of the 69 grapheme units used in the rules have just one pronunciation, with the allowance of 1-5 exception words; one-quarter have just two pronunciations, with the allowance of 1-5 exception words; and only the remaining one-quarter have three or more pronunciations. Also, as stated above, nearly three-quarters of the grapheme units have a major pronunciation which accounts for over 80% of their exemplars.

Section II

DETAILED DESCRIPTION OF THE SEQUENCE

This section presents a complete description of the sequence. (For a summary of the sequence, see Appendix C.) Spelling-to-sound correspondences are arranged in blocks according to the sequencing criteria already described. The set of 27 blocks is divided into four years; each block is divided into units which contain specific rules. Thus this section is arranged, in order, by year, block, unit, and rule. For each such level, the frequency of exemplars is indicated; for each level below the year level, detailed description of the content is presented.

First Year: Frequency = 797

(One-syllable words; Single consonants; Double consonants; Consonant digraphs; Short vowels)

Block 1: Frequency = 315 (Highest frequency single consonants; Double consonants; General primary vowel Rule 15: short vowels)

Unit 1: N10, NN10, T10, (TT10),[1] A15, I15   Frequency = 10

Unit 2: P10, (PP10)   Frequency = 11

Unit 3: L10 (7),[2] LL10 (3), S10 (27), SS10 (3)   Frequency = 40

Unit 4: D10 (14), DD10 (1), E15 (32)   Frequency = 47

Unit 5: M10 (32), (MM10), B10 (28), (BB10), U15 (41)   Frequency = 101

Unit 6: R10 (45), (RR10), H10 (22), O15 (39)   Frequency = 106

Preparatory to specifying the contents of Block 1, the relative frequency of occurrence within the entire lexicon was determined for each single-letter consonant rule. The nine identified as being the most frequent (r, t, n, l, s, d, p, m, b) were then combined with the short-vowel rules. Instruction on short-vowel rules precedes instruc-

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[1]Block 1 double consonant rules in parentheses have no exemplars at the point where they are listed in the sequence. The first appearance of parenthesized rules is indicated in the text.

[2]Numbers in parentheses are frequencies of individual rules.

tion on long-vowel rules because the short-vowel rules are more productive and less environmentally complex than the long-vowel rules. The central concern was that the sequence should begin with the most productive combination of rules.

The rule-content of 1,1[3] was established by comparing the number of two-, three-, and four-letter lexicon words produced by all possible sequences of short-vowel and selected consonant rules. The optimal initial combination proved to be n, t, a, and i, and so the rules covering these letters formed Unit 1. A similar procedure was used in determining the sequence for the remaining units in Block 1. Each position in the sequence was filled by that rule which, in combination with all previously taught rules, would produce the most exemplars. The rule ordering which resulted from this determination of sequence-position productivity was divided into units of instruction with consideration given to the number of exemplars and instruction increments from unit to unit.

Double consonants are sequenced in the same unit as the corresponding single consonants (e.g., N10 and NN10 both appear in Unit 1) because, in most instances, double consonants have the same pronunciation as their corresponding single consonant's highest frequency rule, which is the rule introduced in Block 1. The learner should treat double consonants as if they were single. There are very few exceptions to this "rule," and they are not sequenced until later. Double consonants which have no exemplars at their time of introduction are reintroduced as their exemplars enter the sequence. Double consonants do not occur in word-initial position. They are primarily found in medial position and thus are more common beginning in Block 9, where two-syllable words are introduced. The only ones in final position which have more than three SWRL lexicon exemplars are ff, ll, ss, and zz. There are no doubled forms for h, j, k, q, w, x, and v.

A possible view of double consonants—one used by Venezky (1970)—is to treat them as a sequence of individual consonants, both of which correspond to single sounds, but by a general rule of English phonology the two sounds are leveled and produced as one, e.g., mm → //mm//[4] → [m]. While theoretically sound, this view was considered too complex for instructional purposes.

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[3]In this notation, the first number signifies the block, and the second the unit.

[4]The double slashes (//...//) are used to enclose non-occurring forms, posited between spelling and pronunciation (Venezky's morphophonemic level).

Following are more specific notes on the content of Block 1.
Throughout this discussion of the sequence, general notes about each
block and unit will be followed by notes on specific rules contained
therein.

1,1: N10: $\underline{n}$ → [n̄], e.g., $\underline{an}$

NN10: $\underline{nn}$ → [n], e.g., $\underline{inn}$

T10: $\underline{t}$ → [t], e.g., $\underline{at}$

(TT10: $\underline{tt}$ → [t], e,g., $\underline{mitt}$)

A15: $\underline{a}$ → [æ] /__C(C)#, e.g., $\underline{at}$, $\underline{ant}$

I15: $\underline{i}$ → [ɪ] /__C(C)#, e.g., $\underline{it}$

Unit 1 is composed of the rules N10, T10 (plus their double
consonant rules), A15, and I15, these being the rules which together
produced the most, albeit a small number of, exemplars.

NN10: The double consonant $\underline{nn}$ has the invariant pronunciation
[n] as in NN10. The only words in modern English with final $\underline{nn}$ are
$\underline{inn}$ and proper names.

TT10: The grapheme unit $\underline{tt}$ has the invariant pronunciation
[t] as in TT10. Final $\underline{tt}$ occurs in only two lexicon words ($\underline{butt}$,
$\underline{mitt}$) and proper names. Although TT10 is sequenced here in 1,1 for
reasons discussed above, the first occurrence of TT10 exemplars
is in 1,5.

A15: In certain dialects, some words may use [a], e.g.,
Eastern and British $\underline{glass}$, $\underline{dance}$.

1,2: P10: $\underline{p}$ → [p], e.g., $\underline{pin}$

(PP10: $\underline{pp}$ → [p], e.g., $\underline{pepper}$)

Unit 2 was limited to one rule (P10) to compensate for the
relatively large instructional load necessary in 1,1.

PP10: The grapheme unit $\underline{pp}$ has the invariant pronunciation
[p] as in PP10. There are no occurrences of final $\underline{pp}$, except in
proper names. The first occurrence of PP10 exemplars is in 9,2.

1,3: L10: $\underline{1}$ → [ɪ], e.g., $\underline{lip}$

LL10: $\underline{11}$ → [ɪ], e.g., $\underline{pill}$

S10: s → [s], e.g., sat

SS10: ss → [s], e.g., pass

L10: The letter l has only two pronunciations: [l] as in
L10, and [∅] as in L20 and in some irregular forms, except for
in the word colonel.

LL10: The grapheme unit ll has the invariant pronunciation
[l] as in LL10, except in borrowed Spanish words, e.g., tortilla.
It is the most frequent double consonant in the lexicon.

S10: The letter s has two major pronunciations: [s] (Rules
S10 and S21) and [z] (Rule S20). In addition, palatalization
(see 21,3) may result in the pronunciations [š] and [ž]; in a few
words s is silent, e.g., island.

Following the introduction of S10, both s → [s] and s → [z] plurals
and third-person singular, present tense forms of exemplars are
allowed in order to facilitate the approximation of natural
speech in beginning reading. The correct pronunciation of the suffix
is automatic in speech (e.g., kit[s] vs. kid[z] vs. kiss[ɪz]). If
the appropriate response to the printed s does not occur automatically,
instruction may explicitly acknowledge the alternative [s] and [z]
pronunciations of the suffix -s and the exemplars could be separated
for instruction on [s] and [z] pronunciations. The [ɪz] pronunciation
is sequenced in 5,3 because of the additional, unstressed vowel. The
[z] pronunciation of the inflectional ending -s is the first
instance of an alternative to a grapheme unit's most frequent
pronunciation, and the first step in preparing the learner to make
varying pronunciation responses to a single letter. For all other
rules in Block 1, only one pronunciation per letter is taught.
Rule environments are not made explicit at this point, since alternative
pronunciations depending on contrasting rule environments have not yet
been presented.

SS10: After ll, ss is the second most frequent double consonant
in the present lexicon. A large number of its occurrences are in the
suffixes -less and -ness, introduced on 10,1.

1,4: D10: d → [d], e.g., did

DD10: dd → [d], e.g., add

E15: e → [ɛ] /__ C(C)#, e.g., set, lend

D10: Verb past tenses are presently introduced in 5,4 because
of the variations in the pronunciation of the e as well as the d in the
-ed suffix (e.g., kill[d] vs. kiss[t] vs. kid[ɪd]). However, it is

possible for the suffix -ed to be in Block 1, as is -s, in order to better approximate natural speech in writing. Earlier introduction is also possible for the verb suffix -ing, and also to a lesser degree for the suffixes -er, -y, and -ly (all of which are presently sequenced in Second Year).

DD10: The grapheme unit dd has the invariant pronunciation [d] as in DD10. The only words, besides proper names, in modern English with final dd are add and odd.

1,5: M10: m → [m], e.g., man

    (MM10: mm → [m], e.g., mammal)

    B10: b → [b], e.g., but

    (BB10: bb → [b], e.g., bubble)

    U15: u → [ə] /__C(C)#, e.g., up, bump

M10: The letter m has the invariant pronunciation [m] as in M10 for all words in the SWRL lexicon. Double consonant Rule TT10 is first exemplified here.

B10: The letter b has only two pronunciations: [b] as in B10 and [∅] as in B20 (introduced in 19,4).

MM10 & BB10: The double consonants mm and bb have the invariant pronunciations [m] as in MM10 and [b] as in BB10, respectively. The first occurrence of their exemplars is in 9,2. There are no occurrences of final mm, except in proper names. And other than proper names, the only word in modern English with final bb is ebb.

U15: In Berdiansky et al. (1969), u in the environment /__r was coded U15 or U16. Because of the effects of [r] on the pronunciation of vowels, such words have been recoded U21 and placed in Block 9 with other Vr exemplars.

1,6: R10: r → [r], e.g., run, (far)

    (RR10: rr → [r], e.g., hurry)

    H10: h → [h], e.g., had

    O15: o → [a], e.g., hot, odd

R10: The letter r has the invariant pronunciation [r] as in R10. Postvocalic r is not included in this unit because of its affects on the preceding vowel. Vr correspondences are introduced in Block 9.

RR10: The double consonant **rr** has the invariant pronunciation [r] as in RR10. It occurs finally in only two lexicon words (**burr**, **purr**) and proper names. The first occurrence of RR10 exemplars is in 9,1.

H10: The letter **h** has only two pronunciations: [h] as in H10, and [∅] as in H20. There is no doubled form **hh**. On the basis of frequency, H10 would have been placed in a later block, but it was sequenced here, due to the decision that the component letters (e.g., **s**, **t**, **h**) of a digraph (e.g., **sh**, **th** in Block 2) should be introduced before the digraphs themselves.

Block 2: Frequency = 51 (Consonant digraphs)

    Unit 1: SH10   Frequency = 29

    Unit 2: TH13 (6), TH11 (16)   Frequency = 22

Consonant digraphs are treated as grapheme units because their pronunciation is not a combination of common pronunciations of their component letters. They are introduced in Block 2, prior to the remaining single consonants, because of the high-frequency function word exemplars of Rule TH13 and the need for these function words in the story-construction aspect of reading instruction.

A third high-frequency digraph, NG10, could be added to Block 2. NG10 has a high rule frequency and its exemplars have high individual frequencies. If -**ing** verb suffixes are allowed in Block 1, as suggested (1,4), then the beginning reader should have no problem reading base words which include the phonogram **ing** (e.g., **sing**, **thing**). And one-syllable NG10 base words having other preceding vowels (e.g., **rang**, **rung**) should then present little, if any, more difficulty.

2,1: SH10: **sh** → [š], e.g., **shut**

SH10 is the first rule taught in Block 2 because it is the highest frequency digraph and so was considered to be an appropriate choice for introducing digraphs. SH10 also has more exemplars with Block 1 grapheme units than the remaining single consonants, sequenced in Block 4, do. The grapheme unit **sh** has the invariant pronunciation [š] as in SH10.

2,2: TH13: **th** → [ð] in pronouns, conjunctions, and other function words, e.g., **them**, **then**, **this**

    TH11: **th** → [θ], e.g., **thin**

In Unit 2, TH11 is introduced at the same time as TH13, which has function word exemplars, because of the near identity of the two th correspondences, [ð] and [θ], which differ only in voicing. Also, with three lexicon execeptions (clothes, eighth, and isthmus), the grapheme th has only two pronunciations; [θ] as in TH11, and [ð] as in TH12 and TH13. TH12 is not introduced at this point because it occurs in words with long vowels and/or two syllables. TH12 also has a specifiable environment and so will be sequenced after instruction employs rules which require attention to surrounding letters. The TH11 [θ] pronunciation could be contrasted with the TH13 [ð] pronunciation although most speakers probably do not realize that two pronunciations exist for the grapheme unit th. Whether or not the alternate pronunciations of TH11 and TH13 should be specified is a question which should be studied empirically. At present, it appears that instruction may acknowledge the existence of two pronunciations for th, and children may simply be reminded of the alternate pronunciation if an error is made. Once learners read fluently enough to be affected by syntactical constraints, there should be few errors made between the [ð] of th function words and the [θ] of th content words.

Block 3:   Frequency = 51 (EE10; Long vowel at end of word)

Unit 1:   EE10 (36), E25 (4)   Frequency = 40

Unit 2:   Y19   Frequency = 11

The rules EE10 and E25 are positioned here in the sequence because their exemplars have high individual frequencies (i.e., they are common words). Rule Y19 is included because, like E25, it has a long vowel pronunciation in a /#(C)C__# environment (or in a stressed syllable). Rule O25 would have been included here for the same reason except it has too few exemplars and it also has exceptions which themselves have high individual frequencies.

3,1:   EE10:   ee → [i], e.g., beet

E25:   e → [i] /#(C)C__#, e.g., we, she

Two spellings with the same pronunciation expose the reader to and prepare him for alternate pronunciations of vowels, which will be elaborated upon in later blocks. This block also adds to the concept of letters representing more than one pronunciation (E25 as opposed to E15).

EE10:   The grapheme unit ee has an invariant pronunciation [i] as in EE10, except in the words been, breeches, and creek (in some dialects), and in borrowed French words, such as matinee. The long-

vowel pronunciation following from the double-vowel stimulus is specific to ee. While EE10 is not the most frequent secondary-vowel correspondence (EA10 is), it is sequenced first because the grapheme unit has one common pronunciation. Other secondary-vowel rules--less frequent and/or more variable--are introduced in Second, Third, and Fourth Years.

E25: Rule E25 occurs in a /#(C)C__# (one syllable) environment. An E25 exemplar has no other vowel, whereas an E18 exemplar (introduced in Block 6) has another vowel: VCe#. The letter e in a /#(C)C__# environment has the invariant pronunciation [i], except in the words re and the.

Long e in word-final position introduces some high-frequency words (e.g., he, she) as rule exemplars instead of as sight words. Also, attention is now focused on what will later be crucial word aspects, since this is the first instance of a pronunciation of a grapheme unit depending on an explicit statement of environment (in this case, the end of a word).

3,2: Y19: y → [ay] /__# in stressed syllables, e.g., try

In Unit 2, Rule Y19 occurs in word-final position in one-syllable words (e.g., /__#). Y19 exemplars in stressed syllables in two-syllable words are introduced in Second Year. (Final y in unstressed syllables is covered by Rule Y17; see 10,2).

Block 4: Frequency = 380 (Less frequent consonants)

    Unit 1: F10 (51), FF10 (9), W10 (31)   Frequency = 91

    Unit 2: K10 (37), N20 (34), C12 (59), CK10 (57) Frequency = 187

    Unit 3: G12   Frequency = 65

    Unit 4: J10 (12), X10 (14), Y10 (6)   Frequency = 32

    Unit 5: V10 (2), Z10 (2), ZZ10 (1)   Frequency = 5

Block 4, the final block of First Year, includes the remaining single consonants (i.e., those not taught in Block 1), as well as the digraph ck. Also, the [ŋ] pronunciation of n (Rule N20) is allowed following the introduction of k.

    4,1: F10: f → [f], e.g., fat

        FF10: ff → [f], e.g., stiff

        W10: w → [w], e.g., wet

The rank-order of the five most frequent consonants in Block 4 is: K10, G12, C12, F10, and W10. F10 and W10 have lower frequencies than do K10, G12, and C12; however, _f_ and _w_ do not have environment-dependent correspondences as do _c_ and _g_. Therefore, it was decided that F10 and W10 would be less difficult correspondences to learn and so would be more appropriate for Unit 1 than the other rules.

F10: The letter _f_ has the invariant pronunciation [f] as in F10, except in the word _of_.

FF10: The double consonant _ff_ has the invariant pronunciation [f] as in FF10.

W10: The letter _w_ has only two pronunciations: [w] as in W10, and [Ø] as in W20. There is no doubled form _ww_.

4,2: K10: $\underline{k} \rightarrow$ [k], e.g., _milk_

N20: $\underline{n} \rightarrow$ [ŋ] /___ $\left\{\begin{array}{l} k \\ x \\ qu \\ g \text{ pronounced [g]} \\ c \text{ pronounced [k]} \end{array}\right\}$ e.g., $\begin{array}{l} \text{thank} \\ \underline{\text{(anxious)}}^{5} \\ \underline{\text{(banquet)}} \\ \underline{\text{(single)}} \\ \underline{\text{(Lincoln)}} \end{array}$

C12: _c_ [k] /___ $\left\{\begin{array}{l} a \\ o \\ u \\ C \\ \# \end{array}\right\}$ e.g., $\begin{array}{l} \underline{\text{cat}} \\ \underline{\text{cot}} \\ \underline{\text{cut}} \\ \underline{\text{crash}} \\ \underline{\text{(picnic)}} \end{array}$

CK10: $\underline{ck} \rightarrow$ [k], e.g., _kick_

The rules K10, C12, and CK10 are combined for Unit 2 because they share a common pronunciation, [k]; Rule N20 is included because it commonly occurs with K10.

K10: The letter _k_ has only two pronunciations: [k] as in K10, and [Ø] as in K20.

N20: Regarding Rule N20, it is optional to acknowledge the automatic sound change of _n_ → [ŋ] /___ [k]. Since Rule N20 was used in coding, this is where it first can have exemplars, due to Rule K10. Even if Rule N20 is not specifically taught, the exemplars would enter here. The pronunciation should be relatively automatic and probably does not need to be explicitly taught. The first occurrence of Rule

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[5] Words in parentheses are exemplars of environments not introduced until later in the sequence, at which point they are noted.

N20 in other less frequent environments is as follows: /__g pronounced [g], 10,2; /__c pronounced [k], 4,5; /__x, 23,3; /__qu, 11,4.

C12: The most frequent and least complex correspondences for the letters c and g are introduced in Block 4--the [k] sound of c and the [g] sound of g, as exemplified in the words cat and gas. The alternative [s] sound of c and [ǰ] sound of g (e.g., ice, age) have a more complex environment and their occurrence is often associated with the long-vowel rule. Consequently, these two rules (C11 and G11) have been sequenced following the introduction of the long-vowel rules (7,1). The doubled forms gg and cc are sequenced in Second and Third Years rather than in this block, because their pronunciations ([g] and [gǰ], [k] and [ks]) are determined by the following letter. The only lexicon exception to C12 (i.e., to c → [k] for that environment) is the word muscle.

CK10: The grapheme unit ck has the invariant pronunciation [k] as in CK10. This digraph could be considered t₋ be the combination of the two letters: c and k, but since ck always corresponds to one sound, it seems simplest for instructional purposes to treat it as a unit.

$$4,3: \quad G12: \quad g \rightarrow [g] \ /\_\_ \begin{Bmatrix} a \\ o \\ u \\ C \\ \# \end{Bmatrix} \quad e.g., \quad \begin{matrix} \underline{gas} \\ \underline{got} \\ \underline{gum} \\ \underline{grin} \\ \underline{bag} \end{matrix}$$

Rule G12 is sequenced in Unit 3, immediately following C12, because they have the same environmental constraints on pronunciation. G12 has the same environment as C12, and contrasts with G11 just as C12 does with C11.

The only exceptions to G12 (i.e., to g → [g] for that environment) are the word judgment and the letter combination gn (Rule G20; 19,3) in which g → [∅]. Final g occurs only in a small number of words, mostly monosyllables.

Rule G31 (g → [g] /__$\begin{Bmatrix} e \\ i \\ y \end{Bmatrix}$) is an exception to Rule G11 (g → [ǰ] /__$\begin{Bmatrix} e \\ i \\ y \end{Bmatrix}$), but it has the same [g] pronunciation as G12. G21 is presently sequenced in 11,6, but it could be resequenced here with G12, although its only exemplars at this point would be get, gift, gig, and gill.

4,4: J10: j → [ǰ], e.g., jet

X10: x → [ks], e.g., box

Y10: y → [y], e.g., yet

The consonants in Units 4 and 5 have very low frequencies. They are nevertheless included at the end of First Year so that, in order to encourage increased independence in dealing with words encountered outside of the Program, beginning readers will have learned at least one (and the major) pronunciation of each letter in the alphabet, with the exception of q, which is represented only in the digraph qu. However, QU10 might be included for the same reason V10 and Z10 are--to provide one pronunciation for each letter.

J10: The letter j has the invariant pronunciation [j] as in J10, except in borrowed Spanish words, such as frijoles. The letter j generally occurs initially, sometimes medially, and never finally; nor can it occur doubled. The grapheme unit dg is used instead of doubled j, and dge or ge is used instead of final j (see G11, 7,1 and VCCe, 14,1).

X10: The letter x has only two pronunciations: [ks] as in X10 and [gz], except for the [z] pronunciation in initial position, as in such nonlexicon words as xylophone. The letter x in final position is always pronounced [ks] as in X10. There is no doubled form xx. The pronunciation [gz] was considered irregular in this study because of the few exemplars (see end of Section V); it occurs when the preceding vowel is unstressed and the following vowel is stressed, e.g., exam.

Y10: As a consonant, the letter y has the invariant pronunciation [y] as in Y10. It is relatively infrequent in modern English, occurring primarily in initial position, and in medial position in a few words such as beyond, canyon, and lawyer. The letter y occurs nine times more often as a vowel than as a consonant. There is no doubled form.

4,5: V10: v → [v], e.g., vest

Z10: z → [z], e.g., zig-zag

ZZ10: zz → [z], e.g., buzz

V10, Z10, and ZZ10 are sequenced last in First Year due to their very low frequency. Since there are only five lexicon exemplars of these three rules at this point in the sequence, others could be introduced orally, and instruction on the correspondence repeated, if necessary, when other exemplars enter the sequence in Second Year. Alternatively, the rules might be postponed until they have more exemplars: V10 and Z10 in 6,1 and ZZ10 in 10,2.

V10: The letter v has the invariant pronunciation [v] as in V10. When [v] is final in a word, v is always followed by e (e.g., have, sleeve), except in names and the slang term rev. Double v is rare in English, and there are no lexicon exemplars.

Z10: The letter z has the invariant pronunciation [z] as in Z10, except in waltz, and in palatalized forms such as glazier and azure (see Section VII). The letter z is the least frequently used letter in modern English.

ZZ10: The grapheme unit zz has the invariant pronunciation [z] as in ZZ10, except in the word pizza. The doubled form zz occurs finally only in a few words.

Second Year: Frequency = 2313

(Two-syllable words; Long-vowels; Vowel-r; Other high-frequency vowel rules; High-frequency consonant digraphs; Unstressed vowels; High-frequency secondary vowels)

<u>Block 5</u>: Frequency = 68 (plus base words with suffixes) (Compounds; Suffixes; NG10)

Unit 1: Compounds using First Year rules   Frequency = 36
(first syllable stressed)

Unit 2: The -<u>ing</u> suffix with previously introduced base words.

Unit 3: The -<u>es</u> suffix (plurals and third-person singular, present tense forms) with previously introduced base words.

Unit 4: The -<u>ed</u> suffix (past tense) with previously introduced base words.

Unit 5: NG10   Frequency = 32

Block 5 introduces two-syllable words, beginning with the least complex, compounds and inflectional suffixes. The exemplars in Units 1-4 involve First Year rules. They thus serve as a review of rules already covered, in addition to introducing the concept of syllables. The digraph <u>ng</u> is also introduced in one-syllable exemplars since the pronunciation is the same as in the -<u>ing</u> suffixes of Unit 2.

It is possible that any or all of Block 5 content could be introduced earlier. A particular case can be made for the early use of the -<u>ing</u> and -<u>ed</u> suffixes, to provide more natural, reading material since the progressive and past tenses are common in narrative.

5,1: Compounds using First Year rules (first syllable stressed), e.g., <u>bathtub</u>

In Unit 1, lexicon compounds using First Year rules are introduced, but nonlexicon compounds of other previously taught base words are also allowed. For example, the word <u>standstill</u> is not in the lexicon, but could be introduced here because its components <u>stand</u> and <u>still</u> have already entered the sequence. All words in this unit receive primary stress on the first syllable; compounds with primary stress on the second syllable are introduced in 10,3.

5,2: -<u>ing</u> suffix with previously introduced base words, e.g., <u>running</u>

In Unit 2, which introduces the -ing suffixes of base words, exemplars are not listed, but could be separated for instruction between those which double the final consonant of the base word before adding the -ing suffix (CVC base words where the final consonant is not an x) and those which do not. The -ing noun and adjective forms of base words, which are less frequent than the verb form, could be introduced either here or where now sequenced in 11,1 with two-syllable NG10 exemplars.

5,3: -es suffix (plurals and third-person singular, present tense forms) of previously introduced base words, e.g., boxes

Unit 3 introduces -es [ĭz] plurals and third-person singulars of base words. Exemplars are not listed, but involve base words ending in sh, s, ss, and zz. The -es endings of ch and tch base words should be introduced in 11,2 where CH10 and TCH10 are sequenced for instruction. If confusion arises for the readers concerning the unstressed [iz] pronunciation of the -es suffix, this unit could be postponed until after the unstressed E17 rule has been introduced in 10,1. The -s [s] and [z] endings of all previously taught base words have been allowed as soon after 1,3 as the base words them- selves were introduced, with the exception of the -ies endings of Y19 base words; these will be introduced in 10,2 with Y17 exemplars, which also involve suffixed forms in which the y changes to i when es is added.

5,4: -ed suffix (past tense) of previously introduced base words, e.g., stopped

Unit 4 introduces the -ed past tense of base words; such forms are also used as past participles and as adjectives. In speech, the correct pronunciation, [d], [t], or [ɪd], is automatic but exemplars could be separated on this basis if desired. If confusion arises for the readers concerning the unstressed [ɪd] pronunciations of the -ed suffix, these exemplars could be postponed until after E17 has been introduced in 10,1. The -ied endings of Y19 base words will be introduced in 10,2 with the -ied endings of Y17 base words. It would be optional to point out the silent e pronunciation in the -ed [d] and [t] exemplars.

5,5: NG10: ng → [ŋ] /__#, e.g., ring

Unit 5 introduces Rule NG10 in one-syllable exemplars. NG10 is included in Block 5 because its [ŋ] pronunciation was introduced in 5,2 for the -ing suffix. It is suggested that the first NG10 exemplars to be introduced be those in which the vowel is i (e.g., ring, sing, thing, wing) since readers would already be familiar with the -ing correspondence.

As discussed in Block 2, the Rule NG10 could be sequenced with the digraphs SH10, TH11, and TH13. The revision would be appropriate if the -ing suffix were sequenced in Block 1; moreover, Rule NG10 itself is of high frequency, and its individual exemplars are too.

Block 6:   Frequency = 260 (General primary vowel Rule 11)

Unit 1:   E18, A11 (109), I11 (68)   Frequency = 177

Unit 2:   O11 (60), U11 (16), E11 (3), EE10 + E18 (4)   Frequency = 83

Block 6 introduces general primary vowel Rule 11, the VCe long-vowel rule, which is the second most frequent type of vowel rule after general primary vowel Rules 15 and 16, the short-vowel rules. The five individual rules are ordered by frequency and divided into two units to lessen the learning load. The VCe rules are the first rules in the sequence for which the determining environment specifies a particular letter (final silent e), and these rules should be contrasted with the VC(C) short vowel environmental characteristics (e.g., cap-cape, bit-bite). Rule E18 covering the final silent e in VCe words can also be contrasted with Rule E25 (3,1) covering the pronounced final e in one-vowel exemplars such as he.

When the consonant in VCe words is r, the pronunciation of the vowel is often affected, particularly as noted below. In some dialects the r is not pronounced, or is pronounced as [ə].

6,1: E18:   e → ∅ /__#, e.g., name, (edge)

A11:   a → [e] /__Ce#, e.g., name

I11:   i → [ay] /__Ce#, e.g., fine

E18:   Final e is silent, except when part of a secondary vowel or when the only vowel in a word (see Rule E25). Final silent e performs a number of functions (see Jespersen, 1965, p. 193). Its primary use is as a marker of the long-vowel pronunciation in general primary vowel Rule 11. It also marks the pronunciation of c, g, and th (see Rules C11, G11, and TH12). A final e after s in some words differentiates between a base form (e.g., dense) and an inflected form (e.g., dens). The letters v and u generally do not occur finally, but rather are followed by an e; e.g., have, continue. Sometimes final e may have two functions, as in nice where it marks both the i → [ay] (Rule I11) and the c → [s] (Rule C11) correspondences.

A11:   Rule A11 generally is automatically pronounced [ɛ] (or [æ] in some dialects) in an /__re environment.

6,2: O11:   o → [o] /__Ce#, e.g., home

U11: $\underline{u} \rightarrow [(y)u] / \_\_Ce\#$, e.g., <u>cute</u>, <u>crude</u>

E11: $\underline{e} \rightarrow [\iota] / \_\_Ce\#$, e.g., <u>eve</u>

O11: Rule O11 has the dialect variation [o], [ɔ], [a] in the /__re environment.

U11: Some exemplars of Rule U11 are always pronounced [yu], some are always pronounced [u], and others can be pronounced either way. When following [r] or [l], it is always [u]; when following [t, d, s, z, š, ž, č, ǰ, n], it is generally [u], although there is some dialect variation. When following vowels or other consonants, it is generally [yu]; when word initial, it is always [yu]. The [yu] and [u] pronunciations are designated for the exemplars in the word list in Section IV.

E11: Because of its low frequency, Rule E11 may be postponed.

<u>Block 7: Frequency = 36</u> (C11, G11; Suffixes with general primary vowel Rule 11)

Unit 1: C11 (26), G11 (10)   Frequency = 36

Unit 2: <u>-s</u>, <u>-d</u>, and <u>-ing</u> suffixes added to words with general primary vowel Rule 11

7,1: C11: $\underline{c} \rightarrow [s] / \_\_\begin{Bmatrix} e \\ i \\ y \end{Bmatrix}$, e.g., <u>cent</u>, <u>lace</u>, (<u>city</u>), (<u>cypress</u>)

G11: $\underline{g} \rightarrow [ǰ] / \_\_\begin{Bmatrix} e \\ i \\ y \end{Bmatrix}$, e.g., <u>gem</u>, <u>age</u>, <u>gin</u>, (<u>gym</u>)

This unit introduces the alternative pronunciation of $\underline{c}$ and $\underline{g}$. These rules state that $\underline{c} \rightarrow [s]$ and $\underline{g} \rightarrow [ǰ]$ when followed by $\underline{e}$, $\underline{i}$, or $\underline{y}$. These correspondences require discrimination of an environment which may occur in various places in a word, and which specifies several alternate letter choices as determiners of the application of the rule. Rules C11 and G11 are sequenced to follow instruction on general primary vowel Rule 11 because they most often occur in the <u>VCe</u> environment, as <u>Vce</u> and <u>Vge</u>. Not all environments of Rules C11 and G11 are exemplified in this unit. Their first occurrences are as follows: C11 /__i, 9,2; C11 /__y, 17,2; G11 /__y, 10,2.

When the environments for C11 and G11 are contrasted with the more frequent environments for C12 and G12, it should be pointed out to the readers that C11 and G11 most often occur in a <u>VCe</u> environment and that C12 and G12 cannot occur in this environment. The G12 pronunciation, [g], however, can occur initially or medially when followed by $\underline{e}$ or $\underline{i}$; e.g., <u>get</u>, <u>girl</u>. These frequent exceptions to

G11 are coded as G31 and are sequenced in 11,6. Other exceptions to Rules G11 and C11 involve palatalizations (see Section VII).

The letter combination sc is pronounced [s] when it precedes e, i, or y as in scene and scissors. This is the result of application of Rules S10 and C11 (sc → //ss//) and then leveling of the double consonant (//ss// → [s]).

7,2: -s, -d and -ing suffixes added to words with general primary vowel Rule 11, e.g., races, raced, racing

Unit 2 introduces the -s, -d, and -ing suffixes for base words with general primary vowel Rule 11, just as Block 5 introduced these suffixes for base words with general primary vowel Rule 15. For the -s suffix, the final e remains and is silent, except when the final consonant is c, g, s, or z; then the suffix is automatically pronounced [ɪz]. For the -d suffix the final e remains and is silent, except when the final consonant is d or t; then the -ed suffix is pronounced [ɪd]. For the -ing suffix, the e is dropped. Exemplars for these base words plus suffixes are presently uncoded although the base words themselves are coded and are sequenced for instruction in Blocks 6 and 7.

Block 8: Frequency = 68 (Two-syllable words, first syllable stressed)

Unit 1: Compounds with rules in Blocks 5-7   Frequency = 45

Unit 2: A16 (6), I16 (3), U16 (3), E16 (2), O16 (9)   Frequency = 23

Block 8 is, in effect, a review block and a further step in the gradual introduction of two-syllable words.

8,1: Compounds with rules in Blocks 5-7, e.g., livestock

All but two of the compounds, which involve rules from Blocks 5-7, have general primary vowel Rule 11 in them. For the compounds which have such correspondences in the first part of the compound, it should be noted that it is because these exemplars are compounds that the e, now in the middle of the bigger word, is still silent and not pronounced.

8,2: A16: a → [æ] /__CC..., e.g., accent

I16: i → [ɪ] /__CC..., e.g., insect

U16: u → [ə] /__CC..., e.g., umpire

E16: e → [ɛ] /__CC .., e.g., reptile

O16: o → [a] /__CC..., e.g., costume

Unit 2 introduces general primary vowel Rule 16 in two-syllable words with the first syllable stressed. Rule 16 has the same short-vowel pronunciation in a /__CC... environment as general primary vowel Rule 15, taught in First Year, did in a /__C(C)# environment. This is the first instance in the sequence of two-syllable words other than compounds and base words plus suffixes. Only exemplars having the first syllable stressed are taught here so that readers will not have to consider stress as well as length. Words with the second syllable stressed, which are less frequent, are not introduced until the end of Block 10, and could even be postponed until the end of this Second Year sequence.

In Berdiansky et al. (1969) u in the environment /__rC was coded U16. However, because of the effects of [r] on the pronunciation of vowels, such words have been recoded U21 and sequenced in Block 9 with the other Vr exemplars.

Block 9: Frequency = 323 (Vowels before r)

Unit 1: one-syllable: A21 (40), O21 (26), U21 (15), I21 (14), E21 (12)   Frequency = 107

Unit 2: two syllables, first syllable stressed: E21 (151), U21 (5), I21 (4), A21 (18), O21 (15) Frequency = 193

Unit 3: A25 (11), O22 (12)   Frequency = 23

Block 9 introduces the next most frequent primary-vowel rules (after short and long vowels) in one-syllable words: those covering the pronunciation of a vowel when followed by r. Rules E21, I21, and U21 specify the same pronunciation, [ər] (phonetically one sound), and are grouped together for this reason. These three rules have the same pronunciation whether they are stressed or unstressed.

In some dialects, the r following a vowel is not pronounced (Rules E21, I21, and U21, e.g., fur [fə]), or is pronounced as [ə] (Rule O21, e.g., for [foə]), or results in a lengthening of the vowel (Rule A21, e.g., farm [fa:m]).

The Vr rules are followed by A25 and O22, which are rules covering exceptions to A21 and O21 in which a different pronunciation occurs when ar or or are preceded by w. These rules also provide the first instance in the sequence of a correspondence with an environment specifying what precedes as well as what follows the letter involved.

9,1: A21: a → [a] /__{$\begin{matrix}rC\\r\#\end{matrix}$}, e.g., cart, car

O21: o → [o], [ɔ], [a] /__{$\begin{matrix}rC\\r\#\end{matrix}$}, e.g., horn, for

U21: $\underline{u} \to$ [ə] $/\underline{\quad}\{^{rC}_{r\#}\}$, e.g., <u>burn</u>, <u>fur</u>

I21: $\underline{i} \to$ [ə] $/\underline{\quad}\{^{rC}_{r\#}\}$, e.g., <u>bird</u>, <u>sir</u>

E21: $\underline{e} \to$ [ə] $/\underline{\quad}\{^{rC}_{r\#}\}$, e.g., <u>herd</u>, <u>her</u>

Unit 1 introduces Vowel 21 rules in one-syllable words.

U21: Double consonant Rule RR10 is first exemplified here.

021: There is considerable dialect variation in the pronunciation of <u>or</u>, but most individual speakers will use only one pronunciation.

9,2: E21: $\underline{e} \to$ [ə] $/\underline{\quad}\{^{rC}_{r\#}\}$, e.g., <u>western</u>, <u>father</u>
(plus -<u>er</u> suffix with previously introduced words, e.g., <u>banker</u>.)

U21: $\underline{u} \to$ [ə] $/\underline{\quad}\{^{rC}_{r\#}\}$, e.g., <u>sunburn</u>, <u>murmur</u>

I21: $\underline{i} \to$ [ə] $/\underline{\quad}\{^{rC}_{r\#}\}$, e.g., <u>birdseed</u>

A21: $\underline{a} \to$ [a] $/\underline{\quad}\{^{rC}_{r\#}\}$, e.g., <u>farmer</u>, <u>streetcar</u>

021: $\underline{o} \to$ [o], [ɔ], [a] $/\underline{\quad}\{^{rC}_{r\#}\}$, e.g., <u>order</u>

Unit 2 introduces the Vowel 21 rules in two-syllable words having the first syllable stressed. Double consonant Rules BB10, MM10, and PP10 are first exemplified in this unit.

E21: E21 is taught first in Unit 2 because it has far more exemplars than any of the other Vowel 21 rules. The unstressed forms of <u>er</u> are allowed both because of their high frequency and because their pronunciation [ər] is the same as for stressed E21, taught in 9,1.

Instruction on E21 in Unit 2 commences with the -<u>er</u> agent noun forms and comparative adjective forms of base words, including those in which the final consonant is doubled before the -<u>er</u>. Agent and comparative forms of other previously taught words can also be taught here. The -<u>er</u> suffix with words ending in final silent <u>e</u> (e.g., <u>baker</u>) are not sequenced here (instead, at 17,2), but could be if desired.

In most dialects, base words ending in <u>ng</u> retain their regular NG10 pronunciation, [ŋ], when the -<u>er</u> agent form suffix is added, but change to a [ŋg] pronunciation for the -<u>er</u> comparative form; e.g., <u>singer</u> vs. <u>stronger</u>.

I21 & U21: I21 and U21 also have the same pronunciation, [ər], when stressed or unstressed but there are no lexicon exemplars of unstressed <u>ir</u>.

A21 & O21: Unstressed <u>ar</u> and <u>or</u> receive instruction in 10,1 with other unstressed vowels rather than here, since their unstressed pronunciation, [ər], differs from their stressed pronunciations.

9,3: A25: $\underline{a} \rightarrow [o] / \begin{Bmatrix} w \\ wh \\ qu \end{Bmatrix} \_\_r$, e.g., <u>war</u>, (<u>wharf</u>), (<u>quart</u>)

O22: $\underline{o} \rightarrow [ə] / w\_\_rC$, e.g., <u>word</u>, <u>worth</u>

Rules A25 and O22 share the /w__rC environment, but A25 also occurs in additional environments.

A25: Rule A25 provides for the pronunciation of <u>ar</u> when preceded by [w], whether spelled <u>w</u>, <u>wh</u> ([hw] or [w]), or <u>qu</u> ([kw]). Only the /w__r environment is introduced here. The /wh__r and /qu__r environments enter the sequence in 11,3 and 11,4 with WH10 and QU10, respectively. A25 has possible dialect variation which may be acknowledged if necessary. The only exception to A25 is -<u>ward</u> when it is an unstressed syllable (i.e., <u>awkward</u>, <u>forward</u>), in which case the pronunciation of the <u>ar</u> is [ər], just as it is for any other unstressed <u>Vr</u> (10,1).

O22: O22 occurs in a /w__rC environment (e.g., <u>work</u>). The only exception to O22 is the word <u>worn</u> (derived from <u>wore</u>), which is covered by Rule O21.

<u>Block 10: Frequency = 575</u> (Unstressed vowels; Two-syllable words with second syllable stressed)

Unit 1: General primary vowel Rule 17, first syllable stressed: I17 (34), U17 (6), E17 (89), A17 (45), O17 (37)
Frequency = 211

Unit 2: Y17 (143), LE22 (84) Frequency = 227

Unit 3: Compounds, second syllable stressed Frequency = 8

Unit 4: Two-syllable words, second syllable stressed: I16 (14), U16 (5), A16 (3), O16 (2), E21 (5), O21 (2), EE10 (9)
Frequency = 40

Unit 5: General primary vowel Rule 17, second syllable stressed: A17 (38), E17 (20), O17 (24), U17 (5), I17 (2)
Frequency = 89

Block 10 introduces the unstressed ([ə] or [ɪ]) pronunciation of unstressed vowels. Not all unstressed vowels are reduced to a [ə] or [ɪ] pronunciation, and for any one speaker, a given vowel when reduced may be pronounced [ə] in one word and [ɪ] in another word

(e.g., for some speakers, the u in circus would be pronounced [ɪ], while the u in album would be pronounced [ə]). Beginning readers often have difficulty with the unstressed vowel concept because when they are first learning to decode words, they tend to give a stressed pronunciation to all the vowels. This problem, however, will probably be largely overcome as the readers become more familiar with stress variation. In regard to stress patterns, readers may benefit from the information that there are many times more words with the first syllable stressed than with the second syllable stressed. In the SWRL lexicon, the ratios are 4:1 for two-syllable words and 2:1 for three-syllable words. Four-syllable words have more complex stress patterns.

10,1: (First syllable stressed)

I17: i → [ə], [ɪ] in unstressed syllables, e.g., <u>pilgrim</u>, <u>furnish</u>

U17: u → [ə], [ɪ] in unstressed syllables, e.g., <u>album</u>, <u>campus</u>

E17: e → [ə], [ɪ] in unstressed syllables, e.g., <u>tunnel</u>, <u>hidden</u>

A17: a → [ə], [ɪ] in unstressed syllables, e.g., <u>final</u>, <u>canvas</u>

O17: o → [ə], [ɪ] in unstressed syllables, e.g., <u>cotton</u>, <u>actor</u>

Unit 1 commences with Rules I17 and U17 because the unstressed pronunciation of each is often the same as its short pronunciation ([ɪ] and [ə], respectively). Rules E17, A17, and O17 are then sequenced by frequency.

U17: This rule was used only with words in which [ə] could not be indicated by using Rules U15 and U16, when u appeared in an unstressed syllable.

E17: Superlatives (-<u>est</u>) of base words are uncoded in the lexicon but should be taught with E17, perhaps as the first exemplars of this rule. For the suffixes -<u>less</u>, -<u>ness</u>, -<u>en</u>, and -<u>ed</u>, these forms added to any previously taught base words may be used, as well as the lexicon exemplars.

A17 & O17: A17 and O17 exemplars in the environment /__r should be noted carefully because <u>ar</u> and <u>or</u> change from Rules A21 and O21 pronunciations when stressed to A17 and O17 pronunciations ([ər]) when unstressed. On the other hand, <u>er</u>, <u>ir</u>, and <u>ur</u> have the same pronunciation ([ər]) when either stressed or unstressed.

10,2: Y17: $\underline{y} \rightarrow [\imath]$ /__# in unstressed syllables, e.g., <u>candy</u>

LE22: ₀<u>le</u> → [əl] /C__#, e.g., <u>little</u>

.The rules Y17 and LE22 are included in Block 10 with unstressed vowels because they are always unstressed. These two rules occur at the end of the second syllable in words having the first syllable stressed. They might thus precede the unstressed vowels of 10,1. All their exemplars occur in the environment /...C__#.

LE22: The grapheme unit <u>le</u> is invariantly pronounced [əl] (phonetically one sound: syllabic [l]) as in LE22 when in the environment /...C__# (cf, <u>le</u> → [l] /V__#, e.g., <u>pale</u>).

Y17: The pronunciation of Y17, unstressed <u>y</u> in word-final position, may vary between [l] and [ɪ]. In isolation [l] is more common, but unstressed [ɪ] (cf, general <u>primary vowel Rule 17</u>) is often used in connected speech.

Y17 primarily occurs in the -<u>ly</u> adverbial suffix and -<u>y</u> adjectival suffix. The rule is productive and uncomplex allowing for additional practice on previously introduced rules contained in its exemplars. For both Y17 and Y19 (introduced in 3,2), the <u>y</u> remains when -<u>ing</u> is added (e.g., <u>trying, hurrying</u>) and before other suffixes beginning with the letter <u>i</u> (e.g., -<u>ish</u>, -<u>ist</u>). Before suffixes not beginning with the letter <u>i</u>, however, in both Y17 and Y19 the <u>y</u> changes to <u>i</u>, retaining the <u>y</u> pronunciation of the base word. For past tense and for plural and third person singular forms, -<u>ed</u> and -<u>es</u>, respectively, are added, e.g., <u>tried, hurried; tries, hurries</u>. Y17 also changes to <u>i</u> before other suffixes not beginning with the letter <u>i</u> (e.g., -<u>er</u>, -<u>est</u>, -<u>less</u>, -<u>ly</u>, -<u>ment</u>, -<u>ness</u>). Before these same suffixes, however, Y19 is unpredictable as to whether it changes to <u>i</u> or remains <u>y</u>.

10,3: Compounds (second syllable stressed), e.g., <u>herself</u>

Units 3-5 introduce two-syllable words having the second syllable stressed. Heretofore in the sequence, the two-syllable words taught have had the first syllable stressed. In these units exemplars with the second syllable stressed are introduced, thus providing the contrast necessary for identifying the concept of stress. The first exemplars with the second syllable stressed are compounds, presented in Unit 3, all composed of previously taught rules. Non-lexicon compounds of other previously taught base words are also allowed.

10,4: (Second syllable stressed)

I16: $\underline{i} \rightarrow [\imath]$ /__CC..., e.g., <u>inform</u>

U16: $\underline{u} \to [\ni] /\_\_CC\ldots$, e.g., <u>unless</u>

A16: $\underline{a} \to [\ae] /\_\_CC\ldots$, e.g., <u>accept</u>

O16: $\underline{o} \to [a] /\_\_CC\ldots$, e.g., <u>trombone</u>

E21: $\underline{e} \to [\ni] /\_\_\{^{rC}_{r\#}\}$, e.g., <u>perhaps</u>, (<u>prefer</u>)

O21: $\underline{o} \to [o], [\mathfrak{d}], [a] /\_\_\{^{rC}_{r\#}\}$, e.g., <u>cornet</u>

EE10: $\underline{ee} \to [\mathfrak{i}]$, e.g., <u>indeed</u>

Unit 4 introduces noncompound two-syllable words with the second syllable stressed, utilizing all previously taught rules, except general primary vowel Rule 17, that could have such exemplars at this point in the sequence. Many of the exemplars involve prefixes such as <u>in-</u>, <u>dis-</u>, <u>un-</u>.

10,5: (Second syllable stressed)

A17: $\underline{a} \to [\ni]$, $[\mathfrak{i}]$ in unstressed syllables, e.g., <u>alike</u>

E17: $\underline{e} \to [\ni]$, $[\mathfrak{i}]$ in unstressed syllables, e.g., <u>except</u>

O17: $\underline{o} \to [\ni]$, $[\mathfrak{i}]$ in unstressed syllables, e.g., <u>connect</u>

U17: $\underline{u} \to [\ni]$, $[\mathfrak{i}]$ in unstressed syllables, e.g., <u>subtract</u>

I17: $\underline{i} \to [\ni]$, $[\mathfrak{i}]$ in unstressed syllables, e.g., <u>divide</u>

Unit 5 introduces general primary vowel Rule 17 exemplars which are two-syllable words having the second syllable stressed. Most of these exemplars involve prefixes, such as <u>a-</u>, <u>ex-</u>, <u>con-</u>, <u>pro-</u>.

<u>Block 11</u>: <u>Frequency = 214</u> (Consonant digraphs; GG10, CC12, G31)

Unit 1: NG10   Frequency = 41

Unit 2: CH10 (68), TCH10 (29)   Frequency = 97

Unit 3: WH10   Frequency = 23

Unit 4: QU10   Frequency = 24

Unit 5: GG10 (17), CC12 (2)   Frequency = 19

Unit 6: G31   Frequency = 10

Block 11 introduces rules for the common consonant digraphs ch, wh, and qu; the remaining digraphs, all of low frequency, are introduced in Block 20. Also covered are nonverb exemplars of NG10, the double consonant rules GG10 and CC12, and Rule G31, a common exception to G11.

11,1: NG10 (two syllables): ng → [ŋ] /__#, e.g., dressing

Rule NG10 (first introduced in Block 5) is used here in two-syllable words. Many of the words are suffixed forms with -ing which have specialized noun or adjective uses, e.g., spelling, thrilling. These exemplars can also be verbs and so could be sequenced in 5,2 with the uncoded -ing verb forms of base words. This unit also includes NG10 in exemplars which are not verb, noun, or adjective forms derived from base words (e.g., cunning, darling). These too, are sequenced here, but if the noun and adjective forms are moved up in the sequence, these could be as well. The sequence ng has other pronunciations besides [ŋ]: [ŋg] (N20 + G12 or N20 + G31) and [ŋǰ] (N10 + G11). These correspondences may be introduced in individual words as they occur, without special note.

11,2: CH10: ch → [č], e.g., church

TCH10: tch → [č], e.g., match

Rules CH10 and TCH10 are sequenced together in Unit 2 because of their shared pronunciation, [č], and complementary distributions. CH10 occurs primarily in word-initial position and following a consonant or secondary vowel in word-final position. TCH10, on the other hand, does not occur initially, and it primarily occurs following a short vowel in word-final position. Base words ending in ch and tch use -es plural and third person singular suffixes, which should be included in this unit.

The grapheme unit tch is invariantly pronounced [č] as in TCH10; ch may also be pronounced [k] (Rule CH31, 20,2) and [š].

11,3: WH10: wh → [hw] or [w], e.g., when

Rule WH10 has the dialect variation [w] or [hw]. In addition, wh may be irregularly pronounced [h], e.g., who. Exemplars of Rule A25 (see 9,3) in the environment /wh__r, are introduced in this unit.

11,4: QU10: qu → [kw], e.g., quick

The sequence qu is considered a grapheme unit because, in English words, the letter q is always followed by u. The grapheme unit qu, has only two pronunciations: [kw] as in QU10, and, irregularly, [k]. The exemplars for Rule A25 (see 9,3) which occur in the environment /qu__r are introduced in this unit.

11,5: GG10: <u>gg</u> → [g], e.g., <u>egg</u>, <u>wiggle</u>

CC12: <u>cc</u> → [k] / __ $\begin{Bmatrix} a \\ o \\ u \end{Bmatrix}$, e.g., <u>yucca</u>, <u>accord</u>, <u>hiccup</u>

The double consonant rules GG10 and CC12 are sequenced in 11,5 rather than in 4,2 and 4,3 with C12 and G12 because all of their exemplars (except <u>egg</u>) occur in two-syllable words and most of these exemplars include rules introduced in Block 10.

GG10: The grapheme unit <u>gg</u> is invariantly pronounced [g] as in GG10, except in a few words such as <u>suggest</u>, where the [gʒ] pronunciation is determined by the following vowel.

CC12: The grapheme unit <u>cc</u> has two pronunciations: [k] as in CC12, and [ks] as in CC11. Both of these rules have so few exemplars (CC12: 9, and only two of these can enter the sequence here; CC11: 6) that it might be advisable to postpone instruction on CC12 until 20,4, where CC11 and the other lowest frequency consonants are sequenced.

11,6: G31: <u>g</u> → [g], e.g., <u>get</u>, <u>girl</u>

G31 is an exception to Rule G11, which has the same / __ $\begin{Bmatrix} e \\ i \\ y \end{Bmatrix}$ environment. As an alternative to sequencing G31 here in Block 11, its one-syllable exemplars could be taught either with Rule G12 (<u>g</u> → [g]) in 4,3, or as exceptions to Rule G11 in 7,1 (although there would only be four exemplars at either point). The two-syllable <u>nger</u> exemplars of G31 could then be introduced in Block 11 or in Third Year.

Block 12:   Frequency = 486 (High-frequency secondary vowels)

Unit 1: AY10   Frequency = 51

Unit 2: EA11 (145), EA31 (44)   Frequency = 189

Unit 3: OO12 (89), OO11 (54)   Frequency = 143

Unit 4: OW11 (60), OW12 (43)   Frequency = 103

The only secondary vowel rule to have entered the sequence before Block 12 is Rule EE10, which was introduced in 3,1 because of its high rule frequency and its high individual exemplar frequencies. Also, since the grapheme unit <u>ee</u> has the same pronunciation as its individual letter's name ([i], <u>e</u>), EE10 is considered to be instructionally uncomplex. The other secondary vowel rules have been divided into three groupings according to the combined considerations of frequency, contrasting homographs (i.e., same spelling but different pronunciations), and homophones (i.e., same pronunciation but different spellings), a number of which are in complementary distribution.

The first group of secondary vowels, introduced here, have high rule frequencies and high individual exemplar frequencies. Three of the rule pairs have contrasting homograph correspondences presented with them. The second group of secondary vowels, introduced in Block 16, have medium frequencies (with the exception of high-frequency AI10 and OU10, which could be resequenced into this block); the third group of secondary vowels, introduced in Block 26, have low rule frequencies.

The contrasting correspondences for the grapheme units ea, oo, and ow are sequenced together because each correspondence has a high rule frequency and/or high individual exemplar frequencies and because none has specifiable environmental constraints which are simple enough for the younger reader to remember. If it is found that it is not practical to teach alternate pronunciations simultaneously, then the contrasting correspondences could be sequenced in a later block.

12,1: AY10: ay → [e], e.g., day

The introduction of secondary vowels in Block 12 commences with Rule AY10 because of that rule's regularity and its high individual exemplar frequencies. The grapheme unit ay is invariantly pronounced [e] as in AY10, except for aye and says (although, in unstressed syllables, ay may be pronounced [i] or [ɪ], e.g., Sunday).

If the learning load will allow, it is possible to sequence Rule AI10 here with AY10 rather than in 16,1, as at present. As well as having a high rule frequency, Rule AI10 has the same pronunciation as, and is in complementary distribution with, AY10. The letters i and y, and u and w, are in complementary distribution in several secondary vowels: ai/ay; au/aw; ei/ey; eu/ew; oi/oy; and ou/ow. In general, y and w are found in word-final position and i and u elsewhere (e.g., day/daily; coy/coil), although this pattern does not always hold. Secondary vowels, in fact, are generally limited in their distribution; e.g., several of them do not occur initially.

12,2: EA11: ea → [i], e.g., each

EA31: ea → [ɛ], e.g., bread

EA11 and EA31 share most of their environments, so it is very difficult to give readers a basis for determining the correct pronunciation of the grapheme unit ea, except that EA11 does have three times more exemplars than EA31. Some homographs with ea can be distinguished only by their grammatical function, e.g., lead. EA11 and EA31 sometimes alternate for present and past tenses, e.g., read/read, mean/meant.

The following environments apply to EA11, but not EA31: /__#, c, ch, g, l, m, p, sh; se, son, sy, ture, the. The last five are introduced in Third Year, where their component rules (e.g., S20) are sequenced.

The environment /__1th·applies to EA31, but not EA11. The environments /__ sant, ther, sure, also apply to EA31, but not to EA11; the first two will be introduced in Third Year, the latter in Section VII.

Other environments, e.g., /__$\begin{Bmatrix} d \\ f \\ r \end{Bmatrix}$, apply both to EA11 and EA31.

12,3: OO11: <u>oo</u> → [u], e.g., <u>broom</u>

   OO12: <u>oo</u> → [ʊ], e.g., <u>book</u>

The following environments apply to OO11, but not to OO12: /__#, n, m, p, st, th; h, se. The last two will be introduced in Third Year. There is no environment that applies only to OO12 and not to OO11, although the environment /__k applies primarily to OO12.

12,4: OW11: <u>ow</u> → [o], e.g., <u>below, own</u>

   OW12: <u>ow</u> → [aw], e.g., <u>allow, owl</u>

The grapheme unit <u>ow</u> has only two pronunciations: [o] as in OW11, and [aw] as in OW12, except for the word <u>knowledge</u>. Also, in some dialects, an unstressed <u>ow</u> is pronounced [ə], e.g., <u>fellow</u>.

The primary environment for OW11 is /__#, particularly at the end of two-syllable words, but a number of OW12 words have the /__# environment in one-syllable words. There are no other specifiable environments to distinguish the use of [o] or [aw] for the grapheme unit <u>ow</u>.

Because of its high frequency and its being in complementary distribution with OW12 (<u>ow</u> → [aw]), Rule OU10 (<u>ou</u> → [aw]) could be appropriately sequenced, following OW12, in this block rather than in 16,2 with the medium-frequency secondary vowels.

<u>Block 13:</u>   Frequency = 198 (Additional common primary vowel rules)

   Unit 1: O31 (38), U31 (35)   Frequency = 73

   Unit 2: A23 (26), O23 (26)   Frequency = 52

   Unit 3: I22 (21), O24 (52)   Frequency = 73

Block 13 introduces some additional common rules for primary vowels. Teaching these rules, rather than just teaching as sight words the high-frequency words containing these rules, not only allows the introduction of additional lower frequency words, but continues the emphasis on the regularity of English spelling-to-sound correspondences. Instruction can be based on specifiable environments, when this is a rule characteristic. When not, the exemplars can be taught as groups of words, each group manifesting an exception to previously learned rules. The rules vary in predictability from the highly predictable Rule A23 to the unpredictable O31.

13,1: O31: <u>o</u> → [ə], e.g., <u>won</u>, <u>love</u>

U31: <u>u</u> → [ʊ], e.g., <u>bull</u>, <u>push</u>

O31: Rule O31 occurs in stressed syllables where other pronuncia-tions would be expected. In fact, there are no O31 environments which do not also apply to other <u>o</u> rules. Rule O31 generally occurs in the following environments: /__ n, m, th, v.

U31: Rule U31 occurs primarily in the suffix, -<u>ful</u>, as well as in the word <u>full</u> and compounds of it. Otherwise, its environments are generally /$\{^b_p\}$__$\{^{11}_{sh}\}$. No other rules for the letter <u>u</u> (e.g., U15, U16, U17) have these environments.

13,2: A23: <u>a</u> → [ɔ] /__ $\begin{Bmatrix} 11 \\ 1d \\ 1t \\ 1k \end{Bmatrix}$ #, e.g., <u>ball</u>, <u>bald</u>, <u>salt</u>, (<u>walk</u>)

O23: <u>o</u> → [o] /__1C#, e.g., <u>roll</u>, <u>told</u>, <u>colt</u>, (<u>yolk</u>)

Unit 2 introduces Rules A23 and O23, both of which occur in the environments /__ $\begin{Bmatrix} 11 \\ 1d \\ 1t \end{Bmatrix}$#. Rules A23 and O23 also occur in the environment

/__1k, but these exemplars, due to the silent <u>1</u>, are not introduced until 19,5.

O23: Rules O23 also applies in the environment /__1# in stressed syllables. The only lexicon exemplars are <u>control</u> and <u>patrol</u>, which are presently coded as exceptions, but which could be sequenced in this unit.

13,3: I22: <u>i</u> → [ay] /__ $\begin{Bmatrix} nd \\ 1d \\ gn \end{Bmatrix}$#, e.g., <u>find</u>, <u>wild</u>, (<u>sign</u>)

O24: <u>o</u> → [ɔ] or [a] /__ $\begin{Bmatrix} fC \\ g\# \\ ng \\ nk \\ ss \\ st \\ th \end{Bmatrix}$, e.g., <u>soft</u>, <u>dog</u>, <u>song</u>, <u>honk</u>, <u>moss</u>, <u>lost</u>, <u>moth</u>

I22: Rule I22 is introduced in the environments /__$\{^{nd\#}_{1d\#}\}$. It also occurs in the environment /__gn#; these exemplars, due to the silent <u>g</u> (Rule G20), are sequenced in 19,3 with the introduction of silent letters.

O24: The environments /__ $\begin{Bmatrix} fC \\ g\# \\ ng \\ nk \end{Bmatrix}$ apply to Rule O24, but not to any

other o rules. The following environments apply to Rule 024, but
also to other o rules: /__$\left\{\begin{array}{l} ss \\ st \\ th \end{array}\right\}$. The environment /__st will be deleted
from future versions of this rule since there are nearly as many excep-
tions (pronounced [o]) as exemplars (cf, lost and most).

Rule 024, as with any rule involving [ɔ], has the dialect variant
[a]. In dialects without [ɔ], this rule does not differ from Rule 015.
In dialects where [a] and [ɔ] contrast, the occurrences of these sounds
"is highly erratic, varying not only regionally, but also from word to
word" (Kurath, 1964, p. 112).

<u>Block 14</u>: <u>Frequency = 85</u> (Nonlong vowels in <u>VC(C)e</u> words)

    Unit 1: Stressed <u>VCCe#</u>   Frequency = 40

    Unit 2: Stressed <u>VrCe#</u>   Frequency = 18

    Unit 3: Unstressed <u>VCCe#</u> and <u>VCe#</u>   Frequency = 27

Block 14 introduces the short vowel pronunciations in the environ-
ment /__CCe, which is similar to both the previously specified short
vowel (/__CC) and long vowel (/__Ce) rules. In the case of VCCe
exemplars, however, the final silent e does not mark a long vowel pronun-
ciation, but rather the e marks a morphemic boundary and/or the pronuncia-
tion of the final consonant. In nearly all of the exemplars in this
block, the final consonant is <u>c</u>, <u>g</u>, <u>s</u>, or <u>v</u>. Without an e following
them, <u>c</u> and <u>g</u> would be pronounced [k] and [g] rather than [s] and [ǰ]
(e.g., compare the nonword <u>sinc</u> with <u>since</u>, and <u>urg</u> with <u>urge</u>). With-
out the marker <u>e</u>, an <u>s</u> might be pronounced [z] or appear to be a plural
(e.g., <u>dens</u> vs. <u>dense</u>). And final <u>v</u> does not occur in English (e.g.,
<u>twelv</u> would be a nonword).

14,1: Stressed <u>VCCe#</u>, e.g., <u>dance</u>

In Unit 1, the major consonants in the <u>VCCe</u> environments of these
short vowels are: <u>dge</u>, <u>nCe</u>, (<u>nce</u>, <u>nge</u>, <u>nse</u>), and <u>lCe</u> (<u>lve</u>, <u>lse</u>, <u>lge</u>),
e.g., <u>badge</u>, <u>dance</u>, and <u>shelve</u>.

14,2: Stressed <u>VrCe#</u>, e.g., <u>nurse</u>

In Unit 2, the consonants in the <u>VrCe</u> environments of these vowels
are: <u>rse</u>, <u>rve</u>, <u>rge</u>, e.g., <u>curse</u>, <u>carve</u>, and <u>charge</u>. As usual, the presence
of <u>r</u> after a vowel affects its pronunciation, based on Rules A21, E21,
I21, O21, and U21 (Block 9).

14,3: Unstressed <u>VCCe#</u> and <u>VCe#</u>, e.g., <u>absence</u>

In Unit 3, the major consonants in the VCCe and VCe environments of the unstressed vowels (general primary vowel Rule 17, Block 10) are: nce, ge, and ce, e.g., absence, bandage, and furnace. If readers are too confused by the nonlong-vowel pronunciations in VCe exemplars, as opposed to the more regular use of general primary vowel Rule 11, then the correspondences and exemplars in this unit could be postponed.
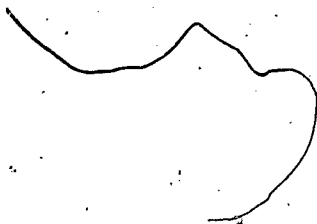
Third Year: Frequency = 3253

(2-3 grade-level words; Three-syllable words; Medium-frequency primary
and secondary vowels; Low-frequency consonants; Silent letters; Major
palatalizations; Affixes; Three-syllable stress patterns)

Block 15:   Frequency = 915 (Review, employing 2-3 words covered by
                            First- and Second-Year rules)

   Unit 1:   2-3 one-syllable words with First-Year rules   Frequency = 84

   Unit 2:   2-3 words with Second-Year rules   Frequency = 831

Block 15 is a review block, employing all 2-3 grade-level words
covered by First- and Second-Year rules. It provides an opportunity
for expanding reading vocabulary by adding more rule-based words
known by the child.

Unit 2 provides for the systematic review of Second Year corres-
pondences. Since grade leveling of the present lexicon is not completely
accurate, some of these words could be added to the Second Year word
list if desired. The words in this unit might also be used for Second
Year word-attack study.

Block 16:   Frequency = 494 (Secondary vowels of medium frequency)

   Unit 1:   AI10   Frequency = 140

   Unit 2:   OU10   Frequency = 98

   Unit 3:   OE10 (7), OA10 (83)   Frequency = 90

   Unit 4:   AW10 (44), AU10 (17)   Frequency = 61

   Unit 5:   OI10 (26), OY10 (22)   Frequency = 48

   Unit 6:   UE10 (20), UI10 (7), EW10 (30)   Frequency = 57

Block 16 introduces secondary vowels of medium frequency. High-
frequency secondary vowels are introduced in Block 12; low-frequency
ones are introduced in Block 26. If desired it would be possible
to move some of the correspondences in Block 16 to one of the other
blocks of secondary vowels, and vice versa.

16,1: AI10: ai → [e], e.g., pain

The secondary vowel ai occurs initially and medially and is in
complementary distribution with ay, which occurs finally (AY10, 12,1)

In some words, ay changes to ai when a suffix is added; e.g., day, daily (cf, -ly, 17,3). For ai in unstressed syllables, see Rule AI17 (26,3). Major exceptions to Rules AI10 and AI17 are said and again, both with [ɛ].

16,2: OU10: ou → [aw], e.g., found

Rule OU10 occurs initially and medially, and is in complementary distribution with Rule OW12 (12,4), which generally occurs finally. There are four other minor pronunciations for ou (introduced in Block 26), although they occur in several high-frequency words.

16,3: OE10: oe → [o] /__#, e.g., toe

     OA10: oa → [o], e.g., boat

Both secondary vowels in this unit are pronounced [o]. OE10 comes first because of its similarity to O11 (6,2) with oCe.

OE10: Rule OE10 occurs in word-final position. Medial oe is generally a combination of o and e, e.g., poet (see Rule O26, 25,2). The major exception to Rule OE10 is the word shoe and its derivatives.

OA10: The major exception to this rule is the word broad and its derivatives.

16,4: AW10: aw → [ɔ], e.g., law

     AU10: au → [ɔ], e.g., cause

These two secondary vowels are in complementary distribution, aw generally occurring finally and au occurring initially and medially. The pronunciation of these secondary vowels is [ɔ], or for some dialects and speakers, [a] (cf, Rule O15).

AW10: This rule is invariant, with no exceptions.

AU10: This rule is nearly invariant, with only a few exceptions, notably laugh and aunt and their derivatives.

16,5: OI10: oi → [oy], e.g., coin

     OY10: oy → [oy], e.g., boy

These two secondary vowels are in complementary distribution, oy generally occurring finally and oi occurring initially and medially. Both rules are nearly invariant, with rather minor exceptions.

16,6. UE10: ue → [(y)u], e.g., due, hue

     UI10: ui → [(y)u], e.g., fruit, juice

EW10: $ew \rightarrow [(y)u]$, e.g., _few_, _new_

All three secondary vowels in this unit have the same pronunciation, $[(y)u]$; see 6,2 for comments on this pronunciation.

UE10: All exceptions to this rule are cases of silent final _ue_ after _g_; i.e., $ue \rightarrow \emptyset \ /g\_\_\#$, e.g., _league_.

UI10: All exceptions to this rule are pronounced $[\imath]$, e.g., _build_, and are classified under Rule UI31 (26,8).

EW10: The secondary vowel _ew_ generally occurs finally and is in complementary distribution with _eu_, which occurs initially and medially. Because of low frequency, a correspondence for _eu_ was not included in the present rule set. However, it is as follows: $eu \rightarrow [(y)u]$, e.g., _feud_, _Eugene_. Rule EW10 is nearly invariant, with the primary exception being _sew_ and its derivatives.

Block 17:   Frequency = 406 (Suffixed and compound three-syllable
                              words; Suffixes)

Unit 1:   Three-syllable compounds.   Frequency = 125

Unit 2:   Two-syllable words with suffixes:
          -_er_ (46), -_en_ (9), -_ing_ (16), -_y_ (14),
          -_s_ (50), -_ed_ (30)   Frequency = 165

Unit 3:   Three-syllable words with suffixes:
          -_er_ (47), -_en_ (3), -_ing_ (12), -_ed_ (6),
          -_ly_ (48)   Frequency = 116

17,1:   Three-syllable compounds

This unit marks the first appearance of three-syllable words. The gradual introduction of three-syllable words continues in the first unit of each block until Block 22, where they are thoroughly taught. At this point and hereafter, it is possible to add three-syllable compounds formed by combining previously taught one- and two-syllable words.

17,2:   Two-syllable words with suffixes: -_er_, -_en_, -_ing_, -_y_, -_s_, -_ed_

These suffixes have been allowed previously, but for instructional purposes this unit contains those base words sequenced after Block 5. Many of the words have a final silent _e_ in their base form; in their suffixed form, the first (long) vowel in the words could also be described by general primary vowel Rule 13 (18,1).

Words coded with Rules E19 and S31 in Berdiansky et al. (1969) have been included in this unit. These rules were used for coding purposes and need not be explicitly taught, since they are not spelling-to-sound correspondences, but automatic phonological alternations.

-s: Most of the words in this unit ending in -s are (1) not plurals, e.g., hers, (2) plurals with no base form, e.g., suds, (3) plurals with a base form not a noun, e.g., blinds, or (4) plurals with a different meaning from the noun base form, e.g., glasses. In addition, in this unit most exemplars of the ending are pronounced [z].

-ed: Most of the words in this unit ending in -ed are past participles commonly used as adjectives (e.g., mashed), sometimes without a base form, (e.g., ashamed) or with a base form not a verb (e.g., famed).

17,3: Three-syllable words with suffixes: -er, -en, -ing, -ed, -ly

At this point and hereafter, the suffixes from this unit plus -(e)s may be added to any two-syllable word to form a three syllable word.

-ed: In this unit, all examples of -ed are pronounced [əd] and form adjectives.

-ly: There is generally no change in a base word when -ly is added. However, if the base ends in unstressed y (Y17: [i]), the y changes to i (I17: [ɪ] or [ə]) when -ly is added, e.g., happily. The suffixed form -fully (e.g., cheerfully) is sometimes pronounced as one syllable [flɪ].

Block 18: Frequency = 518 (Primary-vowel and single-consonant rules of medium frequency)

Unit 1: E13 (123), O13 (73), A13 (43), I13 (39),
        U13 (29)   Frequency = 307

Unit 2: S20 (95), S21 (57)   Frequency = 152

Unit 3: A22   Frequency = 29

Unit 4: O25   Frequency = 30

Block 18 introduces additional primary vowel rules of medium frequency, as well as the remaining correspondences for s. The rules in this block primarily involve multisyllable words.

18,1: E13: e → [i] / __CV, e.g., cedar

O13: $\underline{o} \rightarrow [o]$ /__CV, e.g., <u>open</u>

A13: $\underline{a} \rightarrow [e]$ /__CV, e.g., <u>baby</u>

I13: $\underline{i} \rightarrow [\text{ay}]$ /__CV, e.g., <u>final</u>

U13: $\underline{u} \rightarrow [(y)u]$ /__CV, e.g., ·<u>duty</u>

In this unit, general primary vowel Rule 13 is introduced:
$V \rightarrow [\bar{V}]$ /__CV. This is related to general primary vowel Rule 11
($V \rightarrow [\bar{V}]$ /__Ce#, Block 5), but with the environment extended to all
vowels after a single consonant and to $\underline{e}$ when not in final position.
There are many exceptions ($V \rightarrow [\breve{V}]$ /__CV) to Rule 13, which is one
of the least reliable among the present set of correspondences.
Some exceptions are covered by general primary vowel Rules 27, 28,
and 38 (Block 24).

While there is no adequate solution for handling exceptions
to Rule 13 in terms of spelling-to-sound correspondences, an instruc-
tional solution can be suggested: teach children to have a set for
diversity (cf, Levin & Watson, 1963a, b; Williams, 1968) when encoun-
tering vowels in the environment /__CV (where C ≠ r, which requires
$\underline{Vr}$ rules). A possible decoding strategy is as follows:

1. try a long-vowel pronunciation (Rule 13);

2. if (1) does not produce a known word, try a short-vowel
   pronunciation.

The third step is a more general one which must be used in decoding
words of more than one syllable.

3. if (1) and (2) do not produce a known word, try a schwa
   [ə] pronunciation (a vowel Rule 17 pronunciation).

To develop the above strategy, it is suggested that, after
Rule 13 is taught, exceptions be introduced, perhaps as exemplars
of an exception rule. Exceptions to general primary vowel Rule 13
can be found among the irregularly-spelled words (Section V),
indicated as follows:

$V \rightarrow [\breve{V}]$ /__CV

or: $\underline{a} \rightarrow [\text{æ}]$ /__CV

$\underline{e} \rightarrow [\varepsilon]$ /__CV

$\underline{i} \rightarrow [\text{ɪ}]$ /__CV

$\underline{o} \rightarrow [\text{ä}]$ /__CV

$\underline{u} \rightarrow [\text{ə}]$ /__CV

E13: Many exemplars of this rule involve the prefix re- (e.g., repay) or the pseudo-prefixes be-, de-, pre-, and re-; the e in these unstressed syllables is often pronounced [ɪ] or [ə].

O13: A few of the exemplars of this rule involve the pseudo-prefix pro-. In unstressed syllables the o may be pronounced [ə].

A13: See Rule A22 (18,3) for a in the environment /__rV.

U13: See 6,2 for comments on the pronunciation of [(y)u]. In some words, U13 in the environment /__r may be pronounced [(y)ə], e.g., jury.

18,2: S20: s → [z] /V__V, e.g., nose

S21: s → [s] / $\begin{Bmatrix} a \\ ea \\ oo \\ ou \end{Bmatrix}$ __e, e.g., base, grease, goose, house

Rules S20 and S21 are closely related to general primary vowel Rules 11 and 13 in that they involve the pronunciation of s between two vowels. However, they are especially unstable rules, both having numerous exceptions, in which the opposite correspondence holds.

S20: This rule applies when either V is a primary vowel (including y and silent e) or a secondary vowel. For a few words, Rule S20 applies when the word is used as a verb, but the [s] pronunciation is found when used as a noun or adjective, e.g., use, abuse, close. The following correspondences apply with Rule S20: ea → [i] /__$\begin{Bmatrix} son \\ sy \end{Bmatrix}$ (Rule EA11), e.g., reason, easy; ea → [ɛ] /__sant (Rule EA31), e.g., pleasant.

S21: Rule S21 presents four special environments where Rule S20 does not apply. However, the rule does not work too well in the environment /ea__e, where there are a number of exceptions pronounced with [z] (Rule S20). Rule EA11, ea → [i], and Rule OO11, oo → [u], occur in the environment /__se, e.g., cease, (please), goose.

(Since Rule S21 involves the most common pronunciation of s ([s]), it could be sequenced along with Rules A11, EA11, O11, and OU10. Then when S20 is taught, the environment for S21 could be specified.)

18,3: A22: a → [e], [ɛ], [æ] /__r, e.g., carry

This rule applies in three environments:

1. /__CV, e.g., vary. This is the same environment as for A13, under which the present exemplars could be subsumed. However, they have been placed here because in most dialects their pronunciation is the same as in the environment /__rr. In dialects where pronunciation differs (e.g., Mary [e] and marry [æ] contrast), these words must be coded A13.

2. /__rr, e.g., _arrow_. Rule A22 is particularly needed for this environment which differs from Rule A21 (9,1).

3. Other: The only examples in this category are _scarce_ and _scarcely_ which can be considered as exceptions to Rule A21 (9,1).

Note should be made here--as with all cases involving a vowel followed by _r_--of considerable dialect variation.

18,4: 025: _o_ → [o] /__#, e.g., _go_

This rule is similar to Rules E25 and Y19 (3,1), in that the long-vowel sound corresponds to a letter in final position. However, Rule 025 applies in words of any length.

Block 19: Frequency = 288 (Silent letters)

Unit 1:	Three-syllable words with suffixes: -_ment_ (23), -_or_ (14), -_ive_ (14), -_ness_ (12) -_ance_/-_ant_ (19)	Frequency = 82
Unit 2:	IE11 (8), I24 + GH10 (60), GH10 (13), H20 (7)	Frequency = 88
Unit 3:	K20 (26), G20 (9), W20 (24)	Frequency = 59
Unit 4:	B20	Frequency = 13
Unit 5:	L20 (21), T20 (19)	Frequency = 40
Unit 6:	U20	Frequency = 6

Block 19 introduces three-syllable words with suffixes, and completes the introduction of single consonant correspondences by presenting "silent letters" (generally indicated by a rule numbered "20"), that is, those grapheme units which do not have a corresponding pronunciation.

19,1: Three-syllable words with suffixes: -_ment_, -_or_, -_ive_, -_ness_, -_ance_/-_ant_.

-_ment_ → [mənt], e.g., _agreement_

-_or_ → [ər], e.g., _inventor_

-_ive_ → [ɪv], e.g., _attractive_

-_ness_ → [nɪs] or [nəs], e.g., _eagerness_

-_ance_/-_ant_ → [əns]/[ənt], _assistance_, _assistant_

-**ment**:   The ending -**ment** may occur as a pseudo-suffix, e.g., **department**

-**or**:   The agent suffixes -**or** and -**er** (9,2) have the same meaning and pronunciation.

-**ive**:   Words ending in -**d(e)** change to -**s** (pronounced [s]) when adding -**ive**, e.g., **exclude**, **exclusive** (cf, 21,3).

-**ness**:   When adding -**ness**, final unstressed -**y** (Y17) changes to -**i**, also pronounced [i], e.g., **happy**, **happiness**.

-**ance**/-**ant**:   These two suffixes (also, pseudo-suffixes) are grouped together because of their phonological and orthographical similarity, and because they are both often added to the same bases.

19,2: IE11: **ie** → [ay] /__#, e.g., **die**

I24 + GH10: **igh** → [ay], e.g., **high**

GH10: **gh** → ∅, e.g., **bough**

H20: **h** → ∅ , e.g., **hour**

This unit begins with two cases of the [ay] pronunciation, Rules IE11 and I24 + GH10. It then covers other examples of silent **gh** and concludes with silent **h**.

IE11: This rule applies generally in one-syllable words and in compounds, that is, when stressed. (For unstressed final **ie**, see Rule IE17; medial **ie** is covered by Rule IE12. Both of these rules are introduced in Block 26.)

I24 + GH10: In the present set of correspondences, **igh** is treated as **i** plus silent **gh** (see below). However, it could be treated as one grapheme unit: **igh** → [ay]. There are no exceptions to this correspondence.

GH10: This is the major correspondence for **gh**. The exceptions are:

gh → [g] /#__, e.g., **ghost**;

gh → [g] medially and finally in a few words, e.g., **spaghetti**;

gh → [f] in about ten words, primarily finally, e.g., **laugh**.

H20: This rule includes a group of exceptions (a), plus two regular, but minor, rules (b and c):

a. **h** → ∅ /#__, e.g., **hour**;

b. $h \rightarrow \emptyset$ /__#, e.g., <u>pooh</u>; (One of the few specifiable
environments for Rule 0011 is that <u>oo</u> $\rightarrow$ [u]/__h);

c. $h \rightarrow \emptyset$ /__$V_{unstressed}$, e.g., <u>graham</u>.

19,3: K20: $k \rightarrow \emptyset$ /#__n, e.g., <u>knee</u>

G20: $g \rightarrow \emptyset$ /{$\begin{matrix} \#\_\_n \\ n\_\_\# \end{matrix}$}, e.g., <u>gnat</u>, <u>sign</u>

W20: $w \rightarrow \emptyset$ /#__r, e.g., <u>write</u>

K20: This invariant rule is a result of modern English phonotactics, which does not allow the cluster [kn] at the beginning of words.

G20: This invariant rule is also a result of English phonotactics, which does not allow initial or final [gn]. The environment /#__n is the same as for Rule K20 ([g] is the voiced counterpart of [k]). When the environment is /__n#, a preceding <u>i</u> is governed by Rule I22 (introduced in 13,3): $i \rightarrow$ [ay] /__ gn#, e.g., <u>sign</u>.

W20: This invariant rule is also the result of English phonotactics, which does not allow initial [wr].

19,4: B20: $b \rightarrow \emptyset$ /m__#, e.g., <u>bomb</u>

This invariant rule, like those in 19,3, is a result of modern English phonotactics, which does not allow final [mb].

19,5: L20: $1 \rightarrow \emptyset$/ $\begin{Bmatrix} o\_\_k \\ a\_\_k \\ a\_\_f \\ a\_\_v \\ a\_\_m \end{Bmatrix}$; e.g., <u>yolk</u>, <u>walk</u>, <u>half</u>, <u>salve</u>, <u>palm</u>

T20: $t \rightarrow \emptyset$/$\begin{Bmatrix} s\_\_le \\ s\_\_en \\ f\_\_en \end{Bmatrix}$#, e.g., <u>castle</u>, <u>listen</u>, <u>often</u>

While rules L10 and T20 appear to be invariant, the [l] and the [t] are heard in many words (e.g., <u>calm</u>, <u>often</u>), due to spelling pronunciation.

L20: In addition to Rule L20, Rules 023 and A23 (13,2) apply to the sequences <u>olk</u> and <u>alk</u>, respectively. Most exemplars of the sequence <u>alm</u> are irregular because of the following minor rule: $a \rightarrow$ [a] /__lm, e.g., <u>palm</u>.

T20: Note the alternation between forms ending in <u>t(e)</u> ($\rightarrow$[t]) and those ending with the suffix -en: <u>fast/fasten</u>, <u>haste/hasten</u>, <u>soft/soften</u>.

19,6: U20: $\underline{u} \to \emptyset/\#_g\_\_V$, e.g., <u>guess</u>

The <u>u</u> here is a marker to indicate the [g] pronunciation of <u>g</u>.

<u>Block 20</u>: Frequency = 121 (Consonant digraphs; Double consonants)

    Unit 1: Three-syllable words with suffixes:
          -<u>y</u> (12), -<u>ful</u> (9), -<u>al</u> (7), -<u>able</u> (6),
          -<u>eth</u>(5), -<u>less</u> (4), -<u>ist</u> (4), -<u>ish</u> (2)   Frequency = 49

    Unit 2: PH10 (19), CH31 (20)   Frequency = 39

    Unit 3: TH12   Frequency = 27

    Unit 4: CC11   Frequency = 6

    Block 20 continues the introduction of three-syllable words and concludes the introduction of double consonants and consonant digraphs.

20,1:   Three-syllable words with suffixes: -<u>y</u>, -<u>ful</u>, -<u>al</u>, -<u>able</u>, -<u>eth</u>, -<u>less</u>, -<u>ist</u>, -<u>ish</u>

    -<u>y</u> → [ɪ] (Rule Y17, 9,2), e.g., <u>injury</u>

    -<u>ful</u> → [fuɪ] (Rule U31) or [fəɪ] (Rule U17), e.g., <u>colorful</u>

    -<u>al</u> → [əɪ], e.g., <u>musical</u>

    -<u>able</u> → [əbəɪ], e.g., <u>suitable</u>

    -<u>eth</u> → [ɪθ], e.g., <u>fortieth</u>

    -<u>less</u> → [ɪɪs] or [ɪəs], e.g., <u>odorless</u>

    -<u>ist</u> → [ɪst], e.g., <u>organist</u>

    -<u>ish</u> → [ɪš], e.g., <u>yellowish</u>

    -<u>eth</u>: The suffix -<u>eth</u> is a variant of the ordinal-number suffix -<u>th</u> (as in <u>fourth</u>) and is added to numbers ending in the vowel <u>y</u> (Y17: [ɪ]) which changes to <u>i</u> [ɪ] (Rule I36, 25,3) before -<u>eth</u>, e.g., <u>twentieth</u>.

20,2: PH10: <u>ph</u> → [f], e.g., <u>phone</u>

       CH31: <u>ch</u> → [k], e.g., <u>school</u>

       PH10: This is an invariant correspondence.

CH31: While often unpredictable, this correspondence always holds in the following environment: /#__{$^r_1$}, e.g., <u>chrome</u>, <u>chlorine</u>. The correspondence is generally applicable in more common words with the environment /#s__, e.g., <u>school</u>.

20,3: TH12: <u>th</u> → [ð] /__$\begin{Bmatrix} e \\ er \\ ern \end{Bmatrix}$ #, e.g., <u>breathe</u>, <u>gather</u>, <u>northern</u>

Note the alternation between [θ] (Rule TH11, 3,2) and [ð] in such pairs as <u>wrath/rather</u>, <u>north/northern</u>; this may be an automatic phonological change. Note also the alternation between short vowel plus [θ] and long vowel plus [ð] in such pairs as <u>bath/bathe</u>, <u>breath/breathe</u>; this is a grammatical alternation: nouns versus verbs.

The following correspondences apply with TH12:

<u>o</u> → [ə] /__ther (Rule 031), e.g., <u>brother</u>;

<u>ea</u> → [i] /__the (Rule EA11), e.g., <u>breathe</u>;

<u>ea</u> → [ε] /__ther (Rule EA31), e.g., <u>weather</u>.

20,4: CC11: <u>cc</u> → [ks] /__e, e.g., <u>success</u>.

This rule was not used in Berdiansky et al. (1969), where words were coded C12, C11. (If Rule CC12 is not taught in 11,5, this would be an appropriate place to introduce it.)

Block 21: Frequency = 177 (Palatalizations)

Unit 1: Three-syllable words with prefixes: <u>un-</u> (19), <u>re-</u> (6), <u>dis-</u> (5), <u>in-</u> (4), <u>mis-</u> (3)   Frequency = 37

Unit 2: <u>-tion</u>   Frequency = 81

Unit 3: <u>-sion</u> → [šən] (20), <u>-sion</u> → [žən] (12)   Frequency = 32

Unit 4: <u>-ture</u>   Frequency = 27

This block concludes the introduction of three-syllable words with affixes. For the first time, selected palatalizations are introduced, in both two- and three-syllable words. (The remaining minor palatalizations are listed in Section VII.) Palatalizations are certain spelling-to-sound correspondences which result in the sounds [š], [ž], [č], and [ǰ] and are discussed in greater detail in Cronnell (1971a, pp. 32-34). Words with palatalizations were coded "E" in Berdiansky et al. (1969). It is suggested that palatalizations

be taught by contrasting base and suffixed forms, e.g., promote-promotion, permit-permission, decide-decision. This will promote learning of English phonology, cf, MacDonald (1969), Chomsky (1970).

21,1: Three-syllable words with prefixes: un-, re-, dis-, in-, mis-

un- → [ən], e.g., unbroken

re- → [ri] or [rɪ], e.g., reopen

dis- → [dɪs], e.g., disappear

in- → [ɪn], e.g., inhuman

mis- → [mɪs], e.g., misbehave

21,2: -tion → [šən], e.g., vacation

This is the most common ending involving palatalization in the present lexicon. The suffix is generally only -ion (cf, -ssion and -sion, 21,3), but it is the t which is involved in palatalization, e.g., attract, attraction. (In some words -tion is a pseudo-suffix, e.g., nation.)

As when adding other suffixes beginning with a vowel, the final silent e on a base word is dropped, e.g., translate, translation. For certain base forms, the ending is -ation [éšən], e.g., tempt, temptation. Note that whenever -(t)ion is added to a word, stress is on the syllable preceding the suffix, e.g., dónate, donátion.

In the environment /s__, -tion is pronounced [čən], e.g., suggestion. This is an automatic phonological alternation.

A number of changes may occur in the base when -(t)ion is added. Those found in the present unit are listed below.

A. A long vowel in the base word becomes a short vowel in the suffixed word, sometimes with attendant consonant changes.

1. ai → [e] → e [ɛ] + tion, e.g., detain, detention

2. eive [iv] → ep [ɛp] + tion, e.g., receive, reception

3. ibe [ayb] → ip [ɪp] + tion, e.g., describe, description

4. u [u] → u [ə] + tion, e.g., reduce, reduction (The pronunciation of c changes from [s] to [k]--Rule C11 to C12--because of the change in environment.)

B. Other changes

1. <u>d</u> → <u>t</u> /__ion, e.g., <u>intend</u>, <u>intention</u>

2. <u>oi/oy</u> [oy] → <u>u</u> [ə] + <u>ction</u>, e.g., <u>destroy</u>, <u>destruction</u>

21,3: -<u>sion</u> → [šən], e.g., <u>mission</u>, <u>mansion</u>

-<u>sion</u> → [žən], e.g., <u>occasion</u>

The ending -<u>sion</u> has two pronunciations, depending on environment: [šən] and [žən] (cf, the contrast of [s] and [z] in Rules S10 and S20). While -<u>sion</u> is sometimes a pseudo-suffix, e.g., <u>mansion</u>, it generally results from the suffix -<u>ion</u>, e.g., <u>confession</u> (cf, -<u>tion</u>, 21,2). All words in this unit are stressed on the syllable preceding -(s)sion.

All occurences of -<u>ssion</u> are pronounced [šən]. This ending comes from three sources in the present lexicon:

1. base word ending in <u>ss</u> + <u>ion</u>, e.g., <u>discuss</u>, <u>discussion</u>;

2. base word ending in <u>t</u> + <u>ion</u> → <u>ssion</u>, e.g., <u>permit</u>, <u>permission</u>;

3. base word ending in <u>ede</u> [id] + <u>ion</u> → <u>ession</u> [ɛ̌šən], e.g., <u>procede</u>, <u>procession</u> (cf, -<u>ive</u>, 19,1).

The ending -<u>sion</u> is pronounced [šən] in the environment /C__, where the consonant is not <u>r</u>, e.g., <u>tension</u>. The pronunciation [žən] for -<u>sion</u> occurs in the environment /V__, e.g., <u>occasion</u>, and in the environment /r__, e.g., <u>excursion</u>. In addition, this pronunciation results from suffixation:

1. <u>Vde</u> [V̄d] + <u>ion</u> → <u>Vsion</u> [V̄zən], e.g., <u>conclude</u>, <u>conclusion</u>;

2. <u>ide</u> [ayd] + <u>ion</u> → <u>ision</u> [ɪžən], e.g., <u>divide</u>, <u>division</u>

21,4: -<u>ture</u> → [čər], e.g., <u>picture</u>

In the present lexicon, this is the second most frequent ending involving palatalization. Most generally, -<u>ture</u> is a pseudo-suffix, e.g., <u>future</u>, although the regular affix -<u>(t)ure</u> is occasionally found, e.g., <u>moisture</u>, <u>mixture</u>. Rule EA11, <u>ea</u> → [I], occurs in the environment /__ture.

<u>Block 22: Frequency = 334</u> (Non-affixed three-syllable words)

Unit 1: Stress pattern 3B   Frequency = 93

Unit 2: Stress pattern 3A   Frequency = 130

Unit 3:   Stress Pattern 3C   Frequency = 91

Unit 4:   Stress pattern 3D   Frequency = 20

Block 22 introduces nonaffixed three-syllable words.   Since no
new correspondences are used and since the concept of three syllables
has been employed previously (17,1; 17,3; 19,1; 20,1; Block 21), what
is primarily introduced in this block is new stress patterns.   These
are important because of their effect on the pronunciation of vowels:
vowels in unstressed syllables are pronounced using general primary
vowel Rule 17 ([ə], or in the case of y, Rule Y17: [i]), while vowels
in stressed syllables are pronounced employing other correspondences.
For describing stress, the following symbols are used:

    ': primary stress: full pronunciation of the vowel;

    `: secondary stress: full pronunciation of the vowel, but with
       less prominence than for primary stress;

    -: unstressed: [ə] (or [ɪ]) as the pronunciation of a, e, i, o,
       u; [i] as the pronunciation of y.

The difference between primary and secondary stressed vowels is probably
not of importance for teaching, so long as they receive their full
pronunciation.   The main concern is that unstressed vowels should not
receive a full pronunciation, but should be pronounced [ə] (or [i] for
unstressed y).

Note should be made here that the precise pronunciation of unstressed
vowels varies from dialect to dialect, from speaker to speaker, and
from word to word. While [ə] is the most common unstressed-vowel
sound, [ɪ] and other varieties of vowels may be used. In some words,
the pronunciation of unstressed u varies between [ə] and [(y)u],
often being pronounced [yə], e.g., formula. With stress pattern 3C,
the first vowel in some words may have its full pronunciation,
e.g., antenna.

Four stress patterns have been found which are applicable to the
three-syllable words in the present lexicon:

     22,2:   Stress pattern 3A: '--, e.g., carnival

     22,1:   Stress pattern 3B: '-`, e.g., hurricane

     22,3:   Stress pattern 3C: -'-, e.g., umbrella

     22,4:   Stress pattern 3D: `-', e.g., kangaroo

Stress patterns 3A and 3B are closely related, the difference being
that in 3A the final vowel is unstressed, while in 3B the final vowel

has its full form. It may be preferable to consider these patterns as subcategories of one overriding pattern. (Certain words belong to either stress pattern 3A or 3B, depending on form class; e.g., _estimate_ as a verb is 3B [έstəmèt], as a noun 3A [έstəmɪt].) In sequencing three-syllable stress patterns, 3B has been placed before 3A because both the first and last vowels of 3B can be pronounced using major environmentally governed correspondences. It is felt that the two unstressed vowels of 3A will be more difficult than the one of 3B. Otherwise, the criterion for sequencing stress patterns is frequency. Within each unit, stress patterns are ordered on the basis of the spelling-to-sound correspondences for the last vowel.

Fourth Year: Frequency = 1-148

(Low-frequency primary and secondary vowels; Four-syllable words;
Affixes; Four-syllable stress patterns)

REVIEW BLOCK

It is assumed that Fourth Year will begin with review. However,
no specific suggestions are made in this report. Since there are over
3000 exemplars given for Third Year, there should be sufficient
material for review.

Block 23: Frequency = 153 (Specific primary vowel rules)

Unit 1: A29 (29), A24 (44)	Frequency = 73
Unit 2: I35 (22), I25 (27)	Frequency = 49
Unit 3: Y11 (8), Y13 (6), Y15 (7), Y16 (10)	Frequency = 31

Blocks 23, 24, and 25 introduce the remaining, minor correspondences
for primary vowels (with the exception of general primary vowel Rule 32
in 27,6). In general, specific vowel rules are introduced in Block 23,
while Blocks 24 and 25 cover rules generalizable across all vowels
(general primary vowel rules).

23,1: A29: $a \rightarrow [e]$ $/\_\_\{^{nge}_{ste\#}\}$, e.g., <u>danger</u>, <u>paste</u>

A24: $a \rightarrow [a]$ $/ \{^{w}_{qu}\}\_\_$, e.g., <u>wad</u>, <u>squat</u>

This unit includes special rules for the letter <u>a</u>.

A29: This is a limited extension of Rule A11. Rule A29
applies even if the <u>e</u> is lost from the environment when suffixes
are added, e.g., <u>haste</u>, <u>hasty</u>.

A24: This rule applies only when the following consonant
sound is not a velar (i.e., is not [k, g, ŋ]); thus it does apply
before <u>k</u>, <u>ng</u>, <u>x</u>, <u>c</u> pronounced [k], or <u>g</u> pronounced [g]. It also
does not apply before <u>r</u>, where Rule A25 (9,3) is used. There is a
considerable amount of dialect and idiolect variation among exemplars
of this rule, with [ɔ] often being used.

23,2: I35: $i \rightarrow [i]$, e.g., <u>police</u>

I25: $i \rightarrow [y]$ $/C\_\_V_{unstressed}$, e.g., <u>junior</u>

This unit includes special rules for the letter i.

I35: This exception rule covers words which were coded as irregular in Berdiansky et al. (1969). It is unpredictable except in the environment /__#, where it always holds, e.g., ski (with the exception of I and hi).

I25: In this rule, i functions unpredictably as a consonant. The most common environment is /{l}__, e.g., million, onion.
$\quad$ (n)

23,3: Y11: y → [ay] /__Ce#, e.g., type

Y13: y → [ay] /__CV, e.g., tyrant

Y15: y → [ɪ] /__C(C)#, e.g., gym, myth

Y16: y → [ɪ] /__CC..., e.g., system

General primary vowel Rules 11-16 are applicable to y, where the pronunciation is the same as for i. Because of low frequency, the y rules have been postponed until this unit.

Block 24: Frequency = 224 (Four-syllable words; Rules for exceptions to general primary vowel Rule 13)

Unit 1: Four-syllable compounds (11); Four-syllable compounds with suffixes:
-ing (7), -y (1), -er (6), -or (8),
-ed (2), -ly (14) $\qquad$ Frequency = 50

Unit 2: E38 (38), I38 (22), A38 (21), O38 (8) $\qquad$ Frequency = 89

Unit 3: A28 (19), I28 (17), Y28 (1), O28 (21),
E28 (9) $\qquad$ Frequency = 67

Unit 4: General primary vowel Rule 27 $\qquad$ Frequency = 18

Block 24 marks the introduction of four-syllable words. In addition, rules are introduced which provide for exceptions to general primary vowel Rule 13; i.e., rules which provide for V → [V̌] /__CV (cf, 18,1).

24,1: Four-syllable compounds

Four-syllable words with suffixes: -ing, -y, -er, -or, -ed, -ly

This unit begins the introduction of four-syllable words, which continues in the first unit of each block until Block 27, where they are thoroughly introduced. The sequence and method of

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introducing four-syllable words is similar to that used for three-syllable words in Third Year. (See 17,2 and 17,3 for comments on suffixes.)

24,2: E38: $\underline{e} \rightarrow$ [ɛ] $/\_\{^x_v\}V$, e.g., $\underline{Texas}$, $\underline{level}$

I38: $\underline{i} \rightarrow$ [ɪ] $/\_vV$, e.g., $\underline{river}$

A38: $\underline{a} \rightarrow$ [æ] $/\_\{^{x(1)}_v\}V$, e.g., $\underline{axis}$, $\underline{axle}$, $\underline{cavern}$

O38: $\underline{o} \rightarrow$ [a] $/\_\{^x_v\}V$, e.g., $\underline{oxen}$, $\underline{novel}$

General primary vowel exception Rule 38 is as follows: $V \rightarrow [\breve{V}]$ $/\_\{^x_v\}(1)V$; it does not apply to $\underline{u}$ or $\underline{y}$ for any words in the present lexicon, nor are there exemplars of $\underline{i}$ in the environment $/\_xV$. The environment including $\underline{1}$ appears only in one word, $\underline{axle}$. The rule always works for $\underline{x}$, which can never be doubled and which functions as a consonant cluster (the CC in general primary vowel Rule 16, which always applies to primary vowels before $\underline{x}$). For vowels before $\underline{v}$, there is considerable variation between Rules 13 and 38 (cf, $\underline{evil}$, $\underline{devil}$), and it may be advisable to eliminate this rule for $\underline{v}$. (Exemplars with $\underline{v}$ could be taught as exceptions to Rule 13; see 18,1.)

24,3: A28: $\underline{a} \rightarrow$ [æ] $/\_C\begin{Bmatrix} ic \\ id \\ ish \\ it \end{Bmatrix}$, e.g., $\underline{magic}$, $\underline{rapid}$, $\underline{radish}$, $\underline{habit}$

I28: $\underline{i} \rightarrow$ [ɪ] $/\_C\begin{Bmatrix} ic \\ id \\ ish \\ it \end{Bmatrix}$, e.g., $\underline{clinic}$, $\underline{timid}$, $\underline{finish}$, $\underline{limit}$

Y28: $\underline{y} \rightarrow$ [ɪ] $/\_Cic$, e.g., $\underline{physic}$

O28: $\underline{o} \rightarrow$ [a] $/\_C\begin{Bmatrix} ic \\ id \\ ish \\ it \end{Bmatrix}$, e.g., $\underline{phonics}$, $\underline{solid}$, $\underline{abolish}$, $\underline{profit}$

E28: $\underline{e} \rightarrow$ [ɛ] $/\_C\begin{Bmatrix} ic \\ ish \\ it \end{Bmatrix}$, e.g., $\underline{relic}$, $\underline{cherish}$, $\underline{credit}$

General Primary vowel Rule 28 is as follows: $V \rightarrow [\breve{V}]$ $/\_C\begin{Bmatrix} ic \\ id \\ ish \\ it \end{Bmatrix}$.

This rule does not generally apply to $\underline{u}$. The endings $\underline{id}$, $\underline{ish}$, and $\underline{it}$ are not suffixes, but $\underline{ic}$ may be and in such cases the base and affixed forms should be contrasted in order to promote learning of English

phonology (cf, MacDonald, 1969; Chomsky, 1970). Stress is always on the syllable before the ending, even when the base form is stressed otherwise (e.g., áthlete, athlétic).

An alternative approach to the above sequence is teaching each letter in each environment, i.e.:

$$V \rightarrow [\breve{V}] \ /\_\_Cic,$$

$$V \rightarrow [\breve{V}] \ /\_\_Cit,$$

$$V \rightarrow [\breve{V}] \ /\_\_Cish,$$

$$V \rightarrow [\breve{V}] \ /\_\_Cid.$$

Y28: The only lexicon exemplars of Rule Y28 are in the environment /__Cic.

E28: There are no lexicon exemplars of Rule E28 in the environment /__Cid.

24,4: General primary vowel Rule 27

General primary vowel Rule 27 is as follows: $V \rightarrow [\breve{V}]\_\_$ City, e.g., humanity, ability. Rule 27 could be included in general primary vowel Rule 28 (24,3), but is not, however, since its occurrence involves four-syllable words. In addition, most exemplars of Rule 28 are cases of base plus -ity ($\rightarrow$ [əti]), and it is probably appropriate to teach this rule in terms of contrast between the base and suffixed forms to promote learning of English phonology (cf, MacDonald, 1969; Chomsky, 1970). Note that the last vowel in most base forms is unstressed ([ə] or [ɪ]), changing to [V̆] when the suffix is added. As with Rule 28, the syllable before the ending (-ity) is stressed, e.g., moral [mórəl], mórality [morǽləti]. Because of the limited number of exemplars, this rule is not taught by individual letters, but is generalized across letters.

Block 25: Frequency = 248 (Remaining general primary vowel rules)

Unit 1:	Four-syllable words with -tion	Frequency = 62
Unit 2:	I26 (30), Y26 (2), U26 (12), E26 (15), O26 (4), A26 (2)	Frequency = 65
Unit 3:	I36 (38), Y36 (2)	Frequency = 40
Unit 4:	A12 (18), I12 (9), Y12 (2), O12 (2), U12 (2)	Frequency = 33
Unit 5:	E14 (20), I14 (9), Y14 (4), A14 (8), O14 (4), U14 (3)	Frequency = 48

25,1 continues the introduction of four-syllable words. Units 2-5 of Block 25 mainly introduce new rules for the long pronunciation of primary vowels. Units 2 and 3 are concerned with the pronunciation of a vowel followed by a vowel, while units 4 and 5 are extensions of the long-vowel rules.

25,1: Four-syllable words with -tion → [šən]

Comments applicable to -tion are found in 21,2. It should be noted that primary stress always falls on the syllable before -tion; however, for four-syllable words there is secondary stress on the first syllable. Thus the stress pattern is '-'-, with unstressed vowels in the second and last syllables. These stress considerations may cause sizable pronunciation differences between base and suffixed forms (e.g., console [kənsól], consolation [kànsəléšən]), which should be contrasted when teaching palatalizations.

Within this unit there are two cases of exceptions to general primary vowel Rule 13:

a. the ending -ition pronounced [fšən];

b. the first vowel having a long sound in the base, but a short sound in the suffixed form, e.g., recite, recitation.

25,2: I26: i → [ay] /__-V, e.g., lion

Y26: y → [ay] /__-V, e.g., hyena

U26: u → [(y)u] /__-V, e.g., duet

E26: e → [i] /__-V, e.g., create

O26: o → [o] /__-V, e.g., poet

A26: a → [e] /__-V, e.g., mosaic

This unit introduces general primary vowel Rule 26: V → [V̌] /__-V. The hyphen indicates syllable division, to differentiate two separate vowels from a secondary vowel. In many cases where this rule applies, there is no possibility of confusion with secondary vowels; e.g., the sequence io is never a secondary vowel and must always be treated as two primary vowels, as in riot. However, in some cases a vowel sequence may be either a secondary vowel or two primary vowels, cf, the ea in sea [i] and area [iə]. In such cases, there is no way to determine which is the correct interpretation except by trial and error.

The vowel following a Rule 26, in most words, is unstressed [ə], e.g., riot [ráyət], area [ériə].

I26: This rule should be compared with Rule I25, where the i is pronounced [y], e.g., million.

Y26: This rule is another case of the applicability of general primary vowel rules to y, which has the same pronunciation as i.

25,3: I36: i → [ɪ] /__-V, e.g., Indian

Y36: y → [ɪ] /__-V, e.g., embryo

These exception rules have the same environment as Rules I26 and Y26, but a different pronunciation, [ɪ].

I36: Cf, Rule I35 (23,2) which has the same pronunciation.

25,4: A12: a → [e] /__C${r \atop 1}$e#, e.g., acre, table

I12: i → [ay] /__Cle#, e.g., title

Y12: y → [ay] /__Cle#, e.g., cycle

O12: o → [o] /__C${r \atop 1}$e#, e.g., ogre, noble

U12: u → [(y)u] /__Cle#, e.g., bugle

This unit introduces general primary vowel Rule 12: V → [V̄] /__C${r \atop 1}$e#, which is an extension of Rule 11 (Block 6), with r or 1 between the consonant and the final e. The environment /__Cre# occurs only if the consonant is g or c, when er would indicate the G11 or C11 pronunciations rather than the desired G12 or C12. The only examples of this in the present lexicon are acre and ogre, where re is pronounced [ər] and is thus irregularly-spelled (see Section V). General primary vowel Rule 12 apparently has no exemplars with e.

25,5: E14: e → [ɪ] /__C${r \atop 1}$V, e.g., secret, reflect

I14: i → [ay] /__C${r \atop 1}$V, e.g., library, biplane

Y14: y → [ay] /__C${r \atop 1}$V, e.g., hydrant, cyclone

A14: a → [e] /__CrV, e.g., April

O14: o → [ʌ] /__C${r \atop 1}$V, e.g., okra, only

U14: u → [(y)u] /__C${r \atop 1}$V, e.g., lubricate, duplicate

This unit introduces general primary vowel Rule 14: V → [V̄] /__C${r \atop 1}$V, which is an extension of Rule 13 (18,1) and is similar to Rule 12 (23,4).

E14: In unstressed syllables, this may be pronounced [ɪ] or [ə].

A14: There are no lexicon exemplars of this rule in the environment /__C1V.

Block 26: Frequency = 316 (Low-frequency secondary vowel rules)

Unit 1: Four-syllable words with suffixes: -able (19), -ment (5), -al (8), -ness (2), -ary (2), -ist (1)	Frequency = 37
Unit 2: IE17 (13), EY17 (23)	Frequency = 36
Unit 3: AI17	Frequency = 10
Unit 4: EA33	Frequency = 18
Unit 5: IE12 (39), EI10 (15)	Frequency = 54
Unit 6: EY10 (9), EI20 (19)	Frequency = 28
Unit 7: -ous (39), OU31 (27), OU35 (29), OU33 (19), OU34 (11)	Frequency = 125
Unit 8: UI31	Frequency = 8

This block continues the introduction of four-syllable words and concludes the teaching of secondary vowel rules.

26,1: Four-syllable words with suffixes: -able, -ment, -al, -ness, -ary, -ist

See 19,1 and 20,1 for discussion of these suffixes.

26,2: IE17: ie → [i] /__# in unstressed syllables, e.g., hippie

EY17: ey → [i] /__# in unstressed syllables, e.g., honey

Both rules in this unit occur in unstressed syllables in word-final position. Both are pronounced the same: [i] (or [ɪ], particularly in connected speech). Both, but especially IE17, are common in proper names (see Section VI).

IE17: For stressed final ie see Rule IE11 (19,2). Medial ie is covered by Rule IE12 (26,5).

EY17: Stressed ey is covered by Rule EY10 (26,6).

26,3: AI17: ai → [ə] in unstressed syllables, e.g., villain

All exemplars of this rule are in the environment /__n#. As with general primary vowel Rule 17, pronunciation varies between

[ə] and [ɪ]. In many cases, a vowel is not pronounced, leaving a syllabic [n̩], e.g., <u>mountain</u> [máwntn̩].

26,4: EA33: <u>ea</u> → [ə] /__r, e.g., <u>earn</u>

This is an exception rule, in that Rules EA11 and EA31 (12,2) are regularly found before <u>r</u>, e.g., <u>hear</u>, <u>bear</u>. Rule EA33 groups together all cases of <u>ear</u> pronounced [ər], e.g., <u>heard</u>

26,5: IE12: <u>ie</u> → [i̥] /C__C, e.g., <u>field</u>

   EI10: <u>ei</u> → [i̥], e.g., <u>seize</u>

Both rules have the same pronunciation, [i̥], and occur only medially.

   IE12: Final <u>ie</u> is covered by Rules IE11 (19,2) and IE17 (26,2). In addition, the sequence <u>ie</u> may be a combination of <u>i</u> and <u>e</u>, e.g., <u>diet</u> (see Rule I26 in 25,2).

   EI10: The other pronunciation of <u>ei</u> is covered by Rule EI20 (26,6) with which EI10 could be contrasted.

26,6: EY10: <u>ey</u> → [e], e.g., <u>they</u>

   EI20: <u>ei</u> → [e]/__ { gh, gn, n }, e.g., <u>weigh</u>, <u>reign</u>, <u>vein</u>

These two rules have the same pronunciation, and are in complementary distribution, EY10 occurring finally and EI20 occurring initially and medially.

   EY10: This rule applies in stressed syllables, primarily in one-syllable words. Unstressed <u>ey</u> is covered by Rule EY17 (26,2). The only exceptions to this rule are <u>key</u> and <u>eye</u> and their derivatives.

   EI20: For words with Rule EI20 in the environment /__gh, the <u>gh</u> is always silent (GH10, in 19,2). The environment /__n does not necessarily specify this rule, cf, <u>protein</u>, EI10 (26,5).

26,7: <u>-ous</u> → [əs], e.g., <u>dangerous</u>

   OU31: <u>ou</u> → [ə], e.g., <u>touch</u>

   OU35: <u>ou</u> → [d], e.g., <u>though</u>

   OU33: <u>ou</u> → [u], e.g., <u>soup</u>

   OU34: <u>ou</u> → [ɔ] /__ght, e.g., <u>fought</u>

This unit introduces the many remaining pronunciations of <u>ou</u>, the major one, OU10, having already been taught (16,2). Rule OU31

governs the pronunciation of the -ous ending, which is presented first because of its high frequency and consistency. Burmeister (1968) found OU31 to be the most frequent rule for ou in a 20,000 word corpus, due primarily to this ending.

-ous: The ending -ous is both a suffix and a pseudo-suffix, e.g., joyous, jealous.

OU31: The sequence our is pronounced [ər], e.g., courage.

OU35: All but one of the exemplars of this exception rule are in the environments /__gh, r, l.

OU33: The pronunciation [yu] seems not to occur for this rule, except variably in coupon.

OU34: All exemplars of this exception rule occur only in the environment /__ght. The gh is silent (Rule GH10) and ought could be taught as a sequence pronounced [ɔt]. In some dialects [a] is the pronunciation for this rule.

26,8: UI31: ui →[ɪ], e.g., built

All exceptions to Rule UI10 (16,6) are covered by this rule. The words are either build and its derivatives, or cases of unstressed ui, e.g., biscuit.

Block 27:   Frequency = 207 (Four-syllable words; General primary vowel Rule 32)

Unit 1:   Four-syllable words with prefixes:
          un- (8), in- (6), dis- (3), mis- (2)   Frequency = 19

Unit 2:   Stress pattern 4A (61), Stress pattern
          4B (10)   Frequency = 71

Unit 3:   Stress pattern 4C   Frequency = 23

Unit 4:   Stress pattern 4D   Frequency = 14

Unit 5:   Other four-syllable words   Frequency = 7

Unit 6:   E32 (51), O32 (13), A32 (6), I32 (3)   Frequency = 73

Block 27 concludes the introduction of four-syllable words and introduces general primary vowel Rule 32.

27,1:   Four-syllable words with prefixes: un-, in-, dis-, mis-,

See 21,1 for discussion of these prefixes.

27,2; 27,3; 27,4; 27,5: Four-syllable words

These units introduce nonaffixed four-syllable words. Since
no new correspondences are used and since the concept of four
syllables has been employed previously (24,1; 24,4; 25,1; 26,1;
27,1), what is primarily introduced in this block is new stress
patterns. See Block 22 for discussion of stress, stress symbols,
and unstressed vowels and their pronunciation.

Four stress patterns have been identified which are applicable
to the four-syllable words in the present lexicon:

27,2: Stress pattern 4A: -'--, e.g., <u>asparagus</u>

    Stress pattern 4B: -'-`, e.g., <u>abbreviate</u>

Stress pattern 4A and 4B are closely related, the difference
being that in 4A the final vowel is unstressed, while in 4B the final
vowel has its full form. It may be preferable to consider these
patterns as subclasses of one overriding pattern.

27,3: Stress pattern 4C: `-'-, e.g., <u>tonsilitis</u>

27,4: Stress pattern 4D: '-`-, e.g., <u>alligator</u>

27,5: Other four-syllable words

This is a small set of words with miscellaneous stress patterns:

    '---, e.g., <u>accuracy</u>

    '-`, e.g., <u>meteorite</u>

    `--', e.g., <u>marionette</u>

27,6: E32: <u>e</u> → Ø, e.g., <u>difference</u>

    O32: <u>o</u> → Ø, e.g., <u>history</u>

    A32: <u>a</u> → Ø, e.g., <u>separate</u> (Aj)

    I32: <u>i</u> → Ø, e.g., <u>aspirin</u>

There are a number of words where a graphemic medial vowel is
not generally pronounced (V → Ø), although an alternate pronunciation
with the vowel (unstressed, pronounced [ə]) is usually possible, if
over-precise. These unpronounced vowels are coded as general primary
vowel Rule 32. Very often they are in the environment /__r, e.g.,
<u>every</u>. In some instances, alternate pronunciations [Ø] and [ə] occur
depending on form class (cf <u>deliberate</u>, <u>elaborate</u>, and <u>separate</u> as
adjectives versus verbs). In such cases, Rule 32 applies to the

adjective forms and Rule 17 to the verb forms.

This unit includes potential three-syllable words reduced to two syllables and potential four-syllable words reduced to three syllables. There are no exemplars of general primary vowel Rule 32 for u or y.

E32: Many of the exemplars of Rule E32 have unpronounced e in the ending -ery (→ [ri]), e.g., scenery. Very often this results when -y is added to a base ending in -er, silver [sílvər], silvery [sílvri].

Section III

CRITERIA FOR WITHIN-RULE SEQUENCING

The general criteria for within-rule sequencing are described in Section I of this report. The present section details the specific criteria used in the word lists in Section IV, where exemplars of each rule are divided into a number of sections. Each section is indicated by a number or a letter or by a combination of number and letter, which ranks the exemplars (lowest number and first letter with highest priority) for predicted ease of presentation and learning of a rule.

In this report, several general criteria have been most commonly used for ranking exemplars:

1) Position of grapheme unit: initial, final, medial, in that order of difficulty;

2) Number of syllables: more syllables mean greater difficulty;

3) Frequency: a more frequent environment offers more exemplars for presentation;

4) Where applicable, rule exemplars within a section can be further subgrouped in the following order of descending preference:

    a. exemplars containing single consonants,
    b. exemplars containing double consonants,
    c. exemplars containing digraphs (e.g., sh, ch, etc.),
    d. exemplars containing consonant clusters;

5) Where applicable, rule exemplars within a section can also be further subgrouped in the following order of descending preference:

    a. exemplars containing short vowels,
    b. exemplars containing long vowels,
    c. exemplars containing consonant clusters;

When there is no criterion for division, or when the number of exemplars is low, words have been alphabetized. Within each section, words are also alphabetized.

In addition, three specific sets of criteria have been used with rules throughout the sequence: "general position criteria," "special position criteria," and "R criteria."

GENERAL POSITION CRITERIA

The "general position criteria" are given below, with the under-lined C or V as the grapheme unit being taught.

Consonants (one-syllable words):

1a = CV	2a = VC	3a = CVCC	4a = CCV(C)	5a = CCV(C)
1b = CVC	2a = CVC	3b = CCVC	4b = (C)VCC	5b = (C)VCC
			4c = CCVCC	5c = CCVCC
			4d = CCVCC	5d = CCVCC
				5e = CCCV.. or ..VCCC

Vowels (one-syllable words):

1a = V	2a = CV	3a = VCC	4a = CVCC	5a = CCVCC
1b = VC	2b = CVC	3b = CCV	4b = CCVC	5b = CCCV.. or ..VCCC

Consonants and vowels (multisyllable words):

6a = two-syllable compounds
6b = two-syllable words formed by adding affixes to one-syllable
    words

7 = two-syllable words
   a = grapheme unit initial
   b = grapheme unit final
   c = grapheme unit medial

8a = three-syllable compounds
8b = three-syllable words formed by adding affixes to two-syllable
    words

9 = three-syllable words
   a = grapheme unit initial
   b = grapheme unit final
   c = grampheme unit medial

10a = four-syllable compounds
10b = four-syllable words formed by adding affixes to three-
    syllable words

When the "general position criteria" are used, final silent e is treated as a C unless otherwise noted, since the criteria do not provide for two vowels in a word. When all words involved have a final silent e (e.g., in Block 6), it is excluded, since it does not differentiate words.

In the "general position criteria" and in other within-rule sequencing criteria, double consonants and consonant digraphs are counted as single C's; e.g., mat, mass, and mash are all considered to be CVC words. Also, secondary vowels are counted single V's; e.g., bet, beat, and beet are considered to be CVC words.

SPECIAL POSITION CRITERIA

The "special position criteria" are a modification of the "general position criteria" for vowels, with criteria collapsed, used in a few cases:

    i   = #(C)V...
    ii = #(C)CCV...
    iii = two-syllable compounds;
          two-syllable words formed by adding affixes to one-syllable
          words
    iv = other two-syllable words

R CRITERIA

The "R criteria" are used in addition to other criteria for vowels before r, because of the greater difficulty of Vr sequences:

    i = vowel not in the environment /__r
    ii = vowel in the environment /__r

Criteria for Within-Rule Sequencing
of First- and Second-Year Word Lists[1]

Blocks 1-4	general position criteria[1]
Block 5	
5,1	alphabetical
5,5	general position criteria
Block 6	general position criteria, with final silent e excluded (e.g., name = CVC); R criteria
Block 7	
7,1	general position criteria, with final silent e excluded (e.g., face = CVC)
Block 8	
8,1	1 = vowel Rule 11 at end of compound
	2 = vowel Rule 11 in first part of compound
	3 = other
8,2	A16, I16
	U16, E16
	1 = /#
	2 = other
O16	1 = con-
	2 = other

[1] In 1,1 these criteria were modified because of the introduction of five rules at once:
1 = VC
2 = CVC
3 = (C)VCC

O17
1 = on#
2 = other (not /__r)
3 = or(C)#

10,2 Y17
1 = base + ly
2 = base + $\underline{y}$: a = $\left\{\begin{matrix} CC \\ VC \end{matrix}\right\}$ + $\underline{y}$; b = C + C$\underline{y}$
3 = numbers
4 = other: a = C$_1$C$_1$$\underline{y}$; b = $\left\{\begin{matrix} VC \\ C_1C_1 \end{matrix}\right\}$ $\underline{y}$

LE22
1 = C$_1$C$_1$ $\underline{le}$
2 = $\left\{\begin{matrix} VC \\ C_1C_2 \end{matrix}\right\}$ $\underline{le}$

10,3 alphabetical

10,4 I16
1 = $\underline{in}$-
2 = $\underline{dis}$-
3 = other

U16
1 = $\underline{un}$ + base
2 = other

A16, O16, E21, O21, EE10
alphabetical

10,5 A17
1 = $\underline{a}$ + base
2 = #$\underline{a}$
3 = other

E17
1 = $\underline{ex}$-
2 = #$\underline{e}$
3 = other

O17
1 = $\underline{con}$-
2 = $\underline{com}$- and $\underline{col}$-
3 = $\underline{pro}$-
4 = other (not /__r)
5 = #Cor

U17, I17 alphabetical

Block 11

11,1
1 = base + ing
2 = -ing#
3 = other

11,2 general position criteria

Block 9

9,1 general position criteria, with $\underline{r}$ as part of
the vowel (e.g., or = V)

9,2 E21
1 = base + er: a = $\left\{\begin{matrix} CC \\ VC \end{matrix}\right\}$ + er; b = C + Cer
2 = unstressed final er: a = $\left\{\begin{matrix} VCer \\ C_1C_2er \; 2 \end{matrix}\right\}$;
b = C$_1$C$_1$er
3 = #Cer
4 = secondary stressed er(C)#

U21,I21,
A21

O21
1 = compounds
2 = er#
3 = other

9,3 general position criteria, with $\underline{r}$ as part of
the vowel (e.g., word = CVC)

Block 10

10,1 I17
1 = ish#
2 = iC#
3 = iCC#

U17
1 = us#
2 = other

E17
1 = base + ness/less: a = -ness; b = -less
2 = base + en/ed: a = -en; b = -ed
3 = other ess, en, ed: a = ess; b = en; c = ed
4 = et#
5 = el#
6 = other

A17
1 = -man
2 = a#
3 = al#
4 = other (not /__r)
5 = ar (C)#: a = ar#; b = ar(C)#

---

[2] The notation C$_1$C$_2$ indicates two different consonant letters, while
C$_1$C$_1$ indicates two occurrences of the same letter.

11,3   general position criteria

11,4   general position criteria

11,5   GG10
1 = one-syllable words; compounds
2 = other two-syllable words

11,6   CC10
alphabetical
1 = one-syllable words
2 = nger
3 = other two-syllable words

Block 12

12,1   general position criteria

12,2   EA11[3]

general position criteria

1 = environments applying to EA11, but not to EA31: a = /__#; b = /__l; c = /__m; d = /__ch; e = /__p; f = other
2 = environments applying primarily to EA11, but also to EA31 (and/or EA33 and/or EA40): a = /__r; b = /__t; c = /__k; d = /__n; e = /__st;
3 = environments applying fairly equally to EA11 and EA31: a = /__d; b = /__f; c = /__v; d = /__th;
plus special position criteria

EA31
1 = /__lth (environment applying to EA31, but not to EA11)
3 = environments applying fairly equally to EA31 and EA11: a = /__d; b = /__r; c = other;
plus special position criteria

12,3   0011
1 = environments applying to 0011, but not to 0012: a = /__#; b = /__n; c = /__m; d = /__p; e = /__th; f = /__st;

2 = /__l (environment applying primarily to 0011, but also to 0012)
3 = environments applying fairly equally to 0011 and 0012: a = /__t; b = /__d; c = /__f; d = /__r; e = /__k;
plus special position criteria

0012
2 = /__k (environment applying primarily to 0012, but also to 0011)
3 = environments applying fairly equally to 0012 and 0011: a = /__d; b = /__t; c = /__l; d = /__f; e = /__p;
plus special position criteria

12,4   general position criteria

Block 13

13,1   031

general position criteria

1 = one-syllable words
2 = base + 'ful
3 = other two-syllable words

U31
1 = /__ll
2 = /__lt
3 = /__ld
plus special position criteria

13,2   A23
1 = /__ll
2 = /__ld
3 = /__lt
plus special position criteria

023
1 = /__nd
2 = /__ld
plus special position criteria

13,3   I22
1 = environments applying to 024, but not to any other rules for o: a = /__ng; b = /__g; c = /__ff; d = /__ft; e = /__nk;
3 = environments applying to 024 and also to other rules for o: a = /__ss; b = /__st; c = /__th;
plus special position criteria

024[4]

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[3] In both 12,2 and 12,3 (and similarly in 13,3; Rule 024) there are two rules for two different pronunciations of the same secondary vowel, and the following criteria are used:
1 = environments applying primarily to the rule under consideration, but not the other rule;
2 = environments applying primarily to the rule under consideration, but also to the other rule;
3 = environments applying fairly equally to both rules.

[4] See footnote 3.

Criteria for Within-Rule Sequencing of Third-Year Word List

Block 14

14,1
1 = dge (#): a = one-syllable words; b = compounds; c = two-syllable words;
2 = nCe#: a = nge#; b = nce#; c = nse#; i = one-syllable words; ii = two-syllable words
3 = lCe
4 = other: a = one-syllable words; b = two-syllable words

14,2
1 = rse#
2 = rve#
3 = rge#

14,3
1 = nce#
2 = Vge#
3 = Vce#
4 = other VCe#
5 = other VCCe#

Block 15

15,1 — alphabetical

15,2 — second-year sequence, alphabetical within units

Block 16

16,1 — general position criteria; R criteria

16,2 — general position criteria; R criteria

16,3 OE10 — 1 = one-syllable words; 2 = two-syllable words

OA10 — general position criteria; R criteria

16,4 — general position criteria

16,5 — general position criteria

16,6 UE10 — general position criteria

Ui10 — 1 = one-syllable words; 2 = compounds; 3 = two-syllable words

EW10 — general position criteria

Block 17

17,1 — alphabetical

17,2 -er — 1 = $V11^5$, C#+er
2 = other C#+er (C ≠ 1)
3 = 1# (LE22) + er
4 = y [ay] → i [ay] + er

-en — alphabetical

-ing — 1 = V11, C#+ing; 2 = other

-y — 1 = V11, C#+y; 2 = other

[5] V11 = general primary vowel Rule 11.

-s
1 = s → [z], [s]: a = one-syllable words;
b = compounds; c = two-syllable words;
d = f (singular) → v (plural)
2 = (e)s → əz
3 = y → i + es

-ed
1 = C+(C)ed: a = [d], [t]: i = one-syllable
words, ii = two-syllable words; b = [əj]
V+ted: a = [d], [t]: i = one-syllable
words, ii = two-syllable words; b = [əd]
3 = y → i + ed

17,3   -er
1 = two-syllable base + er: a = no change in
base; b =
2 = compounds: a = no change in base word;
b =

-en, ing, -ed
alphabetical

-ly
1 = no change in base
2 = y [i] → i [ə] + ly
3 = ful + ly

Block 18
18,1 |13
1 = re-
2 = be-
3 = de-
4 = e-
5 = pre-
6 = other two-syllable words
7. = three-syllable words

013
1 = o-
2 = pro-
3 = Co-
4 = CCo-
5 = three-syllable words

A13
1 = two-syllable words
2 = three-syllable words

I13
1 = i-
2 = Ci-
3 = CCi-
4 = three-syllable words

|13
1 = (C)u-
2 = CCu-
3 = three-syllable words
plus R criteria

18,2   S20
"general position criteria; final silent e
excluded (e.g., nose = CVC̥)

| S21
1 = -ouse: a = one-syllable words; b = two-
and three-syllable words
2 = -ase: a = one-syllable words; b = two-
and three-syllable words
3 = -ease
4 = -oose

18,3
1 = arV
2 = arrV
3 = other

18,4
1 = one-syllable words
2 = two-syllable words; first syllable
stressed with a vowel 13 rule
3 = two-syllable words; first syllable
stressed with other vowel rule
4 = two-syllable words; second syllable
stressed

Block 19
19,1   -ment
1 = base + ment
2 = other

-or
1 = no change in base
2 =

-ive
1 = no change in base.
2 = changes in base

-ness
1 = no change in base
2 = y → i [i] + ness

-ance/-ant
1 = no change in base
2 = changes in base
3 = other.

19,2   IE11
1 = one-syllable words
2 = two-syllable words

I124 + GH10 general position criteria, with gh as part of the vowel (i.e., igh = V)

GH10
1 = gh#
2 = ght#
3 = two- and three-syllable words

19,3   H20
1 = h → ∅ / #___
2 = h → ∅ /___#
3 = h → ∅ /___ unstressed

K20   general position criteria, with kn as a consonant (e.g., knit = CVC)

G20
1 = #gn
2 = gn#: a = ign (Rule 122); b = other

W20   general position criteria, with wr as a consonant (e.g., wring = CVC)

19,4

19,5   L20   general position criteria, with mb as a consonant (e.g., lamb = CVC)
1 = -alk (Rule A23):   a = one-syllable words; b = two-syllable words
2 = -olk (Rule 023)
3 = -alf
4 = -alv
5 = -alm

T20
1 = -stle
2 = -sten
3 = -ften

19,6
1 = one-syllable words
2 = two-syllable words

Block 20

20,1   -y
1 = no change in base
2 = ∅
3 = other

-ful   alphabetical

-al
1 = no change in base
2 = ∅

---

1 = no change in base
2 = ∅

-able

-eth, -less, -ish, -ist

general position criteria

20,2
1 = -ther: a = two-syllable words; b = three-syllable words

20,3
2 = -thern
3 = -the

20,4
1 = two-syllable words
2 = three-syllable words

Block 21

21,1   alphabetical

21,2
1 = two-syllable words
2 = three-syllable words, no changes: a = base + ion; b = other
3 = ∅ + ion
4 = base + ation: a = no change in base; b = ∅
5 = miscellaneous changes in base
6 = tion + al
7 = tion → [čǝn] /s___

21,3   -sion → [šǝn]
1 = -ssion: a = two-syllable words; b = three-syllable words: i = no change in base, ii = t + ion → ssion, iii = other
2 = -sion/C : a = two-syllable words; b = three-syllable words

-sion → [žǝn]
1 = /v___
2 = /r___
3 = de + ion → sion: a = v → [v̄] /___$\frac{de}{sion}$;
b = v → [v̄] /___de
→ [v̄] /___sion,

21,4
1 = two-syllable words
2 = three syllable words

Criteria for Within-Rule Sequencing of Fourth-Year Word List

Block 23

23,1 A29
1 = -aste#: a = base words; b = derived words and compounds
2 = -ange# (including derived forms)
3 = -ange...

A24
1 = #wa... (one-syllable words)
2 = #swa...(one-syllable words)
3 = #(s)wa (derived words and compounds)
4 = #(s)wa...(other two- and three-syllable words)
5 = #(s) qua...

23,2 I35
1 = /_#: a = one-syllable words; b = two- and three-syllable words
2 = -ine#
3 = other

I25
1 = -ion
2 = -ior
3 = -ia
4 = view
5 = other

23,3 alphabetical

Block 24

24,1 four-syllable compounds, -ing, -y, -er, -or, -ed alphabetical,

-ly
1 = base + ly
2 = ful + ly

24,2
1 = /_x: a = two-syllable words; b = three-syllable words
2 = /_v: a = one- and two-syllable words; b = three-syllable words; c = four-syllable words

24,3
1 = /_Cic: a = two-syllable words (plus affixes); b = three- and four-syllable words

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Block 23

22,1
1 = V11, Ce#: a = first vowel: vowel 16 rule; b = first vowel: other vowel rule
2 = V19# —
3 = V15,C(C)(e)#
4 = other

22,2
1 = V17#
2 = LE22#
3 = V17, 1#
4 = V17, r# or E21, r#
5 = AI7#
6 = V17, C#
7 = V17, CC#
8 = V17, C(C)e#

22,3
1 = AI7#
2 = V17, r# or E21, r#
3 = O25#
4 = V17, C(C)#
5 = V17, 1# or LE22#
6 = other

22,4
1 = EE10, (C)#
2 = other

24,4
2 = /___ Cit: a = two-syllable words (plus affixes); b = three-syllable words
3 = /___ Cish
4 = /___ Cid
1 = base + ify
2 = ∅
3 = other

Block 25

25,1
1 = base + ion: a = no change in base; b = ∅
2 = -ation: a = no change in base; b = ∅
3 = -ition [ɪʃən]
4 = miscellaneous changes
5 = first vowel: [V] in base → [Ṽ] in affixed form (with various changes)
6 = other

25,2   I26
1 = two-syllable words: a = Ci, b = CCi
2 = three-syllable words: a = compounds, affixed words; b = other

Y26   alphabetical

U26
1 = two-syllable words
2 = three-syllable words

E26, O26   ey
1 = two-syllable words
2 = three-syllable words

A26, O26   alphabetical

25,3   I36
1 = two-syllable words
2 = -io#
3 = -ium#
4 = other three-syllable words
5 = four-syllable words

Y36   alphabetical

25,4   A12
1 = two-syllable words
2 = three- and four-syllable words

I12, Y12, O12, U12   alphabetical

25,5   E14
1 = re-
2 = other

I14, Y14, A14, O14, U14   alphabetical

Block 26

26,1   -able
1 = no change
2 = ce: no change
3 = ∅
4 = y → i [ay]

alphabetical

-ment

-al
1 = no palatalizations
2 = palatalizations

-ness, -ist   alphabetical

26,2   IE17
1 = base + ie
2 = other

EY17

26,3   EY17
1 = base + ey
2 = other two-syllable words
3 = three- and four-syllable words

alphabetical

26,4

EY10   general position criteria, with r as part of V (i.e., ear = V)

26,5   EY10   general position criteria

26,6   EI20   general position criteria
1 = eigh# (one-syllable)
2 = eight# (one-syllable)
3 = other one-syllable words
4 = affixed forms and two- and three-syllable words –

26,7   -ous
1 = base + ous
2 = ∅
3 = y → i + ous
4 = er → r + ous
5 = non-base
6 = -ous ∄ suffix

OU31 general position criteria

OU35 general position criteria; R criteria

OU33 general position criteria; R criteria

OU34 general position criteria, with gh as part of V (i.e., ough = V)

26,8 general position criteria

032   1 = three-syllables → two-syllables: a = -ory#;
     b = other
   2 = four-syllables → three-syllables
   3 = five-syllables → four-syllables

A32, I32   1 = three-syllables → two syllables
   2 = four-syllables → three-syllables

Block 27

27,1 un- : 1 = -ed#
         2 = other

in-, mis-, dis- : alphabetical

27,2 Stress pattern 4A
1 = ia(C)(e)#: a = ia#; b = ial#; c = other
2 = {i, um#
     e...
3 = Vr(y)#: a = ior#; b = Vr#; c = Vry#
4 = Y17#
5 = -ence/-ent
6 = Vble#
7 = other

Stress pattern 4B
1 = -ate#
2 = other

27,3 1 = -ic#
     2 = other

27,4 1 = -ary
     2 = other

27,5 alphabetical

27,6 E32: 1 = three-syllables → two-syllables: a = -ery#;
       b = -erence/-erent; c = -ing#; d = other.
     2 = three-syllables → two-syllables + affix
     3 = four-syllables → three-syllables

Section IV

SEQUENCED WORD LISTS

First-Year Word List: Frequency = 797

Block 1: Frequency = 315

1,1 Frequency = 10

N10, NN10, T10, A15, I15   Frequency = 10

1	an	at	in	inn
2	tan	tat	tin	
3	ant	tint		

1,2 Frequency = 11

P10   Frequency = 11

1b	pan	pat	pin
2b	nap	nip	tap
3a	pant		
5b	apt		

1,3 Frequency = 40

L10   Frequency = 7

1b	lap	lip	lit
2b	pal		
3a	lint		
5a	plan		
5c	Plant		

LL10   Frequency = 3

| 2a | ill | till |
| 2b | pill | |

S10   Frequency = 27

| 1b | sap | sat | sin | sip |
| | sit | sill | | |

4a slap   slat   slip   slit   snap
    snip   span   spat   spill spin
    spit   still
    its   taps
4b slant
4c last   list   past
5b lisp
5e pants split

SS10   Frequency = 3

| 2a | ass | |
| 2b | lass | pass |

1,4 Frequency = 47

D10   Frequency = 14

1b	dad	did	din	dip
2b	lad	lid	dill	
3b	slid	pad	sad	
4b	and	land	sand	
4c	stand			

DD10   Frequency = 1

| 2b | add |

E15   Frequency = 32

2b	dell	den	led	less	let
	net	pen	pep	pet	sell
	set	tell	ten		
3a	end	lend	nest		
4a	dent	pest	nest	pelt	pent
	test	sent	tend	tent	
4b	sled	sped	spell	step	
5a	slept	spend	spent		

1,5 Frequency = 101

M10   Frequency = 32

1b	mad	man	map	mass	mat
	men	mess	met	mill	miss
	mitt				

(dr / br / tr blends)

label	words
5a	brad, bran, brass, brat, dress; drill, drip, drum, press, prim; trap, trill, trim, trip, trump; strap, strip, strum, strut
5c	brand, primp, print, tramp; trust
5e	strand
6a	rat-tat

H10 Frequency = 22

label	words
1b	had, ham, hat, hell, hem; hen, hid, hill, him, hip; hit, hub, hull, hum, hut
3a	hand, held, help, hemp, hint; hump, hunt

O15 Frequency = 39

label	words
1b	odd, on
2b	bob, lot, not, rod, top; doll, mob, pod, rot; dot, mom, pop, sob; hot, mop, pot, sod; hop, nod, rob, sop
4a	bond, pond, romp
4b	blot, drop, plod, slot, spot
5a	blond, slop
5e	prompt

plot, stop, prop, trot

Block 2: Frequency = 51

2,1 Frequency = 29

SH10 Frequency = 29

label	words
1b	sham, shed, shell, ship; shop, shot, shut, shi.
2a	ash, dish, hash, hush; lash
2b	dash, mash, mush, rush, sash
3a	shalt, blush, brush, hash, slush, smash
3b	blush, shred, shrill, shrub
4a	shrimp
4c	splash
5e	splash

trash

B10 Frequency = 28

label	words
2a	am
2b	dam, dim, tam
3a	mast, melt, mend
3b	slam, slim, stem
4b	elm
5a	smell, imp, lamp
5b	damp, limp
5c	smelt
5d	stamp
5e	midst
6a	tom-tom

U15 Frequency = 41

label	words
1b	bad, bass, bat; bell, bib, bid; bin, bit
2b	dab, tab
3a	band, belt, bend, bent
3b	slab, stab, bled, bless
4a	blab, bled, bliss
4c	blast, blend, blimp

1,6 Frequency = 106

label	words
1b	up, us, bus, but
2b	bud, bum, mud, num, muss
3a	butt, dull, pup, sub, sum; nut, pun, tub, sun, sup, ups
4a	bump, bust, dump, dust; lust, must, pump; lump, plus, spun, stub, slum
4b	plum, plump
5a	stun, stump, stunt
5e	plump, mumps

R10 Frequency = 45

label	words
1b	ram, rib, rum; ran, rid, run; rap, rim, rut; rat, rip; red, rub, runt
3a	rend, rest, rump; rust

2,2 Frequency = 22

TH13 Frequency = 6
1b	than	that	them	then	this
	thus				

TH11 Frequency = 16
1b	thin	thud	bath	math	lath
2b		pith	hath		
3a		thump	thresh		
4a		thrash	thrush		
4b		depth	thrill		
4c		thrust	tenth	thresh	

Block 3: Frequency = 51

3,1 Frequency = 40

FE10 Frequency = 36
1b	eel	see	tee	thee	deer
2a	bee	beet	deed	deep	peel
2b	beer	heel	meet	need	seed
	heed	peer	reed	reel	sheet
	peep	seen	seep	sheep	
	seem				
	teeth				
	three				
3b	tree				
4b	bleed	sleep	speed	steel	
	steep	steer			
5e	street				

E25 Frequency = 4
2a	be	he	me	she

3,2 Frequency = 11

Y19 Frequency = 11
2a	by	my	shy	thy	sty
3b	dry	pry	sly	spy	
	try				
6a	by-by				

Block 4: Frequency = 380

4,1 Frequency = 51

F10 Frequency = 51
1a	fee		fan	fat	fed	feed
1b	fad	feet	feel	fell	fib	fill
	fin	fish	fit	fun	fuss
	if				
2a					
2b	beef				
3a	fast	fond	felt	film	fist
4a	flap	flat	flash	flat	fled	flee
4b	fleet	flip	flesh	flop	fly
	free	fret	fresh	fry	
4b	elf	flint	self	film	fled
4c					
5b	left	lift	raft	shaft	shift
	sift	self	shelf		
5d	draft	drift	thrift		

FF10 Frequency = 9
2b	buff	huff	muff	puff	stuff
3b	fluff	sniff	staff	stiff	

W10 Frequency = 31
1a	we	wee	weed	weep	well
1b	web	wed	wit	wish	wit
	wet	will	with		
	with				
3a	went	wept	west	wilt	swill
5a	dwell	sweep	sweet	swell	twin
	swim	swish	tweed		
5c	swept	swift	twist	tweet	
5e	twelfth				

4,2 Frequency = .187

K10 Frequency = 37
1b	keen	keep	kid	kill	kin
	kiss	kit			
2b	leek	meek	meek	reek	seek
	week	peek			

3a kelp kept desk dusk
4b ask bask mask disk
elk husk task milk
silk sulk skill tusk risk
5a skid skim sink skip
skit skull sky skin

N20 Frequency = 34

5b bank bunk hunk ink
link mink pink punk
rink sank sink sunk
thank think wink tank
5d blank blink brink drink klink
drunk frank plank prank rank
shrunk skunk slink spank
trunk

G12 Frequency = 59

1b cab cad can rap cash
cat cob cod cop cot
cub cud cuff cup cuss
3a camp cast clan clap class
4a clad clam clip club crab
cliff clod creed creek creep
cram crash cred cry crab
crib crop crush craft cramp
4c clamp clasp clump crisp crust
crank crept crest
5a scab scat scant
5b act fact
5c scalp scamp
5d tract strict
5e scrap screen scrub

CK10 Frequency = 57

2b back beck buck cock deck
dock duck hack heck kick
lack lick lock luck neck
nick pack peck pick rack
rock sack sock shock shuck
sick sock suck tack thick
tick tuck wick

3b block brick black click clock
crack cluck flock cluck pluck
slack prick slick smack smock
stack speck stick stock struck
trick track truck
5e struck

4,3 Frequency = 65

G12 Frequency = 65

1b gap gas gash god
got gum gun dig
2b bag beg big bug keg
dug fig hag hug nag
lag leg lug mug rig
peg pig pug rag wag
rug sag tag tug
wig
3a gasp gulf gulp plug
3b crag drag drug twig
slag slug snag grab
4a glad glass gash grill
greed glen gruff
grass green
grin grit grub
4c grand grant grunt

4,4 Frequency = 32

J10 Frequency = 12

1b jack jam jell jet jig
job jot jug just
3a jest jump junk

X10 Frequency = 14

2a ax ox fox mix rex
2b box fix tax wax
3b six six sox
5b flax next sixth

Y10 Frequency = 6

1a ye yell yes yet
1b yak yap yes

Second-Year Word List: Frequency = 2313

Block 5: Frequency = 68

5,1 Frequency = 36

Compounds   Frequency = 36

bathtub	blacksmith	bobsled	cannot
catfish	catnip	chopstick	deerskin
fishpond	flagship	flashbulb	grandstand
gumdrop	hotbed	inkstand	inkwell
inland (P)	instep	lipstick	lockbox
milkman	milkweed	padlock	pickup
pigpen	sandbag	sandman	sheepman
shellfish	shotgun	sunset	teepee
tomcat	uphill	upset (N)	weekend

5,2   The -ing suffix with previously introduced base words,

5,3   The -es suffix (plurals and third-person singular, present tense forms) with previously introduced base words.

5,4   The -ed suffix (past tense) with previously introduced base words.

5,5   Frequency = 32

NG10   Frequency = 32

2b	bang	ding	fang	gang
	hang	hung	king	lung
	rang	ring	rung	sang
	sing	sung	thing	wing
3b	bring	clang	cling	fling-
	slang	sling	slung	sting
	stung	swing	swung	
5e	sprang	spring	sprung	string
	strung			

4,5 Frequency = 5

V10   Frequency = 2

1b van
3a vest

Z10   Frequency = 2

3a zinc
6a zig-zag

ZZ10   Frequency = 1

2b buzz

.88

Block b: Frequency = 869

6.1 Frequency = 177

A| Frequency = 109

1b|	ale	ape	ate		
2b|	babe	bade	bake		
	cake	came	came		
	cave	dame	date		
	fake	fame	tate		
	game	gate	gave		
	lake	lame	plate		
	made	make	mane		
	mate	name	pane		
	pave	rake	rave		
	safe	sake	same		
	sane	save	shade		
	shame	shape	shave		
	tale	tame	tape		
	wade	wake	vane		
			wave		
4b|	bare	care	dare	hire	mire	tire
	hare	mare	rare			
	share	ware				
4b|	blade	blame	blaze			
	brave	crane	crate			
	craze	drake	drape			
	flame	frame	glade			
	grape	grate	graze			
	plane	plate	scale			
	slate	slave	snake			
	spake	stake	stale			
	stave	trade				
4/5b|	glare	scare	snare			
	stare		spare			
5b	scrape					

I| Frequency = 68

2b|	bike	bite	dike	dime	hire	mire	tire
	dine	dive	fife	fife	crime	drive	glide
	five	hide	hike	hive	prize	shrine	slide
	kite	life	like	lime	smile	snipe	spike
	line	live (Aj)	mile	mine	spine	stile	swipe
	mite	nine	pile	pine	twine		
	pipe	ride	rime	ripe	stride	strike	stripe
	rite	shine	side	site			
	size	tide	tile	time			
	vine	wide	wife	wine			
	wipe						

2b| tire, wire, bride, pride, slime, spine, tribe
5b| sprite

OI| Frequency = 83

O| Frequency = 60

1b|	ore			
1b|	bone	code	coke	cone
	dole	dome	dope	dove (vb)
	hole	home	hope	joke
	hose	mode	mole	mope
	note	poke	pole	pope
	robe	rode	role	rope
	sole	sole	tone	vote
	wove	woke	yoke	zone
2b|	bore	core	fore	more
	shore	sore	tore	wore
4b|	broke	clove	drove	froze
	globe	grove	slope	smoke
	smote	spoke	stole	stone
	stove	throne		
4b|	score	snore	store	swore
5b|	stroke			

U| Frequency = 16

2b|	cube**	cute**	duke	dune
	June	mule**	rude*	rule*
	tube	tune		
2b|	cure**	pure**	plume*	
4b|	crude*	flute*		

E| Frequency = 3

1b|	eve	theme
2b|	here	

EE10 + E18   Frequency = 4

4b   breeze   freeze   sleeve   sneeze

* = always pronounced [u]
** = always pronounced [yu]
Unasterisked words may be pronounced either [u] or [yu], but [u] predominates.

Block 7: Frequency = 36

7,1 Frequency = 36

C11 Frequency = 26

1b	cell	ice	lice	
2a	ace	face	race	
2b	dice	nice	rice	
3a	cent	fleece	grace	place
3b	brace	slice	space	spice
	price	trace	twice	
	thrice			
5a	scene			
5e	spruce			

G11 Frequency = 10

1a	gee	
7b	gem	gin
2a	age	
2b	cage	huge
3b	stage	page
	rage	sage

7,2 The -s, -d, and -ing suffixes added to words with general primary vowel Rule 11.

Block 8: Frequency = 68

8,1 Frequency = 45

Compounds with rules in Block 5-7 Frequency = 45

1	bathrobe	beehive	campfire
	classmate	cupcake	drugstore	hillside
	inside	jumprope	keepsake	manhole
	milkshake	nickname	pancake	ragtime
	springtime	sunshine	tadpole	teenage
	upside	wishbone		
2	farewell	firefly	fireplace	fireside
	grapevine	herein	homemade	homesick
	icebox	iceman	limeade	limestone
	livestock	paleface	pipeline	polecat
	sagebrush	smokestack	sparerib	stovepipe
	tapeline			
3	gangplank	slingshot		

8,2 Frequency = 23

A16 Frequency = 6

		address (N)	(P)	annex (N)
1	abscess	sampan	transplant	(N)
2	landscape			

I16 Frequency = 3

1	index	insect
2	picnic	

U16 Frequency = 3

1	umpire	
2	muskrat	suspect (N)

E16 Frequency = 2

2	reptile	welfare

O16 Frequency = 9

	concrete (P)	(AS)	conduct (N)	content (N)
1	contest (N)	contract (N)		convent (N)
2	bonfire	compact (N)		costume

Block 9: Frequency = 323

9,1 Frequency = 107

A21 Frequency = 40

1b	ark	arm	art	jar
2a	bar	car	far	
	mar	tar		
2b	bard	bark	barn	card
	carp	cart	dark	darn
	dart	farm	hard	hark
	harm	harp	lard	lark
	mark	matsh	park	part
	shark	sharp	tart	yard
	yarn			
3b	scar	star		
4b	scarf	smart	spark	start

1b batter blotter clipper **0** cutter
dipper dropper drummer fibber
flapper gunner potter robber
runner shutter snapper stopper
swimmer thinner trapper winner
zipper

2a after amber antler aster
blister canter center cinder
cluster cracker enter feeder
filter flicker gander ginger
hinder huckster limber lobster
locker lumber master member
mister monster number pester
plaster pucker scamper scatter,
shelter silver sister slinder
slumber splinter sucker teeter
teeter-totter temper tender
thunder timber tinker under
winter yonder

2b banner better bitter bladder
blubber butter copper dinner
flutter fodder gutter hammer
holler inner ladder latter
letter litter manner matter
miller mutter otter patter
pepper pitter pitter-patter
platter rubber rudder setter
shatter skipper slipper spatter
summer supper tatter teller
twitter udder upper
3 ferment (N) perfume termite expert
4 adverb cistern concert transfer (N)
iceberg lantern pattern
western

U21   Frequency = 5
1 sandbur sunburn murmur
2 burdock murmur murder,

I21   Frequency = 4
1 birdseed blackbird, catbird redbird

O21   Frequency = 26
1a or
1a for nor worn
2b born cord fort
ford fork mosh
forth horn short
north pork worn
sort thorn
4b sport storm

U21   Frequency = 15
1b urn fur
2a hur hurn curb
2b turl turn hurt turl
3b spur
4a burnt burst
4b slurp

I21   Frequency = 14
1a fir sir
1b bird birth dirt
third
3b stir
4a first thirst
4b flirt skirt swirl twirl

E21   Frequency = 12
2a her per herd
2b berth fern germ verb
jerk pert term
4b clerk stern

9,2   Frequency = 193

E21   Frequency = 151   (plus agent noun and comparative adjective forms of previously introduced words)
1a banker bumper burner camper
dresser dweller flyer gusher
hanger helper herder hunter
jumper keeper milker mixer
picker planter printer renter
ringer singer sleeper speller
stinker sweeper thrasher

A21 Frequency = 18

1	backyard	barnyard	birchbark	carfare
	farmyard	graveyard	hardware	skylark
	starfish	streetcar	stockyard	yardstick
2	barber	farmer	garter	parker
	partner	starter		

021 Frequency = 15

1	cornflake	landlord	northland	popcorn
	sandstorm	shortcake	shortcut	shortstop
2	corner	former	order	porter
3	platform	torment (N)	transport (N)	

9,3 Frequency = 23

A25 Frequency = 11

2a	war	warm	warn	wart
2b	ward			
4a	warmth	swarm		
4b	dwarf	warm-up		
6a	wardrobe			
6b	warmer			

022 Frequency = 12

2b	word	work	worm	worth
4a	world	worst		
6a	fireworks	framework	homework	silkworm
	workshop			
6b	worker			

Block 10: Frequency = 575

10,1 Frequency = 211

I17 Frequency = 34

1	furnish	greenish	reddish	rubbish
	selfish	varnish		
2	anvil	attic	bandit	derrick
	goblin	hermit	horrid	margin
	martin	napkin	orbit	pencil
	pilgrim	pumpkin	rabbit	splendid
	summit	tennis	tonsil	torrid
	traffic	turnip	victim	worship
3	artist	dentist	district	florist

U17 Frequency = 6

1	cactus	campus	circus	fungus
2	album	stirrup		

E17 Frequency = 89

1a	darkness	gladness	illness	sadness
	sickness			
1b	careless	homeless		
2a	bidden	bitten	blacken	deepen
	fatten	flatten	harden	ridden
	rotten	sharpen	silken	sweeten
2b	dotted	spotted	stranded	
3a	actress	harness	mattress	mistress
	princess	reckless		
3b	burden	garden	happen	kitten
	mitten	pollen	sudden	
3c	wicked			
4	anklet	basket	blanket	bonnet
	bracelet	bucket	carpet	casket
	cricket	goblet	jacket	locket
	magnet	mallet	market	packet
	pallet	pellet	pocket	puppet
	racket	russet	scarlet	skillet
	tablet	thicket	ticket	trumpet
	velvet			
5	cancel	funnel	kennel	kernel
	mantel	nickel	parcel	pretzel
	tassal	tinsel	tunnel	vessel
6	absent	current	forest	garment
	harvest	hundred	object (N)	pavement
	perfect	problem	statement	subject (N)

A17 Frequency = 45

1	brakeman	busman	fireman	foreman
	freshman	huntsman	workman	
2	comma	extra	larva	Santa
3	central	dental	formal	mbral
	normal	oral	rascal	sandal
4	signal	canvas	errand	gallant
	bantam	infant	organ	pennant
	German	servant		
5a	burglar	cellar	collar	dollar
	grammar	nectar	poplar	vulgar
5b	backward	blizzard	custard	forward
	homeward	mustard	standard	upward

317 Frequency = 3

1 button   cannon   canyon   carbon
   clifton   common   cotton   crimson
   gallon   lesson   mutton   pardon
   person   ribbon   sermon
2 blossom   button   freedom   scallop
   hammock   hassock   mammoth   method
   pistol   scallop   seldom
3 actor   arbor   armor   doctor
   effort   harbor   mirror   oxford
   parlor   stubborn traitor

10,2 Frequency = 227

Y17 Frequency = 143

1 badly   barely   bravely   gladly
   hardly   homely   lately   likely
   lively   lonely   manly   nicely
   partly   prickly   promptly sadly
   safely   shapely   shortly   sweetly
   swiftly   warmly   weekly

2a billy   bumpy   creepy   curly
   dirty   dolly   dusty   fluffy
   fussy   fuzzy   greedy   hilly
   horny   inky   jelly   lucky
   messy   milky   needy   rocky
   rusty   sandy   silky   sleepy
   smarty   sticky   stormy   sulky
   tarty   thirsty   thorny   thrifty
   tricky

2b daddy   funny   fatty   furry
   mommy   puddy   puppy   skinny
   sunny   teddy   zippy

3 fifty   forty   ninety
   thirty   twenty   sixty

4a belly   berry   biddy   bonny
   buddy   bunny   ditty   dizzy
   dummy   ferry   golly   gully
   gunny   happy   hobby   holly
   hurry   jiffy   jolly   kitty
   lobby   mammy   middy   penny
   poppy   shabby   shinny   silly
   sorry   stubby   tabby   taffy
   tally   toddy   worry   wuzzy

%b angry   army   brandy   dandy
   crunky   dandy   derby   empty
   fancy   frisky   gently   glory
   grizzly   handy   hungry   husky
   kinky   lanky   mercy   merry
   nasty   pantry   party   perky
   plenty   safety   simply   stingy
   story   sturdy   tardy   teeny
   ugly   wobbly

LE22 Frequency = 84

1 apple   battle   bottle   bubble
   cattle   cradle   cripple   crippled
   fiddle   gobble   huddle   kettle
   little   middle   muzzle   nibble
   nipple   paddle   pebble   peddle
   puddle   puzzle   raffle   rattle
   riddle   ripple   ruffle   saddle
   scribble settle   tattle   wabble
2l angle   ankle   beetle   huckle
   bundle   cackle   candle   circle
   crackle   crumble   dangle   dimple
   feeble   freckle   fumble   gargle
   gentle   grumble   handle   jingle
   jungle   kindle   mantle   marble
   needle   nimble   pickle   pimple
   purple   rumble   sample   scramble
   shingle   simple   single   sparkle
   speckle   sprinkle   steeple   stumble
   tackle   tangle   temple   thimble
   tickle   tinkle   trample   tumble
   turtle   twinkle   uncle   warble

10,3 Frequency = 8

Compounds Frequency = 8

   herself   himself   itself   myself
   northwest upon   upset(V,Aj) within

10,4 Frequency = 40

116 Frequency = 14

1 indent   inflate   inform   insane
   inspect   intend   invent   invite
2 disgrace dismiss   distress disturb
3 impure   mistake

O17 Frequency = 24

1. condense — conduct(Vb) — connect — content(Aj)
   contest(Vb) — contract(Vb) — compact(Aj,Vb)
2. collect — command — commence
   complete—
3. produce(Vb) — progress(Vb) — project(Vb) — promote
   protect(Vb) — provide
4. object(Vb) — o'clock — polite
5. corral — correct — forgot — forlorn

U17 Frequency = 5

subject(Vb) — subtract — supply — support
suspect(Vb)

I17 Frequency = 2

cigar — divide

Block 11: Frequency = 214

11,1 Frequency = 41

NG10 Frequency = 41

1. backing — being — blessing — breeding
   camping — clipping — cutting — dashing
   dressing — drumming — ending — filling
   greeting — helping — landing — licking
   meeting — mending — packing — rocking
   setting — spelling — stuffing — tatting
   thrilling — trimming — trying — warning
   wedding — willing
2. cunning — darling — duckling — dumpling
   herring — kindling — morning — shirting
   stocking
3. hangar(P) — kingdom

11,2 Frequency = 97

CH10 Frequency = 68

1b. chat — check — cheek — cheer
    chess — chick — chill — chin
    chip — chop — chuck — chug
    chum
2b. beech — much — rich — such

U16 Frequency = 5

1. undress — unlace — unlock
2. unless — until

A16 Frequency = 3

pastel — transplant(Vb) — transport(Vb)

O16 Frequency = 2

stockade — trombone

E21 Frequency = 5

ferment(Vb) — percent — perfect(Vb) — perform
perhaps

O21 Frequency = 2

cornet — torment(Vb)

EE10 Frequency = 9

indeed — fifteen — fifteenth — nineteen
nineteenth — sixteen — sixteenth — thirteen
thirteenth

10,5 Frequency = 89

A17 Frequency = 38

1. aback — afar — afire — alike
   alive — alone — apart — ashore
   asleep — awake — awake
   abode — acute — address(Vb) — admire
2. admit — adopt — adult — afford
   agree — alarm — alas — alert
   amaze — annex(Vb) — apply — arrest
   arrive — assume — attack — attend
   attract
3. canal — lapel — manure — parade
   salon — salute

E17 Frequency = 20

1. except — excite — expect — explode
   explore — express — extend — extent
   entire — escape
2. between — cement — degree — describe
3. respect — restore — secrete — sedan
   select — shellac

11,3

3a: charm, chart, chest, chime; chink, chirp, choke, chore; chunk, church, churn; speech
3b: belch, bench, birch, bunch
—4b: hunch, inch, lunch, march; munch, perch, pinch, porch; punch, ranch, torch
4d: branch, crunch, French, starch; trench
6a: workbench; cheery, chilly, crunchy, rancher
6b: channel, chapter, chatter, checker
7a: cherry, chicken, children, chipmunk; chubby
7b: attach, sandwich(P)
7c: merchant, orchard
10a: chitter-chatter

TCH10 Frequency = 29

2a: itch, catch(P)
2b: batch, hitch, latch, match; hatch, patch, pitch, thatch; notch; witch; ditch, fetch
3b: crutch, Scotch, sketch, stitch; switch
5e: scratch, stretch
6a: hopscotch; stretcher
6b: catcher(P); pitcher, kitchen; satchel
7c: catchup(P); hatchet

11,3

WH10 Frequency = 23

1a: why
1b: whack, wheel, when, which; whip, whiz, whizz
3a: whale-, wharf, while; whirl, white, whine
6a: bobwhite, whalebone
6b: wheeler
7a: whimper, whinny, whisker, whisky; whisper
7c: awhile

11,4 Frequency = 24

QU10 Frequency = 24

1b: quack, queen, queer, quick; quit, quiz, quilt, quite
3a: quake, quart, squirt; quote
5c: square, squeeze, squirm; quicksand
6a: quicken
6b: quicken, quarrel
7a: quarrel, quarry, quartet, quarter
7c: banquet, squirrel

11,5 Frequency = 19

GG10 Frequency = 17

1: egg, eggplant
2: baggage, beggar, buggy, dagger; giggle, maggot, nugget, piggish; ragged, rugged, shaggy, stagger; waggle, wiggle, wiggly

CC12 Frequency = 2

hiccup, soccer

11,6 Frequency = 10

G31 Frequency = 10

1: get, girl, gift, gig
2: anger, finger, linger
3: forget, target

Block 12: Frequency = 486

12,1 Frequency = 51

AY10 Frequency = 51

2a: bay, day, gay, hay; jay, lay, may, nay; pay, ray, say, way
3b: bray, clay, gray, play; pray, slay, stay, sway; tray

12,2 Frequency = 189

5b	spray	stray	crayfish	daytime
6a	ashtray	birthday	haycock	haystack
	driveway	freeway	playmate	plaything
	maybe	pathway		
	runway	weekday		
6b	grayish	payment	player	saying
	away	display	midway	today
7b	subway	Sunday(P)		
7c	crayon	mayor	prayer	

EA11 Frequency = 145

lai	pea	sea	tea	
ii	flea	plea		
iii	peacock	peanut		
	seaweed			
lbi	deal	teacup	seashore	seasick
	real	heal	teapot	
			meal	peal
ii	squeal	seal		
iii	misdeal	steal		
iv	appeal	really		
		realize		
lc	beam	seam		
ii	cream	dream	team	steam
iii	steamer	stream	scream	
	sunbeam	steamship	streamer	streamline
		upstream		
ldi	beach	each	leach	peach
	reach	teach		
ii	preach	teacher	teaching	
iii	preacher	heap	leap	reap
le	cheap	peace		
lfi	leash			
iv	beacon	eagle		
2ai	beard	dear	ear	
	gear	hear	near	fear
	sear	shear	tear(N)	rear
ii	clear	smear	spear	year
iii	dearly	earring	near-by	nearly
	smeary	shearer	yearly	
	appear	dreary	weary	
2bi	beat	cheat	feat	eat
	heat	meat	neat	peat
	seat	wheat		
ii	bleat	pleat	treat	
iii	beaten	beater	eaten	heater
	mincemeat	neatly	neatness	

2ci	beak	leak	peak	weak
ii	bleak	creak	sneak	speak
		streak		
		squeaky		
iii	leaky	lean		wean
		lean		
2d	bean	clean	mean	mean
iii	beanbag	cleaner	cleanup	meaning
	meanwhile			
2e1	beast		feast	least
	yeast	east		
iii	northeast			
iv	Easter			
3a.	bead	lead(Vb)	read (present tense)	read (present tense)
		leader	reading	
iii	beaded			
iv	beadle			
3b1	leaf			
	leafy			
3ci	leave	weave		
iv	beaver			
3di	heath			

EA31 Frequency = 44

ii	health	wealth		
iii	healthy	wealthy		
3af	dead	head	lead(N)	read(past tense)
ii	bread	dread	spread	stead
	thread	tread		
iii	bedstead	forehead	heading	homestead
	instead	threadbare		
iv	ahead	ready	steady	
3b	bear	pear	tear(V)	wear
ii	swear			
iii	bearskin			
3ci	deaf	death	meant	sweat
	breath	breast	dreamt	sweaty
iii	breastplate	redbreast	sweater	weapon
iv	breakfast	heaven	heavy	

12,3 Frequency = 143

.0011 Frequency = 89

lai	boo	coo	moo	too
	zoo			
iv	bamboo	boohoo	igloo	shampoo
	tatoo			

[oo / wood words] — Frequency = 103

1bi	driftwood	firewood	goodby	goodness
	goodwill	goody	manhood	redwood
	woodchuck	wooded	wooden	woodland
	woodpile	woodshed	woodwork	woody
3bi	foot	soot		
iii	barefoot	footstep		
iv	afoot			
3ci	wool			
iii	woolen	woolen	woolly	
3di	hoof	woof		
3eiv	whoopee			

.12,4

OW11 Frequency = 60

1b	owe	own		
2a	bow(N)	low	mow(Vb)	row(Vb, N)
	show	shown		
2b	bowl		tow	glow
3b	blow	crow	flow	stow
	grow	slow	snow	
4b	blown	flown	grown	thrown
6a	grownup	scarecrow	showman	slowpoke
	snowbank	snowbird	snowdrift	snowdrop
	snowflake	snowman	snowstorm	
6b	bowling	grower	lowly	owner
	slowly	snowy		
7b	bellow	borrow	elbow	fellow
	follow	furrow	hollow	meadow
	mellow	minnow	morrow	pillow
	shallow	sorrow	tallow	willow
	window	yellow		

OW12 Frequency = 43

1a	ow			
1b	owl	now	cow	how
2a	bow(Vb, N)	mow(N)	row(N)	sow(N)
	wow			
2b	down	fowl	down	howl
	town			
3b	brow	gown		
4b	brown	plow	crown	crown
	drown	clown	growl	
6a	bowwow	frown	crowd	uptown
	downtown	somehow		

[oo words — left column]

1bi	coon	loon	moon	noon
	soon			
ii	spoon			
iii	forenoon	moonbeam	noonday	noontime
	teaspoon			
iv	balloon	cartoon	cocoon	harpoon
	raccoon	saloon		
1ci	boom	loom	room	
ii	bloom	broom	groom	blooming
iii	bathroom	bedroom	bloomer	lunchroom
	broomstick	classroom	gloomy	storeroom
	playroom	roommate	stateroom	
1di	coop	hoop	loop	whoop
ii	droop	scoop	stoop	swoop
	troop			
1ei	booth	tooth		
iii	toothbrush	toothpick		
1fi	boost	rooster	roost	
iv	rooster			
2i	cool	fool	pool	cool
ii	spool	stool		
iii	cooler	foolish	toolbox	
3aii	boot	hoot	loot	root
	shoot	toot		
iii	shooter	scooter		
iv	bootee	mood		
3bi	food	brood		
iv	brood	poodle		
3ci	roof			
ii	proof			
iii	fireproof			
3di	moor	poor		
3eiv	spooky			

OO12 Frequency = 54

ii	book	cook	hook	look
	looks	nook	rook	shook
	took			
ii	brook	crook		
iii	bookman	cookbook	cooker	cooky
	crooked	fishhook	hooky	notebook
	scrapbook	textbook	unhook	
iv	booklet			
3ai	good	hood	wood	
ii	stood			

Block 13: Frequency 198

13,1 Frequency = 73

6b	brownish	downy	downward	
7b	allow	bower	coward	salt
	bowel	powder	power	salty
7c	howdy	vowel	flower	
	tower		shower	

031 Frequency = 38

2b	son	ton	won	
4a	come	done	dove(N)	
	month	none	love	
	from	shove	some	
4b	front			
5a	frontward	glove		
6a	something	grandson	lonesome	someday
	lovely	sometime	tiresome	
	oven	sonny	undone	
6b	above			
7a	cover	among	color	
7c	Monday(P)	dozen	govern	compass
	wonder	nothing	shovel	income(P)
				welcome

U31 Frequency = 35

1	bull	bush	full	pull
	push	puss	put	
2	armful	bashful	careful	cheerful
	cupful	dreadful	graceful	grateful
	handful	harmful	hateful	healthful
	helpful	peaceful	playful	skillful
	spoonful	thankful		
3	bullet	bully	bushel	bushy
	butcher	fullback	pudding	pullman
	pulpit	pussy		

13,2 Frequency = 52

A23 Frequency = 26

1i	all	ball	call	fall
	gall	hall	tall	wall
ii	small	stall		
iii	baseball	fallen	football	hallway
	smallpox	snowball	snowfall	

023 Frequency = 26

2i	halt	salt	malt	toll°
iii	halter	salty	malted	
iv	altar			
3i	bald			
ii	scald			

13,3 Frequency = 73

1i	boll	poll	roll	
ii	troll	tollgate		
iii	roller			
2i	bold	cold	fold	gold
	hold	mold	old	sold
	told			
ii	scold	folder	golden	goldfish
iii	folder	molding	olden	holder
3i	bolt	colt	jolt	

022 Frequency = 21

1i	bind	find	hind	kind
	mind	rind	wind(Vb)	
ii	blind	grind	kindly	kindness
iii	binder	blindfold	wild	
	winding	windup	wildly	
2i	child	mild		
iii	grandchild	wildcat		

024 Frequency = 52

1ai	dong	gong	long	song
	tong			
ii	strong	throng		
iii	dingdong			
iv	along	oblong		
1bi	bog	dog	fog	hog
	log	tog		
	frog			foggy
1ci	clog	doggy	dogwood	
iii	bulldog	leapfrog		
	hotdog	off		
iii	blast-off	kickoff	take-off	
iv	coffee	coffin	office	
1di	loft	soft		
iii	hayloft	softly		

Block 14: Frequency = 85

14,1   Frequency = 40

Stressed VCCe#   Frequency = 40

1a	badge	dodge	edge
	fudge	judge	lodge
	pledge		
1b	hedgehog		
1c	badger	midget	
2a	fringe	hinge	sponge
2b	chance	dance	fence
	glance	lance	prance
	prince	mince	
2ci	dense	since	
	rinse		
2cii	nonsense	sense	
	immense		
3	else		
4a	bulge	shelve	twelve
4b	bronze	plunge	
	barrette	dunce	
	giraffe	lacrosse	

lei   honk
3ai   boss   loss   moss   toss
 ii   cross
iii   crossing   glossy
 iv   across
3bi   cost   lost
 ii   frost
iii   frosting   frosty
 iv   ostrich
3ci   moth
 ii   cloth

14,2   Frequency = 18

Stressed VrCe#   Frequency = 18

1a	curse	horse	purse
	verse	worse	
1b	horseback	converse	
2	carve	curve	serve
	starve	nerve	
	immerse	nurse	
3	charge	gorge	urge
		large	

14,3   Frequency = 27

Unstressed VCCe# and VCe#   Frequency = 27   Frequency = 27

1	absence	distance	entrance	sentence
	substance			
2	bandage	cabbage	college	cottage
	garbage	message	package	passage
	village			
3	furnace	justice	lettuce	necklace
	practice	service	surface	
4	capsule(P)	engine	fertile	injure
5	orange	porridge		

Third-Year Word List: Frequency = 3253

Block 15: Frequency = 915

15,1   Frequency = 84

2-3 one-syllable words with First-Year rules, Frequency = 84

Alps	bluff	brag	breed
brim	brisk	bunt	clank
clash	clef	clomp	cog
creek	deem	disc	dwelt
flank	flask	flunk	flush
fund	gland	gosh	grasp
gull	gust	gut	helm
hiss	jazz	lab	leer
lest	loll	lurl	mesh
mid	mint	mock	mull
musk	nun	puck	pulp
pus	plush	rash	scum
sect	seer	sex	sheen
sheer	shod	skeet	slash
sleek	smith	snack	sneer
snub	snug	splint	sprint
spud	steed	stilt	Swiss
tempt	text	theft	throb
vamp	vast	vat	vent
vex	vim	weld	wend
width	yam	yank	yelp

15,2   Frequency = 831

2-3 words with Second-Year rules, Frequency = 831

Block 5: Frequency = 31

5,1 Compounds

blackjack	bobcat	buckshot	buckskin
cobweb	codfish	dishpan	dishrag
flagstaff	grandad	grassland	handbag
handcuff	hemlock	humbug	jackass
junkman	pigskin	ramjet	ramrod
redskin	sheepskin	snapshot	standstill
sunbath	sunfish	sunstruck	upkeep
upland			

5,5 NG10   clung   ping

Block 6: Frequency = 41

6,1 A11	bate	blare	crape	gape
	gaze	glaze	hale	maze
I11	bile	shale	vale	prime
	sire	file	pike	swine
	thine	spire	strife	
		wile		yule
6,2 O11	bole	cope	cove	doze
	drone	grope	pore	Rome
	rote	shone	stoke	strode
	yore			
U11	brute	lute	mute	yule
E11	mere	mete		
EE10 + E18	peeve			

Block 7: Frequency = 4

7,1 C11	mace	scent	vice
G11	wage		

Block 8: Frequency = 50

8,1 Compounds

backbone	bedside	brimstone	firebug
glassware	hereby	hotline	lampshade
lifetime	red-wing	sandstone	shipmate
spruce-up			

8,2 A16	abstract	ally(N)	alpine	athlete
	baptize	bankrupt	capsize	cahsmere
	mascot	pastime	shamrock	
I16	dictate	incline(N)	impact	import(N)
	instinct	insult(N)	kidnap	linseed
U16	mishap			
E16	nutmeg	suffix		
O16	empire	export(N)	extract(N)	textile
	bonbon	combat(N)	combine(N)	complex
	compress(N)	conflict(N)	construct(N)	contact
	contrast(N)	convict(N)	prospect	

Block 9: Frequency = 95

9,1 A21	harsh	shorts	snort	
O21	scorn	blurt	burr	cur
U21	blur	turf	surf	

Code					
I21	firm				
E21	serf				
9,2 E21	blunder	butler	cancer	canker	
	capper	clatter	cobbler	convert(N)	
	creeper	cruller	culvert	differ	
	duster	elder	feeler	tinder	
	gender	glimmer	glitter	hamper	
	insert(N)	jester	jobber	killer	
	lifter	mid-term	permit(N)	plotter	
	popper	prosper	putter	rafter	
	render	rocker	scrapper	seeker	
	sherbert	shudder	slacker	snicker	
	smelter	snicker	splatter	stepper	
	sticker	suffer	tamper	tanner	
	tester	thriller	tinder	totter	
	usher	wicker			
U21	burlap	surplus	surname	turnpike	
I21	birthplace				
A21	boxcar	firearm	hardship	marker	
	parsnip	rampart	shipyard		
O21	borax	border	concord	corncob	
	cornstarch	export	import	leghorn	
	porthole				
9,3 A25	lukewarm	warbler	warden	warlike	
O22	warp	warpath	warship		
	byword				

Block 10: Frequency = 328

Code				
10,1 I17	antic	artic	bobbin	classic
	fossil	frantic	garlic	gossip
	mannish	muffin	nostril	peevish
	transit	trellis	virgin	weevil
U17	census	citrus		
E17	anthem	bracket	congress	corset
	crescent	dampen	dampness	darken
	emblem	empress	ferret	fireless
	flannel	fortress	goddess	hamlet
	hardness	harmless	helmet	helpless
	hornet	hundredth	inlet	kindred
	likeness	madness	marvel	mistrel
	morsel	picket	priceless	restless
	rickets	rocket	sadden	segment
	shipment	shorten	sleepless	sleeveless
	socket	stillness	stricken	sullen
	sweetness	tempest	thicken	tireless
	torrent	trinket	wireless	witness
	worthless			

Code				
A17	ballad	baseman	canvass	constant
	coral	craftsman	currant	delta
	distant	drunkard	garland	gizzard
	herdsman	Holland	instant	Ireland
	jackal	larval	mammal	marshal
	mental	mortal	northward	onward
	pillar	portal	scandal	shortage
	sportsman	stanza	sultan	trespass
	tundra	vassal	villa	vista
	warrant	westward		
O17	ballot	beckon	bishop	captor
	castor	custom	error	factor
	falcon	horror	parson	pastor
	ransom	reckon	rector	sexton
	splendor	sponsor	summon	terror
	victor			
10,2 Y17	belfry	burly	caddy	clergy
	crabby	curry	deeply	dimly
	dingy	dory	entry	envy
	filthy	finely	firmly	fleshy
	folly	freely	gentry	glassy
	grassy	gritty	hanky	hardy
	madly	marshy	merely	misty
	mummy	musty	petty	pigmy
	putty	rally	rarely	rudely
	scanty	scurry	scurvy	sentry
	shanty	sickly	sissy	slushy
	speedy	starry	stately	stuffy
	sultry	thickly	trusty	widely
	wintry			
LE22	ample	babble	brittle	crumple
	curdle	dazzle	drizzle	gamble
	griddle	humble	hurdle	jumble
	meddle	mingle	mumble	nettle
	nozzle	scuffle	shuttle	sickle
	spangle	spindle	startle	strangle
	throttle	tingle	topple	tremble
	trickle			
10,4 I16	disarm	discuss	disgust	dislike
	dispute	distinct	distract	import(Vb)
	impress	infect	infest	inflame
	inhale	insert(Vb)	insist	instruct
	invade	invest	misled	misspell
	sincere			
U16	submit	subsist	unfit	unfurl
	unhand	unhurt	unkept	unpack
O16	blockade			
A16	abduct(P)	adhere(P)	cascade	stampede
E21	transmit	perspire		
	permit(Vb)			

021	ornate	exceed	foresee	misdeed
EE10	canteen			
	unseen			
10,5 A17	abide	absurd	adapt	adore
	adorn	advice	affect	aflame
	ally(Vb)	amend	ascend	assess
	assist	attempt	award	aware
	career	galore	Japan	
E17	descend	descent	derive	devote
	effect	embrace	emerge	encamp
	endure	enforce	enlist	estate
	exhale	expand	expel	expend
	export(Vb)	extract(Vb)	extreme	extinct
	neglect	secede	seclude	secure
	severe			
017	combat(Vb)	combine	commit	compare
	compress(Vb)	concern	confess	confine
	confirm	conflict(Vb)	consent	consist
	construct(Vb)	consult	contrast(Vb)	convert(Vb)
	convict(Vb)	forbid	forgave	forsake
	oblige	obscene	offend	oppress
	provoke			
U17	suppress	supreme		
I17	brigade	divine		

Block 11: Frequency = 61

11,1 NG10	bedding	dwelling	gangster	inning
	matting	netting	shilling	wording
11,2 CH10	arch	archer	beechnut	chant
	char	charter	cheep	chuckle
	cinch	drench	duchess	enchant
	gulch	hunchback	leech	parch
	parchment	scorch	starchy	hemstitch
TCH10	clutch	crotch	etch	witchcraft
	pitchfork	snatch	twitch	
11,3 WH10	cartwheel	whit	whittle	
11,4 QU10	acquire	conquest	jonquil	quench
	quest	quill	quitter	quorum
	squid	squirt	squire	tranquil
11,5 GG10	druggist	luggage	smuggle	snuggle
	struggle	trigger		
CC12	accord	occur		
11,6 G31	gilt	hunger	yucca	

Block 12: Frequency = 107

12,1 AY10	array	betray	dismay	essay
	fray	gateway	maypole	midday
	portray	rayon	wayside	
12,2 EAll	beading	bleach	bleary	buckwheat
	Clearly	cleave	conceal	creaky
	creamy	dean	dreamland	dreamy
	eastern	eastward	eater	fearless
	freak	gleam	glean	meanness
	meantime	meatless	mislead	plead
	reader	seaplane	seaport	seashell
	sneaker	speaker	teat	treatment
	treaty	unclean	veal	weakly
	weakness	zeal		
EA31	bearer	bearing	bedspread	blockhead
	breastpin	breathless	deadly	dealt
	forbear	spreader	threat	threaten
12,3 OOll	bassoon	boob	bridegroom	croon
	doom	foodstuff	gloom	groove
	maroon	monsoon	noodle	ooze
	poorly	roofing	roomer	scoot
	snoop	snooze	spook	woo
	bankbook	brooklet	foothill	footprint
0012	footstool	forefoot	goodly	goodness
	woodman			
12,4 OWll	billow	blowtorch	blower	burrow
	growth	lowland	mower	mown
	downstream	Moscow	prowl	rowdy
OW12	scowl	sundown	towel	township
	vow			

Block 13: Frequency = 58

13,1 031	comfort	fearsome	hovel	hover
	London	monk	monthly	someplace
U31	bullhead	fearful	fully	glassful
	hopeful	manful	pushcart	shameful
	shot-put	sinful		
13,2 A23	handball	install	squall	goldsmith
	ahold	enroll	goldfinch	uphold
023	molder	stroll	unfold	
	volt			

```
13,3 I22   binder    blinding    childhood  childish
           grinder   grindstone  mankind    unkind

   O24   bong       bossy      Boston     broth
         bullfrog   costly     crossbar   crossbow
         crossword  flog       floss      froth
         gloss      Hong Kong  lofty      logger
         offer      ping-pong  show-off   softwood
```

Block 14: Frequency = 56

```
14,1  advance     avenge    budge      collapse
      convince    corpse    densely    dredge
      expense     France    glimpse    hence
      henceforth  incense   intense    involve
      ledge       misjudge  offense    partridge
      pence       pulse     response   ridge
      sixpence    sledge    solve      trudge
      valve       wedge     whence

14,2  barge       commerce   discharge  disperse
      divorce     enlarge    force      forge
      horsefly    horseless  horseman   largely
      serge       surge

14,3  active      bondage   captive    challenge
      doctrine    ermine    hostile    instance
      mileage     terrace   tonnage
```

Block 16: Frequency = 494

16,1   Frequency = 140

AI10   Frequency = 140

```
 1bi   aid     ail      aim
  ii   air
 2bi   bail    bait     chain    fail
       faith   gain     gait     hail
       jail    laid     lain     maid
       mail    maim     main     nail
       paid    pail     pain     raid
       rail    rain     sail     tail
       vain    wail     wait-
  ii   chair   fair     hair     lair
       pair

 4ai   faint   maize    paint    saint
       waist
 4bi   braid   brain    claim    drain
       flail   frail    grain    plain
       quail   slain    snail    staid
       stain   trail    train    trait
       stair
  ii   quaint  strain   strait   cocktail
 5ai   sprain  bobtail  cattail  mailbox
 5bi   bandaid horsetail mailbag pigtail
 6ai   hangnail mainland nailfile rainfall
       mailman  rainbow  raindrop
       railway  shirtwaist
       rainstorm
  ii   airedale airline  airplane airport
       airshaft airship  airway   armchair
       chairman haircut  hairnet  hairpin
       stairway
 6bi   faithful jailer   maiden   mainly
       painter  painting plainly  railing
       rainy    strainer trailer  trainer
       training waiter   unpaid
       airy
  ii   acquaint afraid   hairy    unfair
 7ci   complain complaint attain  await
       dainty   drainage contain  daily
       failure  gaily    exclaim  explain
       obtain   portrait(P) maintain mermaid
       sustain  restrain sailor
  ii   affair   tailor   traitor  waitress
                dairy    despair  fairy
```

16,2   Frequency = 98

OU10   Frequency = 98

```
 1bi   ouch    out
  ii   our
 2ai   thou
 2bi   bout    couch    foul     loud
       noun             mouth    pout
                        shout
       south
  ii   sour
 4ai   bound   count    found    gouge
       hound   mound             mount    pound
       round   sound            wound(Vb: past tense of wind)
 4bi   cloud   crouch   proud    scout
       slouch  shout    spout    stout
       trout
```

16,4

6a1
carload, charcoal, cloakroom, crossroad
flatboat, lifeboat, oatmeal, railroad
raincoat, roadside, rowboat, sailboat
seacoast, stagecoach, steamboat, tugboat
waistcoat(P)

ii
billboard, blackboard, cardboard, seaboard
sideboard, surfboard, uproar

6b1
boating, coastal, coaster, loafer
oaken, soapy, toaster, unload
boarder, roaring, roadster
approach

7c1
afloat
ii aboard

Frequency = 61

AW10   Frequency = 44
1b awe — awl — law — paw
2a caw — jaw — thaw — hawk
2b raw — saw — fawn
        bawl — dawn — yawn
        lawn — shawl
3b claw — craw — draw
4b crawl — drawn — spawn
5b sprawl — squaw — squawk — straw
6a crawfish — drawbridge — jigsaw — lockjaw
        outlaw — rawhide — rickshaw — sawdust
6b sawmill — seesaw — withdraw
7a drawing — lawful
7c awful — awkward — awning
        gawky — lawyer

AU10   Frequency = 17
2b haul — maul — haunt — launch
4a fault — gauze
        sauce — vault
6a saucepan
7a auburn — August — author
7c applaud — faucet — laundry
        saucy

OI10   Frequency = 26
1b oil — saucer

16,5

16,3

ii flour, scour, lounge, pounce
        ground, bounce, sprout
5a1
5b1
6a1 background, blowout, countdown, cutout
         dugout, fairground, foreground, hideout
         lookout, outfit, outline, outplay
         output, outrage, outside, outskirts
         playground, roundup, snowbound, southeast
         southwest, without
6b1 counter, countless, cloudy, founder
         loudly, mouthful, outer, outing
         pouter, proudly, roundish, slouchy
         soundly
7a1 outlet, account, amount
         about, around, aloud, council
         announce, countess, compound, discount
         counsel, foundry, county, pronounce
         flounder, surround, grouchy
         southward
ii devour

Frequency = 90

OE10   Frequency = 7
1 doe, foe, hoe, toe
       woe
2 tiptoe, toenail

OA10   Frequency = 83
1b1 oak, oat, oath
         oar
ii whoa
2a1 boat, coach, coal, coat
         coax, foam, goal, goat
         load, loaf, loam, loan
2b1 moan, moat, poach, roach
         road, roam, roan, shoal
         soak, soap, toad
ii boar, roar, soar
4a1 boast, coast, roast, toast
ii board, hoard
4b1 bloat, cloak, float
5b1i groan, throat
          coarse, hoarse, croak

EW10 Frequency = 30

2a	chew	dew	few**	mew**
	new	pew*	whew	
3b	blew*	hrew*	crew*	drew*
	flew*	grew*	stew*	threw*
5b	screw*	strew*	strewn*	
6a	brandnew	dewdrop	newborn	New York
6b	newly	unscrew*		
7b	anew			
7c	jewel	pewter**	sewer	
	steward	sewage		

Block 17: Frequency = 406

17,1   Frequency = 125

three-syllable compounds   Frequency = 125

afternoon	alderman#**	alongside	angleworm
applesauce	archbishop	backwoodsman#	baggageman*
barbershop	basketball	battleship	blackberry
blueberry	bluebonnet	bric-a-brac	bumblebee
buttercup	butterfly	buttermilk	butternut
butterscotch	buttonhole	candlestick	cannonball
checkerboard	coffeepot	commonwealth	cottonseed
cottontail	cottonwood	counterpane	crackerjack
cubbyhole	dairyman**	fairyland	fellowman*
ferryman**	ferrybnat	fingernail	fingerprint
firecracker	fisherman**	flowerpot	flyaway
forefinger	gentleman**	gingerale	gingerbread
goldenrod	Grand Canyon	grandchildren	granddaddy
grasshopper	gunpowder	headquarters#	hereafter
hobbyhorse	Hollywood	horsepower	hummingbird
jellybean	jellyfish	leadership	lollypop
lumberjack	lumberman**	lumberyard	membership
midsummer	mockingbird	motorboat	needlework
New Orleans#	northeastern	northwestern	orangeade
outerspace	palbearer	partnership	peppermint
pineapple	pocketbook	pumpkinseed(P)	

(oi)

3b	boil	coil	coin	foil
	join	loin	soil	toil
4a	choice	voice	joint	moist	point
4b	broil	spoil		
5a	spoilt			
6a	oilcloth			
6b	pointer	oily		
7a	ointment			
7c	appoint	avoid	coinage	doily
	toilet			

OY10   Frequency = 22

2a	boy	coy	joy	toy
6a	bellboy	boyhood	cowboy	soybean
6b	tomboy	toyland	toyshop	
7a	boyish	joyful		
7b	oyster			
7c	ahoy	annoy	destroy	employ
	enjoy	royal	voyage	
	loyal			

16,6

Frequency = 57

UE10   Frequency = 20

2a	due	hue**	sue	
3b	duel	fuel**		
3b	blue*	clue*	flue*	glue*
	true*			
4b	cruel*			
6a	bluebell*	bluebird*	bluejay*	blueprint*
	skyblue*			
6b	cruelly*	untrue*		
7b	argue**	rescue**		

UI10   Frequency = 7

1	fruit*	juice	suit
2	fruitcake*	grapefruit*	lawsuit
3	pursuit		

-y Frequency = 14

1	bony	grimy	icy	scaly
	scary	shady	shaky	shiny
	smoky	stony	wavy	
2	fleecy	horsy	juicy	

-s Frequency = 50

1a	airs	arms	blinds	blues
	dues	eaves	goods	greens
	gums	hers	lens	means
	news	ours	shears	suds
1b	backwoods	beeswax	downstairs	insides
	newsboy	newsman	newsmen	salesman
	sideways	statesman	sweepstakes	tenpins
	upstairs	upwards		
1c	gallows	goggles	manners	oodles
	pincers	pliers	rompers	rubbers
	tidings	tweezers		
1d	ourselves	selves	sheaves	themselves
	wives			
2a	blazes	glasses	riches	
2b	funnies	studies		

-ed Frequency = 30

1ai	armed	bagged	barbed	bobbed
	chapped	charred	heeled	mashed
	skilled	tanned	webbed	winged(P)
1aii	checkered	concerned	doctored	hardboiled
	tattered			
1b	blessed(P)	peaked(P)		
2ai	bored	tired	famed	striped
2aii	ashamed	freckled	refined	unruled
2b	dated	faded		
3	candied			

Frequency = 116

17,3

-er Frequency = 47

1a	commander	container	customer	destroyer
	employer	follower	forester	gardener
	kidnapper	propeller	sharpener	sufferer
	trumpeter	transformer		
1b	announcer	condenser	divider	explorer
	producer	subscriber	villager	voyager

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pussycat	quarterback	quicksilver	rattlesnake
runaway	salesmanship#	silverware	skyrocket
southeastern	southwestern	sportsmanship**	sunbonnet
strawberry	storybook	summertime	tenderfoot
sunflower	tattletale	teakettle	tinderbox
three-cornered	trustworthy	thunderstorm	underground
ting-a-ling	underneath	underbrush	undershirt
underline	understand	underpass	undertake
underskirt	understand	understood	wildflower
undertook	underwear	uppercut	wonderland
windowpane	wintergreen	wintertime	

17,2

-er Frequency = 165

1	baker	blazer	choker	diner
	diver	driver	glider	grader
	hater	liner	maker	miner
	piper	poker	Quaker	racer
	rider	rover	ruler	saver
	scraper	shaker	shiner	skater
	tamer	trader	tuner	voter
2	carver	dancer	freezer	ledger
	lover	server	weaver	
3	fiddler	gobbler	muffler	peddler
	rattler	sampler	settler	sparkler
	tumbler			
4	drier	flier		

-en Frequency = 9

1	broken	frozen	ripen	shaken
	spoken	stolen	taken	waken
	woven			

-ing Frequency = 16

1	aging	biting	boring	daring
	dining	icing	lining	making
	piling	saving	shaving	siding
	striking	tubing		
2	bluing	carving		

---

* -man [mæn]   ** -man [mæn]   # -man [man]   # s ⟶ [z]

	refuel	regard	rejoice	relate
	relay	relent	rely	remain
	remains	remark	remind	remit
	rename	repaid	repair	repay
	repeal	repeat	report'	request
	require	retail	retire	return
	reveal	revenge	reverse	revive
	revolve	reward		
2	became	become	befall	before
	began	begin	begun	behave
	beheld	behind	behold	belong
	below	beneath	berate	beside
	besides	beware	bewitch	beyond
3	debate	detay	decent	decide
	decoy	deduct	defeat	defect
	defend	defense	define	delay
	demand	deny	depart	depend
	deport	detail	detect	device
4	elapse	elect	elope	equal
	era (P)	erect	even	event
	evil			
5	precede	predict	prefer	prefix
	prepaid	prepare	pretend	prevail
	prevent			
6	cedar	female	fever	frequent
	legal	meter	pecan (P)	scenic
	serum	tepee		
7	beginner	belonging	beloved (P)	equally
	frequently	recently	reducer	related
	reminder	reporter	retailer	revolver
	revolving			

013 Frequency = 73

1	oboe	odor	omit	opal
	open	oval	over	
2	proceed	prolong	protest	
3	bonus	cocoa	colon	cozy
	focus	holy	hotel	kodak
	local	locate	locust	mobile (P)
	Mohawk	molar	moment	motel
	motor	nomad	notice	polar
	Polish	pony	robot	Roman
	romance	rotate	sober	soda
	sofa	solar	thorax	token
	topaz	total	totem	vocal

2a	anteater	bookkeeper	bootlegger	cowcatcher(P)
	dogcatcher(P)	innkeeper	frankfurter	hairdresser
	hamburger	roadrunner	kingfisher	nutcracker
	penholder	woodcutter	sheepherder	stonecutter
	storekeeper	dressmaker	woodpecker	
2b	caretaker	skyscraper	lifesaver	outsider
	sandpiper		teenager	

-en Frequency = 3

awaken	forgotten	forsaken

-ing Frequency = 12

bookkeeping	bottling(P)	concerning	dairying
furnishings	happening	oncoming	outstanding
pertaining	seafaring	surroundings	Thanksgiving

-ed Frequency = 6

assorted	back-handed	excited	forested
left-handed	redheaded		

-ly Frequency = 48

1	aimlessly	bitterly	breathlessly	carelessly
	commonly	constantly	correctly	cowardly
	directly	eagerly	entirely	evenly
	extremely	foolishly	formerly	heavenly
	helplessly	immensely	instantly	intensely
	lovingly	normally	orderly	perfectly
	politely	quarterly	securely	severely
	sincerely	suddenly	westerly	willingly
2	angrily	cheerily	happily	heavily
	luckily	merrily	readily	steadily
3	awfully	carefully	cheerfully	faithfully
	gracefully	joyfully	peacefully	thankfully

Block 18: Frequency = 518

18,1 Frequency = 307

E13 Frequency = 123

1	rebel(Vb)	recall	recede	receat
	recess	recite	record(Vb)	redeem
	reduce	refer	refine	reform

clover crocus grocer pronoun
slogan storage

4 moreover motorcar motorman opener
5 opening orally overalls overboard
overcast overcoat overcome overflow
overhaul overhead overhear overjoyed
overland overlook oversleep overtake
overturn

A13   Frequency = 43

1 acorn agent baby bacon
caper crater crazy fatal
favor flavor gravy haven
hazel label labor laden
lady lazy major naked
native naval navy pagan
paper radar raven razor
saber taper vacant vapor
wafer

2 babytalk flavoring laborer ladybug
landlady lazily newspaper sabertooth
sandpaper wallpaper

I13   Frequency = 39

1 ideal iris Irish item
ivy

2 china(China) cider digest direct (P)
divan (P) fiber final finance
license lilac minor minus
minute (Aj) pilot pirate rival
silence silent siren tidy
tiger tiny viking vizor
wiry

3 bridal climate Friday private
spider spiral

4 chinaware finally silently
silent

U13   Frequency = 29

1 li Cuba** cubic** duty hula*
human** (P) humane**(P) humor** (P) July

puny** pupil** ruby* rumor*
tulip tunic tutor unit**
unite**

111 during jury mural** rural*
21 brunette* brutal* plumage* student
stupid truly*
ii plural*
3 superman

18,2   **Frequency = 152**

S20   **Frequency = 95**

2a use (Vb) cheese chose close (Vb)
2b cause hose muse noise
fuse pause pose raise
nose rose these those
rise

3b wise bruise cruise praise pose
bruise clause

6a crosswise likewise primrose rosebud
rosewood sunrise

6b chosen easy noisy noiseless
rosy unused unwise wisely
abuse (vᵤ) accuse advise amuse

7b applause arise arose because (P)
Chinese (P) compose comprise confuse
despise excuse expose oppose
refuse repose suppose surprise (P)

7c daisy desert (Vb) miser desire
drowsy laser deserve music
peasant poison pleasant present (Vb)
preserve preside presume raisin
reason resent reserve resist
resolve resort result rosette
season thousand thousandth treason
trousers weasel

8a cheeseburger cheesecloth
8b amusing composer pleasantly
seasoning noiselessly easily

* = always pronounced [u]
** = always pronounced [yu]
Unasterisked words may be pronounced either [u] or [yu], but [u] predominates.

Block 19: Frequency = 228

19,1   Frequency = 82

-ment   Frequency = 23

1	advancement	agreement	amendment	amusement
	announcement	appointment	attainment	contentment
	employment	enjoyment	engagement	enrollment
	equipment	excitement	goverment	investment
	settlement			
2	apartment	assortment	compartment	department
	deportment	embankment		

-or   Frequency = 14

1	conductor	contractor	director	erector
	governor	inspector	instructor	inventor
	professor	projector	equator	survivor
2	advisor	dictator		

-ive   Frequency = 14

1	attractive	detective	digestive	effective
	excessive	inventive	oppressive	possessive
2	progressive	destructive	expensive	explosive
	extensive	exclusive		

-ness   Frequency = 12

1	carelessness	eagerness	foolishness	gentleness
	politeness	selfishness		
2	bushiness	cleanliness	happiness	laziness
	loveliness	readiness		

-ance/-ant   Frequency = 19

1	admittance	allowance	appearance	assistance
	assistant	attendance	attendant	descendant
	performance			
2	alliance	endurance	ignorance	ignorant
	reliance			
3	abundance	abundant	accordance	importance
	important			

S21   Frequency = 57

1a	blouse	grouse	house (N)	louse
	mouse			
1b	bathhouse	birdhouse	boathouse	clubhouse
	farmhouse	greenhouse	henhouse	hothouse
	houseboat	household	housekeeper	housemaid
	housetop	housewife	housework	meetinghouse
	mousetrap	pesthouse	playhouse	powerhouse
	roundhouse	smokehouse	storehouse	warehouse
2a	base	case	chase	vase
2b	basement	bookcase	erase	eraser
	pillowcase	purchase	showcase	staircase
	suitcase			
3	cease	crease	decrease	grease
	greasy (P)	increase	lease	release
4	caboose	goose	gooseberry	loose
	loosely	moose	noose	

18,3   Frequency = 29

A22   Frequency = 29

1	Arab	baron	caret	carol
	caroler	grandparent	parent	Paris
	tariff	vary		
2	arrow	arrowhead	barrel	barren
	carrier	carrot	carry	carryall
	garret	harrow	marrow	marry
	narrow	parrot	sparrow	tarry
	wheelbarrow			
3	scarce	scarcely.		

18,4   Frequency = 30

025   Frequency = 30

1	fro	go	ho	lo
	no	so	tho	
2	hero	hobo	polo	silo
	solo	yoyo	zero	
3	alto	auto	banjo	bingo
	bronco	burro	cargo	fatso
	grotto	jello	lasso	lotto
	motto	stucco		
4	ago	hello		

19,2   Frequency = 88

IE11   Frequency = 8

1	die, tie	fie	lie	pie
2	magpie	necktie	untie	

I24 + GH10   Frequency = 60

2a	high	sigh	thigh	
2b	fight	light	might	night
	right	sight	tight	
4a	tights			
4b	blight	bright	flight	fright
	plight	slight		
6a	airtight	daylight	flashlight	foresight
	headlight	highchair	highjump	highland
	highway	lighthouse	midnight	moonlight
	nightgown	nighttime	right-hand	skylight
	streetlight	sunlight	upright	
6b	brighten	brightly	brightness	fighter
	frighten	frightful	highly	lighter
	lightly	mighty	relight	rightly
	slightly	tighten	tightly	
7c	delight	lightning	tonight	twilight
8a	overnight			
8b	delighted	highlander	right-handed	sight-seeing

GH10   Frequency = 13

1	bough	plough		
2	caught	naught	straight	taught
3	daughter	granddaughter	haughty	naughty
	slaughter	slaughterhouse	straighten	

H20   Frequency = 7

1	herb	hour	
2	huh	pooh	ugh
3	graham	shepherd	

19,3

K20   Frequency = 59   Frequency = 26

1a	knee	knew	know	knell
1b	knack	knead	kneel	knoll
2	knit	knob	knock	
3	knot			

G20   Frequency = 9

1	gnat	gnaw	
2a	assign	design	resign
	sign		
2b	campaign	signboard	

W20   Frequency = 24

1b	wrap	wrath	wreath	wreck
	wren	wring	wrong	
	wrench	write	wrote	
3a	wrench	wrist	shipwreck	
6a	unwrap	rewrite	wrapper	wrecker
6b	wringer	writer	wristlet	written
7a	wrigly	wrinkle		
8a	handwriting			

19,4

B20   Frequency = 13   Frequency = 13

2b	bomb	dumb	lamb	limb
3b	numb	thumb		
6a	crumb	plumb		
6b	dumbbell	lambskin	thumbtack	
	bomber	plumber		

19,5

L20   Frequency = 40   Frequency = 21

1a	balk	chalk	stalk	talk
1b	walk	chalkboard	cornstalk	sidewalk
	beanstalk	walker		
2	talker	folk	kinsfolk	yolk
3	behalf	calf	half	halfway
4	calves	salve		
5	salmon			

T20   Frequency = 19

1	bristle	bustle	castle	gristle
	hustle	jostle	nestle	rustle
	thistle	trestle	whistle	wrestle
2	fasten	glisten	listen	listener (P)
	moisten			
3	often	soften		

-less   Frequency = 4

colorless   odorless   penniless ($y[i] \rightarrow i[ɪ]$)
regardless

-ist   Frequency = 4

royalist   motorist   organist   soloist

-ish   Frequency = 2

kittenish   yellowish

19,6   Frequency = 121

U20   Frequency = 6

1	guard	guess	guest	guide
2	guilty	safeguard		

20,2   Frequency = 39

Block 20: Frequency = 121

PH10   Frequency = 19

3a	phase	phone		
3b	graph			
4c	phrase			
5c	sphere	sphinx	phony	photo
7a	asphalt	pheasant	graphic	nephew
7c	orphan	camphor	phosphate	prophet
	sulphur	pamphlet		

20,1   Frequency = 49

-y   Frequency = 12

1	archery	armory	cannery	creamery
	Germany	pottery	unity	
2	injury	sunshiny	rivalry	
3	agency	loyalty		

CH31   Frequency = 20

3a	chord			
4c	chrome			
5a	school			
5c	scheme			
6a	schoolbag	schoolboy	schoolhouse	
	schoolmate	schoolbook	schoolroom	schooltime
6b	schooling	schooling		
7a	chorus	christen		
7b	stomach			
7c	echo	orchid	schooner	
8a	schoolmaster	schoolteacher		

-ful   Frequency = 9

colorful   forgetful   plentiful ($y[i] \rightarrow i[ɪ]$)
powerful   sorrowful   teacupful   teaspoonful
unhealthful   wonderful

-al   Frequency = 12

1	orbital	personal	musical	
2	arrival	festival	renewal	recital

20,3   Frequency = 27

-able   Frequency = 6

1	passable	peaceable	seeable	suitable
2	likable	lovable		

TH12   Frequency = 27

1a	bother	brother	farther	feather
	further	gather	leather	mother
	other	rather	smother	weather
	whether	whither	wither	

-eth   Frequency = 5

fiftieth   fortieth   sixtieth   thirtieth
twentieth

notion
station

connection
direction
exception
instruction
protection

confection

location
rotation

taxation

description
intention
reduction

impression

seclusion
provision

feature
lecture

---

nation
section

collection
correction
eruption
inspection
prevention

commotion
solution
donation,
relation

plantation

convention
inscription
reception

suggestion

expression
permission
succession
tension
expansion

explosion
division

culture
future

---

motion
potion

attraction
contraction
election
infection
objection
subtraction
carnation
salvation
diction
promotion
vacation
foundation

starvation
conjunction
detention
production

sectional
digestion

session
discussion
profession
commission
procession
pension
dimension

occasion
excursion
erosion
decision

creature
fracture

---

mention
portion
traction
adoption
construction
distinction
extraction
invention
selection
affection
proportion
devotion
oration
translation
formation
temptation
quotation
attention
destruction
junction
subscription
fractional
question

2a
2b
3
4a
4b
5
6
7

21,3   Frequency = 32

mission
confession
possession
admission
percussion
mansion
convulsion

1a
1bi
1bii
1biii
2a
2b

-sion → [ŝen] Frequency = 20

-sion → [ẑen] Frequency = 12

abrasion
diversion
conclusion
collision

1
2
3a
3b

21,4   -ture Frequency = 27

capture
fixture

1

20,4   1b   brotherhood   brotherly   gatherer   godmother
              grandmother   leathery   otherwise   pinfeather
              stepmother   weatherman
        2   northern
        3   breathe

CØ11   Frequency = 6

        Frequency = 6
        1   accent   accept   succeed   success
        2   acceptance successful

Block 21: Frequency = 177

21,1   Frequency = 37

un→   Frequency = 19
        unbroken   unbuckle   unconcerned
        uncover   uneasy   unhappy
        unharness   unhealthy   unlawful
        unlucky   unpleasant   unselfish
        untangled   untidy

re→   Frequency = 6
        readmit   reconstruct recover   reelect
        remember   reopen

dis→   Frequency = 5
        disagree   disappear   disappoint discover
        disorder

in→   Frequency = 4
        incorrect   informal   inhuman   injustice

mis→   Frequency = 3
        misbehave   misconduct   mispronounce

21,2   Frequency = 81

-tion   Frequency = 81
        1   action   auction   caution   diction
             faction   fiction   fraction   friction

Block 22: Frequency = 334

22,1   Frequency = 93

Stress pattern 3B₂   Frequency = 93

1a
absolute	advertise	altitude
antelope	antiquate	atmosphere
attitude	calculate	centipede
concentrate	cultivate	envelope (N)
fascinate	illustrate	indicate
irrigate	multitude	estimate(Vb)
vaccinate	ventilate	institute
alternate(Vb)	sensitize	substitute
	vestibule	
	circulate	

1b
fumigate	harmonize	fertilize
longitude	marmalade	hibernate
organize	persecute	merchandise (P)
vaporize	porcupine	turpentine

2
certify	crucify	dignified	fortify
justify	lullaby	magnify	multiply
mummify	notify	occupy	purify
terrify	testify		

3
alphabet	architect	autograph	Bethlehem
caravan	consequence	daffodil	difficult
frankinsense	paragraph	parallel	penmanship
phonograph	photograph	substrahend	thermostat
	astronaut	barbecue	buffalo

4
afteroom	celluloid	chickadee	corduroy
bungalow	indigo	marigold	mistletoe
dinosaur	parakeet	peekaboo	piccolo
nowadays	uniform	universe	yesterday
somersault			

22,2   Frequency = 130

Stress pattern 3A   Frequency = 130

1
allergy	ancestry	artery	battery
balcony	century	charity	company
contrary	cranberry	currency	dignity
gallery	industry	mercury	mulberry

2
mixture	moisture	nature	pasture
picture	posture	puncture	rapture
rupture	sculpture	structure	torture
venture	vulture		
adventure	furniture	overture	seacreature

2
pharmacy	primary	prophecy	possibly
purity	rickety	rotary	summary
tendancy	terribly		
article	barnacle	capable	constable
follicle	horrible	icicle	multiple
notable	particle	pinnacle	popsicle
portable	possible	rectangle	sensible
	terrible		

3
spectacle	cannibal	vehicle	funeral
admiral	interval	carnival	practical
hospital	sentinel	numeral	vertical
principal		terminal	

4
ancestor	carpenter	character	circular
corridor	cucumber	emperor	juniper
mariner	messenger	milliner	officer

5
passenger	singular	formula	gondola
algebra	Florida		
orchestra	taffeta		

6
abdomen(P-AS)	bacterin	badminton (P)	bulletin
cardigan	cinnamon	coconut	copilot
emphasis	garrison	invalid (P-AS)	mannikin
moccasin	octopus	paraffin	Puritan
	vitamin		

5 / 7
stewardess	afterward	wilderness	applicant
accident	consonant	afterwards	excellent
compliment	implement	continent	incident
immigrant	instrument	impudent	

8
innocent	sentiment	ornament	pharmacist
permanent	adjective	supplement	testament
accurate	confidence	alternate(Aj)	ambulance
armistice	opposite	countenance	estimate(N)
juvenile(P)	transitive	ordinance	orphanage
talkative			

22,3   Frequency = 91

Stress pattern 3C   Frequency = 91

1
Alaska	alfalfa	angora	antenna
bandanna	bermudas	chinchilla	crayola
diploma	gorilla	saliva	vanilla
veranda	victrola	umbrella	

2
another	December	disaster	divisor
embroider	encounter	endeavor	November
October	remainder	semester	September
suspenders	together		

3
Chicago	contralto	flamingo	kimono
memento	pimento	potato	tobacco
tomato	tornado	torpedo	volcano

Fourth-Year Word List: Frequency = 1148

Block 23: Frequency = 153

23,1 Frequency = 73

A29 Frequency = 29

1a	baste	haste	paste	taste
	waste			
1b	distaste	hasten	hastily	hasty
	pasteboard	paster	pastry	tasteless
	tasty	wastebasket		
2	arrange	arrangement	change	changeable
	exchange	mange	mangy	range
	ranger			
3	angel	danger	endanger	stranger

A24 Frequency = 44

1	wad	wan	wand	want
	wash	wasp	watch	
2	swamp	swan	swat	
3	flyswatter	swampy	swatter	unwashed
	washbasket	washer	Washington[6]	washtub
	watchdog	watchmaker	watchman	whitewash
4	swallow	waffle	wallet	wallop
	walnut	walrus	wampum	wander
	wanderer	water	waterer	waterfall
	waterway	watery	wigwam	
5	quality	quantity	squab	squad
	squander	squash	squat	

23,2 Frequency = 49

I35 Frequency = 22

1a	ski		ti	
1b	Hopi			
2	confetti	marine	quarantine	ravine
	chlorine	submarine	tangerine	vaccine
	sardine	farina	handicap	mobile(P)
3	casino	pinochle	police	policeman
	petticoat			
	polliwog			

I25 Frequency = 27

1	billion	communion	million	millionaire
	onion	pavillion	rebellion	reunion
	stallion	union		

4	abandon	accustomed	appendix	asbestos
	bronchitis	domestic	elastic	electric
	embarrass	fantastic	galoshes	gigantic
	heroic	historic	horizon	indignant
	interpret	majestic	molasses	narcissus
	oppossum	opponent	persimmon	romantic
	tobaggan	transparent		
5	apostle	apparel	assemble	eternal
	illegal	immortal	orchestral	resemble
	utensil			
6	adhesive	advantage	assembly	canary
	committee	dependence	determine	employee
	infertile	intestine	percentage	productive
	remembrance	resemblance	tomorrow	

22,4 Frequency = 20

Stress pattern 3D Frequency = 20

1	absentee	buccaneer	chimpanzee	engineer
	guarantee	halloween(P)	velveteen	
2	bayonet(AS)	clarinet	contradict	correspond
	entertain	impolite	intercede	interfere
	interrupt	introduce	kangaroo	mandolin
	mayonnaise (AS)			

-er   Frequency = 6

| discoverer | fertilizer | multiplier | overseer |
| photographer | undertaker | | |

-or   Frequency = 8

| captivator | cultivator | incubator | insulator |
| numerator | percolator | supervisor | ventilator |

-ed   Frequency = 2

| complicated | disappointed | | |

-ly   Frequency = 14

1
apparently	contentedly	disorderly	exceedingly
excitedly	extensively	intimately	personally
practically(P)	respectively	respectively	unwillingly
respectfully	successfully	wonderfully	

2

24,2   Frequency = 89

E38   Frequency = 38

1a / 1b
exit	exile	Texas	Mexican
exercise	execute	flexible	
Mexico			

2a
clever	crevice	devil	ever
levee	lever	level	levy
never	seven	seventh	sever
devastate	eleven	eleventh	evergreen

2b
evermore	evidence	evident	forever
however	revenue	seventeen	seventeenth
seventy	whenever	whichever	
everlasting	evidently	Beverly Hills	

2c

I38   Frequency = 22

2a
civic	civics	civil	forgive
give	giver	live(Vh)	liver
quiver	river	rivet	shiver
sliver	shortlived	shrivel	vivid
civilize	cod-liver	deliver	forgiveness
liverwurst	privilege		

2b

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behavior	junior	savior	senior
ammonia	begonia	magnolia	petunia
interview	review	view	viewer
brilliant	convenience	convenient	genial(P)
peculiar			

2
3
4
5

23,3   Frequency = 31

Y11   Frequency = 8

| linotype | lyre | paralyze | style |
| teletype | type | typewrite | typewriter |

Y13   Frequency = 6

| asylum | dynamite | papyrus | stylish |
| typist | tyrant | | |

Y15   Frequency = 7

| antonym | Brooklyn | Egypt | gym |
| lynch | lynx | myth | |

Y16   Frequency = 10

crystal	gymnastics	gypsy	hypnotize
pygmy	syllable	symbol	sympathy
symphony	system		

Block 24:   Frequency = 224

24,1   Frequency = 50

Four-syllable compounds   Frequency = 12

brother-in-law	dictatorship	forget-me-not	huckleberry
jack-o-lantern	merry-go-round	morning-glory	relationship
San Francisco	self-reliance	sister-in-law	United States

-ing   Frequency = 7

| appetizing | embarrassing | magnifying | merrymaking |
| self-governing | understanding | undertaking | |

-y   Frequency = 1

difficulty

A38   Frequency = 21

1a	axis, saxophone, cavern, savage, travels	taxi	profit, deposit, abolish, solid	vomit
1b	axle, taxicab, gravel, travail(P)	have, tavern	profiteer, depositor, astonish	polish
2a			ravel, travel	
2b	avalanche, lavender	cavity, scavenger, davenport		

O38   Frequency = 8

1a	foxy	oxen
2a	novel	proverb
2b	poverty	province, providence, novelty

24,3

A28   Frequency = 67 / **Frequency = 19**

1a	magic, chromatic, volcanic	magical, dramatic	panic, dramatics	mechanic
1b				
2a	habit, banish			
3	acid	radish		
4	rapid, rapidly	inhabit, invalid (meaning "not valid"), rapids	Spanish, vanish	

E28   Frequency = 9

1a	relic	
1b	athletic	athletics
2a	credit	
2b	editor	inherit
3	cherish	perish, pathetic

24,4   Frequency = 18

General primary vowel Rule 27   Frequency = 18

1	humanity, rapidity	humidity, vitality	morality
2	activity, nobility	captivity, gravity	prosperity, hostility
3	ability, simplicity	capacity, stability, facility, vicinity	posterity

Block 25:   Frequency = 248

25,1   Frequency = 62

-tion   Frequency = 62

1a	interjection, arbitration	intersection, circulation	reconstruction, compensation	constipation, cultivation
1b	constitution, contribution, distribution, irrigation, ventilation	corporation, illustration, fascination, numeration	institution, navigation	vaccination
2a	annexation, transportation	cancellation	confirmation	information
2b	admiration, conversation, observation, composition	combination, exploration, perspiration, disposition	conservation, inspiration, respiration, exposition	consolation, invitation, opposition
3	application	exclamation	explanation	inflammation
4	introduction	occupation		
5	definition, proposition, resolution	preparation, recitation, revelation	preposition, reputation, revolution	preservation, reservation

I28   Frequency = 17

1a	clinic, artistic, limit, visitor	mimic, pacific, spirit	terrific, spirited	visit
1b				
2a				
2b	prohibit, diminish, frigid	solicit, finish, timid	unfinished	

Y28   Frequency = 1

1a	physic	physic

O28   Frequency = 21

1a	chronic, phonics, tropical, alcoholic	comical, tonic	frolic, topic	phonic, tropic
1b		masonic	atomic	

25,2

6 ammunition aviation constellation jubilation
   jurisdiction

I26 Frequency = 65
     Frequency = 30
1a   dial   diet   giant   liar
     lion   riot
1b   briar   friar   quiet   science
     trial   triumph
2a   quietly   quietness sealion sundial
     triumphant
2b   diagram   diary   iodine   liable
               scientist triangle viaduct
     pioneer   violence   violet   violet
     violate
     violin

Y26 Frequency = 2
     cyanide   hyena

U26 Frequency = 12
1   bluish   bruin   duet   fluid
     ruin   suet   truant
2   annual   annually(P) duofold influence
     suicide

E26 Frequency = 15
1   create   meow   creation idea
     area   cereal   museum   peony
2   leotard   meteor   reaction rodeo(AS, P)
     preamble prearrange
     theater

O26 Frequency = 4
     oasis   poem   poet   poetry

A26 Frequency = 2
     gaity   mosaic

25,3   Frequency = 40

I36   Frequency = 38
1   fiord   folio   polio   portfolio
2   curio   studio   medium   premium
       radio   helium
3   calcium   stadium   barrier   champion
4   radium   audience   guardian Indian
       alien   foliage   median   oriole
       chariot   maniac   radius   ruffian
       lariat   radiant   viola   warrior
       period   terrier
       serial   zodiac
5   zinnia   championship hurriedly radiator
                              radiator

Y36   Frequency = 2
       embryo   Tokyo

25,4   Frequency = 33

A12   Frequency = 18
1   able   cable   cradle   fable
       gable   ladle   maple   sable
       stable   staple   table
       enable   tablecloth tablespoon tablespoonful
2   tableware timetable unable

I12   Frequency = 9
       Bible   bridle   entitled idle
       idleness idly   rifle   title
       trifle

Y12   Frequency = 2
       cycle   motorcycle

O12   Frequency = 2
       noble   nobleman

U12   Frequency = 2
       bugle   bugler

25,5   Frequency = 48

E14   Frequency = 20
1   reflect   reflection   refrain   refresh
   refreshment   regret   replace   reply
   retract   retreat
2   cathedral   declare   decline   decrease
   deprive   eclipse   Negro   secret
   secretly   zebra

I14   Frequency = 9
   biplane   library   microphone   microscope
   migrate   migration   nitrate   tigress
   vibrate

Y14   Frequency = 4
   cyclone   cypress   hydrant   hydrogen

A14   Frequency = 8
   April   apron   fragrance   fragrant
   patriot   patriotic   patronize(P)   sacred

O14   Frequency = 4
   okra   only   proclaim   program

U14   Frequency = 3
   duplicate(P)   lubricate   nutrition

Block 26:   Frequency = 316

26,1   Frequency = 37

-able   Frequency = 19
1   accountable   agreeable   available   comfortable(P)
   dependable   enjoyable   favorable   obtainable
   profitable   reasonable   remarkable   respectable
   noticeable   serviceable
2   adorable   desirable   excusable   valuable(P)
3   reliable
4

-ment   Frequency = 5
   advertisement   astonishment
   disappointment   embarrassment
   entertainment

-al   Frequency = 8
1   continental   departmental   electrical   historical
   oriental
2   congressional   emotional   professional

-ness   Frequency = 2
   effectiveness   unselfishness

-ary   Frequency = 2
   dictionary   missionary

-ist   Frequency = 1
   violinist

26,2   Frequency = 36

IE12   Frequency = 13
1   birdie   brownie   cookie   kiddie
   laddie   lassie   coolie   hippie
2   caddie   collie   prairie
   kewpie   mashie

EY17   Frequency = 23
1   mousey   pulley   chimney   donkey
   alley   barley   honey   jockey
   galley   hockey   parley   parsley
   money   monkey   valley   volley
   trolley   turkey   honeymoon   honeysuckle
3   honeybee   honeydew
   volleyball

26,3   Frequency = 10

EI10   Frequency = 10
   bargain   captain   certain   certainly
   curtain   fountain   mountain   mountainside
   uncertain   villain

26,4 EA33   Frequency = 18

1b	earn	earth	
2b	heard	learn	pearl	search
4a	hearse		
6a	earthquake	earthworm	searchlight
6b	pearly		
7a	early		
7c	rehearse	earnest	earthling
8b	earnestly	rehearsal	

26,5

IE12   Frequency = 54

2b	chief	pier	thief
4a	field	fiend	niece	piece
	shield	siege	yield	
4b	brief	grief	shriek	
5a	priest		
5b	fierce	pierce	
6a	briefcase	cornfield	crosspiece
6b	chiefly	fielder	fiercely
7c	achieve	apiece	belief	believe
	cashier	chieftain	frontier	hygiene
	relief	relieve	wiener	
8a	battlefield	makebelieve	
8b	disbelieve	left-fielder	out-fielder

EI10   Frequency = 15

2b	sheik	seize	
4a	weird		
7a	either(P)		
7c	caffeine	ceiling	conceit	deceit
	deceive	neither(P)	perceive	protein(P)
8b	receive	deceitful	
	receiver		

26,6

EY10   Frequency = 9

2a	hey	they	whey
3b	grey	prey	
6a	greyhound		
7b	obey		
8b	surveyor	disobey	

EI20   Frequency = 19

1	neigh	sleigh	weigh	
2	eight	freight	weight	
3	reign	reins	vein	
4	bobsleigh	eighteen	eighteenth	eighth
	eighty	neighbor	neighborhood	neighboring
	overweight	reindeer		

26,7   Frequency = 125

-ous   Frequency = 39

1	dangerous	humorous	joyous	marvelous
	mountainous	poisonous	prosperous	nervous
2	adventurous	famous	grievous	grievous
	porous			
3	furious	glorious	industrious	injurious
	mysterious	studious	various	victorious
	monstrous	wondrous		
4	courteous	curious	enormous	jealous
5	numerous	obvious	previous	rebellious
	serious	tedious	treacherous	tremendous
6	furiously	jealousy	joyously	previously
	seriously			

OU31   Frequency = 27

2b	touch	young	
6a	touchdown		
6b	touched	touching	
7c	country	couple	cousin
	double	doublet	journal
	journey	nourish	trouble
	youngster		
8a	double-cross	crosscountry	
8b	discourage	troublesome	
9c	courier		
10b	discouragement	encourage	tambourine	tournament

OU35   Frequency = 29

2bi	dough	soul	though
ii	four	pour	
4ai	mould		
4aii	court	fourth	gourd	mourn

Block 27: Frequency = 207

27,1 Frequency = 19

un- Frequency = 8

| 1 | uncivilized | unconnected | unexpected | unlimited |
| 2 | uneventful | unimportant | unmerciful | unsuccessful |

in- Frequency = 6

| | inattention | inattentive | independence |
| | independent | indigestion |

dis- Frequency = 3

| | disappearance | disinfectant | disqualify |

mis- Frequency = 2

| | misunderstand | misunderstood |

27,2 Frequency = 71

Stress pattern 4A   Frequency = 61

1a	Arabia	bacteria	diphtheria(P)	malaria
1b	adverbial	centennial	colonial	congenial
	imperial	industrial	material	memorial
	perennial
1c	appropriate(Aj)		immediate	librarian
2	aquarium	geranium	gymnasium	linoleum
	petroleum
3a	exterior	inferior	interior	superior
3b	ambassador	proprietor	rectangular	triangular
3c	artillery	dispensary	distillery	transparency
4	emergency	necessity	society
	variety
5	coincidence	equivalent	experience	intelligence
	intelligent	obedient
6	impossible	inflammable	invincible	responsible
7	affectionate	aluminum	arithmetic	asparagus
	declarative	diversify	extravagant	identical
	intransitive	Jerusalem	parenthesis	peninsula
	receptacle

Stress pattern 4b   Frequency = 10

1	abbreviate	assassinate	communicate	inaugurate
	incorporate	interrogate	intoxicate	investigate
2	identify	insecticide

5bii	course	source		fourteen
6ai	doughnut			
6aii	courthouse	courtyard	fourscore	
	fourteenth		mourning	
7bi	borough	mournful		
7ci	boulder	thorough		
8bi	thoroughly	moulding	poultry	shoulder
9ci	cantaloupe	throughbred		

OU33 Frequency = 19

2ai	you			
2bi	soup			
2bii	tour	your		
4ai	route(P)	wound(N,V)	youth	
4aii	yours			
4bi	group	through		
5ai	troupe			
6ai	throughout			
6aii	yourself			
7ci	cougar	coupon		
7cii	detour	tourist		
9bi	caribou			
9ci	souvenir			

OU34 Frequency = 11

1b	ought			
2b	bought	fought	nought	sought
	thought			
4b	brought			
6a	forethought			
6b	thoughtful	thoughtless		
8b	thoughtfulness			

26,8 Frequency = 8

UI31 Frequency = 8

4a	build	built		
6b	builder	rebuild	rebuilt	building
7c	biscuit	circuit		

032   Frequency = 13

1a	factory.	hickory	history	ivory
	victory			
1b	Catholic	corporal	favorite	sophomore
2	comfortably(P)	satisfactory	elaborate(Aj)	
3	laboratory			

A32   Frequency = 6

1	boundary	diamond	diaper
2	elementary	frantically	Niagara Falls

I32   Frequency = 3

1	aspirin	cardinal
2	parliament	

27.3   Frequency = 23

Stress pattern 4C   Frequency = 23

1	automatic	economics(P)	prehistoric
	scientific	supersonic	systematic
	antitoxin	Arizona	correspondence
	fundamental	horizontal	influenza
2	interference	interurban	locomotive
	Mississippi	multicolored	

27.4   Frequency = 14

Stress pattern 4D   Frequency = 14

1	customary	ordinary	stationary	temporary
2	alligator	architecture	aviator	cauliflower
	dandelion	dormitory	kindergarten	millimeter
	territory	testimony		

27.5   Frequency = 7

Other four-syllable words   Frequency = 7

accuracy	automobile	charitable	navigable
meteorite	marionette	multiplicand	

27.6   Frequency = 73

E32   Frequency = 51

1a	bakery	bravery	every	grocery(P)
	livery	mystery	nursery	robbery
	scenery	shrubbery	silvery	slavery
	slippery			
1b	conference	difference	different	reverence
	reverent			
1c	evening	fattening	offering	
1d	average	bachelor	beverage	desperate
	interest	jeweler	jewelry	opera
	pickerel	porcelain	several	temperate
	traveler	vaudeville		
2	desparately	differently	everyday	everything
	grocerman(P)	indifferent	interesting	
3	circumference	deliberate(Aj)	delivery	discovery
	embroidery	perfumery	recovery	refinery
	temperature			

Section V

SEQUENCED IRREGULARLY-SPELLED WORDS

Irregularly-spelled words are those words in which there is at least one case of a spelling-to-sound correspondence not included in the present set of correspondences. This section contains a sequenced listing of these words.

The sequence of irregularly-spelled words follows the rule sequence of Section II (summarized in Appendix C) and indicates the first point at which introduction of these words is recommended. (Rules for which there are no corresponding irregularly-spelled words are not listed.) For the most part the words in this section are sequenced with the correspondence rules to which they are exceptions or to which they are similar. In no case, however, are irregularly-spelled words introduced until all their component regular correspondences have been introduced.[1]

In this section, words are grouped within each rule according to their irregular correspondence or, in a few cases, by category (e.g., numbers). The irregular correspondences are indicated by the standard notation (Berdiansky et al., 1969), i.e., spelling to the left of the arrow, pronunciation to the right, environment noted where needed; e.g., o → [u]. The irregular grapheme units are underlined; e.g., do, to.

Recommended Order of Instruction for
Irregularly-Spelled Words in First Year: Frequency = 38

Block 1

1,1

A15   a → [e]: a

I15   i → [ay]: I

1,3

S10   s → [z]: as   is

1,5

B10   a → [e]: bass (in music)

1,6

H10   i → [ay]: hi   his
       s → [z]: has

O15   o → [o]: do
       o → [u]: to

Block 2

2,1

TH13   e → [e]: the

Block 3

3,1

EE10   ee → [i],[ε]: been

3,2

Y19   ye → [ay] / #: bye   bye-bye   dye
                       lye   rye

       eye → [ay]: eye

---

[1]In the development of a reading program it may be necessary to introduce some irregularly-spelled words at an earlier point, to allow naturalness and interest in written material.

Recommended Order of Instruction for Irregularly-Spelled Words in Second Year: Frequency = 111

Block 5

5,1   Compounds

$i \rightarrow I$ / ___nd#: windmill
$o \rightarrow [u]$: into   onto

Block 6

6,1

All   are $\rightarrow [ar]$: are
Ill   cardinal numbers:

irregular: one [wen]
two [tu]

regular by Fourth Year rules: four   seven   eight

(regular by present rules: three   five   six
nine   ten)

Block 7

E11 $e \rightarrow [e]$: crepe
ere $\rightarrow [\text{ər}]$: were

6,2

C11 $o \rightarrow [we]$: once

7,1

Block 8

8,2

A16 $a \rightarrow [a]$: grandma(P)   grandpa(P)
(also $n \rightarrow [m]$, $d \rightarrow \emptyset$, $a \rightarrow [e]$)

4,1

F10 $a \rightarrow [a]$: aha   ha   fa   haha
la   mama   ma   mamma (P)
pa   papa (P)
(in mamma and papa, one of the a's
may be pronounced [ə], Rule A17)

$aa \rightarrow [a]$: baa

musical terms:

irregular: $e \rightarrow [e]$: re
$o \rightarrow [o]$ / l: sol
$a \rightarrow [a]$: fa   la
do   mi   ti

regular by Third-Year and Fourth-Year rules:

W10 $a \rightarrow [e]$, $s \rightarrow [z]$: was
$a \rightarrow [\text{æ}]$/w: swam
$i \rightarrow [I]$/ ___nd#: wind (N)
$o \rightarrow [u]$: wolf   wind   wolf

Block 9

9,2

| E21 | th → [θ] / __ er: ether   panther |
| I21 | t → [tl]: T-shirt |

Block 10

10,1

E17	o → [o]: swollen
	o → [ı]: women
A17	o → [u]: woman
	e → [e]: mesa
O17	ordinal numbers:

    irregular: e → [ε] / __ CV: second
              i → [ay]: ninth

    regular by Fourth Year rules: fourth   seventh   eighth
    (regular by present rules: first   third
                        fifth   sixth   tenth)

10,2

Y17	i → [ı] / __ nd: windy
	a → [ε]: any many
	th → [ð]: worthy
	u → [ε]: bury
	e → [ı]: pretty
LE22	c → [s] / __ C: muscle

10,4

| U11 | s → [ʒ]: insure   sure   surely |
| A25 | toward → [tord] |

10,5

| A17 | a → [a]: garage (P)   (also g → [ʒ]) |
| U17 | o → [u]: undo   unto |

Block 11

11,1

NG10	ng → [ŋ]: gingham (also h → ∅) length
	strength strengthen
	e → [i]: England(P) English(P)

11,2

| CH10 | a → [a], ch → ∅: yacht |

11,3

WH10	wh → [h]: whole wholesale
	also o → [u]: who
	ere → [εr]: ere there whom
	where therefore
	a → [e]: what

11,5

| GG10 | gg → [gJ] (Rules G12, G11): suggest |

Block 12

12,1

AY10	wednes → [wεnz]: Wednesday
	x → [εks]: X-ray
	aye → [e]. [ay]: aye(P)

12,2

	ea → [e]: beefsteak break breaker
	great greatly steak
	ea → [a] / __ r: heart hearty

12,3

| 0011 | u → [u]: cuckoo |

0012	oo → [e]: blood blooded bloody
	flood
	oo → [o] / __ r: door doorstep doorway
	floor indoor
	ye → [ay] / __ #: goodbye

124

Recommended Order of Instruction for
Irregularly-Spelled Words in Third Year: Frequency = 634

Block 13

13,1

031   o → [u] / __ v: improve   move
                        prove

       f → [v]: of
       wh → [h]: wholesome
       one → [wən]: someone
       a → [e]: somewhat
       ere → [εr]: somewhere

13,2   U31   s → [ʃ]: sugar

       A23   a → [æ] / __ ll#: shall
              z → [s]: waltz

       023   o → [o], [a]: begone   gone
              golf

13,3   024   o → [o] / __ st: almost (also all → al [ɔl])
                                host   most
                                post   postal   mostly
                                postman   poster
              o → [o] / __ l: control   holster   patrol
              o → [o] / __ ss: gross
              o → [o] / __ th: both

Block 14

       s → [z]: cleanse   cleanser   clumsy
                 cosmos   husband   muslin
                 pansy   plasma   Thursday
                 wisdom
       a → [ɔ] / __ l: false

Block 15

15,2

eye → [ay]: eyeball   eyebrow   eyelash   eyelid
             pinkeye

ea → [e]: breakdown   daybreak   greatness   yea

ea → [a] / __ r: hearth

o → [o] / __ st: hostess   lamppost   postage   postcard
                  postpone postscript topmost   utmost

o → [u] / __ v: approve   movement

oo → [o]: doorbell   doorman

oo → [e]: bloodshed

s → [z]: absorb   dismal   observe

n → [n] / __ {[g],[k]}: engage incline include inquire

ng → [ŋ] / __ : lengthwise

v → [v] / __ Ce#: allege   comrade   vineyard

e → [e]: fete

ere → [εr]: elsewhere

i → [ɪ] / __ nd: windpipe

i → [ay]: pint

a → [ɔ] / __ l: falsehood

a → [æ] / __ Ce#: forbade

ie → g [J]: judgment

rh → [r]: rhinestone

whole + ly → wholly (wh → [h]; o [o])

one → [wən]: oneself

catsup → [kéčəp]

queue → [kyu]

126

Block 16

16,1

AI10 ai → [ε]: again against said
      ai → [æ]: plaid
      ai → [ay]: Kaiak

16,2

OU10 oo → [o]: outdoor
      oo → [e]: bloodhound

16,3

OE10 oe → [u]: canoe horseshoe shoe shoehorn
                 shoelace shoestring snowshoe
OA10 oa → [ɔ]: abroad broad broadcast
                 broadcloth broadway

16,4

AW10 er → [r]: drawer
AU10 au → [æ]: aunt(P) aunty(P)
      s → [z]: Santa Claus

16,6

UE10 ue → u [u]: truth truthful
      ue → ø; ng → [ŋ]: tongue Tuesday
      s → [z]:
EW10 ew → [o]: sew sewer neutral
      eu → [(y)u]: Europe grandeur

Block 17

17,1

a → [ε]: anyhow anytime anymore anyone anything
o → [u]: saleswoman anyway anywhere (also ere → [ε])
o → [o] / st: postmaster womanhood postmistress
o → [o] / l#: patrolman rock-a-bye self-control
ye → [ay]:
oo → [e]: bloodthirsty
all → al [ɔl]: already
e → [ɪ]: Englishman

17,2

eye → [ay]: blue-eyed cross-eyed eyeglasses
ye → [ay]: dyewoods
oo → [o]: outdoors out-of-doors (also f → [v])
all → al [ɔl]: always

irregular third person singular forms: does, goes

17,3

o → [u]: doings
o → [u]: wolves
ee → [ɪ]: breeches
s → [z]: measles
towards → [tordz]

-er   oe → [u]: shoemaker
-ed   ea → [a] / r: downhearted kindhearted
-ly   ue → u [u]: truthfully
       ea → [a]: heartily

Block 18

18,1

E13 e → [ε] / _CV:

decade deluge herald heron
legend lemon lemonade medal
melon menace metal pedal
peril petal preface rebel (N)
record(N) refuge second secondhand
senate sheriff tenant very

e → [ɪ] / _ch V:
n → [ny]: señor
o → [u]: recharge (P) (also e → [e]: señor)
          remove

O13 o → [a] / _CV

anybody (also a → [ε]) bodily body
comet copy model modern
modest nobody olive process
produce(N) product project(N) proper
properly robin somebody volume

oe → [u]: overshoe

A13 a → [æ] / _CV:

agate	atom	baboon(P)	balance
cabin	cafe (also e → [el] / _#)	dragon	camel
chapel	damage	Latin	fragile
famine	granite	manager	madam
malice	manage	planet	palace
panel	patent	shadow	salad
satin	Saturn	talent	snapdragon
strata	taboo	wagonload	talented
trapeze(P)	wagon		

vacuum (also uu → [yu]) valor, value
a → [a]: amen, drama, llama, plaza

I13 i → [ɪ] / _CV:

city	figure	image	lily
linen	liquid	lizard	minute(N)
minuteman	primer	pity	sinew
spigot	spinach	tribute	vigor
widow	wizard		
iron → [ayərn]	iron	t lat iron	

U13 u → [ə] / _CV: suburb
rh → [r]: rhubarb

18,2

S20 s → [s] / V_V:

abuse (N)	aside	basin	basis
bison	close (Aj)	closely	crusade
crusader	dose	excuse (N)	geese
mason	nuisance	promise (also o → [a] / _CV)	use(N)
purpose	sausage	usage	
useful	useless	vise	tortoise
also:	oi → [e]:	porpoise	

S21 s → [z] / ea_e:

	disease	displease	ease
s → [z] / ou_e:	please	tease	rouse
s → [z] / oo_e:	arouse	house (Vb)	
a → [æ] / _CV:	choose		
	papoose		

18,3

A22 y + age → iage [ɪǰ]: carriage, marriage

18,4

O25 all → al [ɔl]: also
ere → [ɛr]: nowhere
u → [(y)u] / _#   menu (also e → [ɛ] / _CV)
éflu

Block 19

19,1

−ment   a → [æ] / _CV: management
ue → u [yu]: argument
o → [ʊ] / _v: improvement
−ive   s → [s] / V_v: abusive
−ness   ue → u [u]: truthfulness

19,2

124 + GH10

all → al [ɔl]: alright
eye → [ay]: eyesight
o → [a] / _CV   copyright

GH10

H20   gh → [g] / _#: ghost, ghostly
gh → [f]; au → [æ]: ghostly, draught, laugh, laughter, laughingly

ah → [a] / _#: ah, rah, bah, hurrah
rah   rajah (also a → [a]), yah
eh → [ɛ]: eh
oh → [o]: oh
o → [a] / _CV: homage, honest, honor, honestly

p: p → ∅ / _b; oa → [e]: clapboard cupboard
p → ∅ /# _C(C ≠ r, 1); a → [a] / _lm: psalm
corps → [kor]

19,3

K20 oo → [o]: doorknob
     ow → [a]: knowledge

G20 i → [e] / _gn#: ensign
     o → [o]: cologne   champagne
     ch → [š], a → [e], [gn] → n: cologne

19,4

W20 w → ∅: answer   sword

B20 b → ∅ / _t#: debt   doubt   doubtful   doubtless
     i → [ay]: climb
     o → [o]: comb
     o → [u]: tomb

19,5

L20 ould → [ud]: could   would
     a → [a] / _lm: almond   calm   palm
     l → ∅: Lincoln   solder
     colonel → [kərne]

T20 t → ∅: chestnut   mortgage
     oi → [o]: depot
     et → [e]: ballet   buffet   valet (also a → [æ] / _CV)

19,6

U20 i → [ı] / _CV: guinea   guitar
     u → ∅: disguise
     u → [w] /..g_: jaguar (also a → [æ]/ _CV)   language
                    penguin
     u → [w]: persuade
     uy → [ay]: buy   buyer   guy
     ue → ∅ /g_#: league   plague   rogue
     que → [k] /_#: mosque   plaque (also a → [æ] / _CV)
     qu → [k]: conquer   croquet (also et → [e] / _#)
               turquoise,

     also 'V → [V] /_CV:

Other silent letters

d: d → ∅ /#a_]: adjoin   adjust   adjustment
    d → ∅: handsome
n: n → ∅/m_#: autumn   column   condemn   damn
    also o → [a] /_CV: solemn   solemnly

Block 20

20,1

-y   v → [V] /_CV: honesty   sinewy
      s → [š]: sugary
-ful i → [ı] /_CV: pitiful
-al   o → [u] /_v: approval   removal
      u → [ɛ]: burial (y → i [i])
-able o → [u] /_v: movable (optional ∅)

20,2

PH10 v → [V] /_phV: cipher   gopher   siphon
      pph → [f]: trophy
                 sapphire

CH31 ache → [ek]: ache   backache   earache
                   headache   toothache   stomachache
      v → [V] /_CV: chemist   monarch   monarchy
      n → [ŋ]/_: anchor   scholar
      i → [ay]: Christ
      t → ∅: Christmas
      choir → [kwayr]
      ch → [š]: chamois (also a → [æ]/ _CV; ois → [i]) chef
                chauffeur (also au → [o]; eu [ə]). chef
                chute   mustache
      also et → [e]: chalet (also a → [æ] / _CV)
                     crochet (also o → [o]/_chV) sachet

20,3

TH12 v → [V]/_ the#: bathe   clothe
      a → [a]: father   forefather   grandfather   stepfather
      th → [ð]: clothing (also o → [o]/_thV) fathom   heathen
                smooth   smoothly   swarthy
      clothes → [kloz]: clothes   clothesbasket   clothesline
                        clothespin   underclothes
      th → ∅: isthmus

Block 21

21.1
dis- o → [a] / _CV: dishonest   dishonor
re- o → [a] / _CV: remodel

21.2
-tion i → [r] / _tion: addition   ambition   condition
                         edition   partition   position
       a → [æ] / _tional: national rational

21.3
-sion i → [r] / _CV: vision   precision

21.4
-ture a → [æ] / _CV: stature   natural

Block 22

22.1

Stress pattern 3B

v → [v̌] / _CV

anecdote	aqueduct	bobolink	calico
celebrate	criticize	crocodile	decorate
dedicate	democrat	demonstrate	dividend
dominate	domino	dramatize	elevate
generate	gratitude	hemisphere	hesitate
holiday	imitate	kerosene	latitude
manicure	manuscript	memorize	moderate (Vb)
modify	monogram	nominate	operate
pacify	penetrate	populate	ratify
recognize	regulate	ridicule	satisfy
Saturday	separate(Vb)	sterilize	stratosphere
telegram	telegraph	telephone	telescope
tomahawk	trapezoid	vagabond	valentine
	paradise	parasite	parasol
	parachute		
	nightingale		

s → [s] /V_V:
ch → [v̌]/[s]:
n → [n]/_[g]: alcohol
o → [o]/_[ɔ]: almanac
a → [ɔ]/_[ɔ]:
a → [æ]/_CV: ue → ∅ /g_#: catalogue
ae → [ɛ]: aeroplane
au → [aw]: sauerkraut
reservoir → [rɛzəv(w)ar] (P)

22.2

Stress pattern 3A

v → [v̌] / _CV

abacus (P,AS)	animal	banister	benefit
cabinet	calendar	Canada	canopy
capital	capitol	chemical	chemistry
cholera	citizen	colonist	colony
comedy	criminal	decimal	decimal
delicate	diligent	document	definite
elegant	element	elephant	ebony
energy	feminine	ganary	enemy
halibut	hominy	Italy	gravity
liberty	liniment	majesty	janitor
medicine	melody	mineral	medical
miracle	misery	moderate(Aj)	minister
monument	negative	pelican	monitor
policy	popular	positive	platinum
president	primitive	probable	predicate
prominent	property	regiment	probably
regular	relative	remedy	register
resident	senator	similar	residence
specimen	tapestry	tenement	skeleton
vinegar	visible	vocative	vanity
		recipe	

e → [ε] / _CV; e → [i] / _#:
re → [ər]:
a → [ε]: massacre
s → [s]/V_V:
s → [z]; p → ∅ /∅_b: fuselage (P)   marshmallow   raspberry

pleurisy (also eu → [u])

22.3

Stress pattern 3C

v → [v̌] / _CV:

abacus (P, AS)	alpaca	banana	composite
consider		contribute	develop
distribute	enamel	exquisite	imagine
imprison	improper	pajamas	sombrero
soprano			

e → [i] / _#:
also a → [a]: karate   adobe   coyote (P)
                               serape   tamale
                               acknowledge
ow → ∅:   adjacent
d → ∅ /#a_j: almighty
all → al [ɔl]:

c → ∅: antarctic
u → [w] /…g̱: acquaintance distinguish
o → [o]; g → ∅; a → [i]: bologna
teu → [u]; e → [ɛ] /°CV: lieutenant

22.4

Stress pattern 3D

v → [v̆] / _CV:

cigarette, matinee (also ee → [e]) recollect
recommend referee refugee volunteer
qu → [k]: masquerade
que → [k] / _#: picturesque
s → ∅: Illinois (P)

Recommended Order of Instruction for
Irregularly-Spelled Words in Fourth Year: Frequency = 393

Block 23

23.1

A29 a → [e] / _CC: chamber

A24 ea → [e]: breakwater

23.2

I35 v → [v̆] / _CV: chili gasoline khaki (also kh → [k])
magazine vasoline
s → [ʃ] /V _V: valise
ue → ∅ /g _#: fatigue
que → [k] / _#: antique unique
qu → [k]: mesquite mosquito
u → [w]: suite
ch → [s]: machine
gh → [g]: spaghetti
zz → [ts]: pizza
ll → [y]: tortilla
i → [h], e → [e]: frijoles
ai → [ay]: Hawaii

I25 h → ∅: dahlia (or a → [e]; h → ∅: dahlia)
shion → [šən]: cushion fashion old-fashioned
p → ∅ /# G̱ (C ≠ r, l); eu_c → [u]: pneumonia
v → [v̆] / _CV: companion dominion familiar
opinion spaniel Virginia

23.3

Y11 rh → [r]: rhyme
a → [æ] / _CV: analyze

Y13 y → [r] / _CV: chrysalis cylinder hypocrite
myriad physical pyramid
sycamore synagogue
(also o → [a], [ɔ]/ _CV;
ue → ∅ /g _#)
synonym syrup (P) scythe
y → [ay] / _ {ph} V: hyphen typical tyranny
            {th}   typhoid typhoon
y → [e] in unstressed syllables: amethyst oxygen
v → [v̆]/ _CV: xylophone platypus
x → [z] /# _:

Block 25

25,1

-tion V → [V̌] / _CV: benediction   celebration   decoration
                        dedication   demonstration elevation
                        generation   hesitation   imitation
                        legislation   operation   population
                        regulation   resurrection salutation
                        sanitation   satisfaction separation
                        valuation   vegetation
                        exhibition
i → [ɪ] / _tion: recognition (also e → [ɛ] / _CV)   expedition

minuet

25,2

I26 ue → ∅ /g _#:   dialogue
U26 v → [V̌] / _CV: genuine   manual
     oy → [i]:   buoy (or buoy → [boyl])
E26 v → [V̌] / _CV: linear   stereo
026 e → [ɛ] / _CV: heroine

25,3

I36 v → [V̌] / _CV: idiot   patio
                                pianist (P)
     o → [o] / _thV; th → [ð]: aerial   clothier
     ae → [ɛ]:

25,4

A12, 012   re → [ər] /C _#:   acre   ogre
Y12 y → [ɪ] / _Cle#:   bicycle   tricycle
T12 i → [ɪ,] / _Cle#:   triple

25,5

E14 e → [ɛ] / _C[ɪ]V: leprechaun   petrify
                                pueblo (also u → [w])   recreation
                                represent
I14 s → ∅:   isle   island

YL5 y → [e] / _r: martyr   myrrh (also rh → [r])
     n → ∅ /m _#: hymn
     rh → [r], m → [əm] /C _#: rhythm

Block 24

24,1

four-syllable compounds

v → [V̌]/ _CV: citizenship   supervision   vice-president
              watermelon
o → [u] / _v: self-improvement
o → [o] / _thV: underclothing
a → [æ] / _nge: Los Angeles (P)

four-syllable words with suffixes

-er a → [æ] / _CV: atomizer
     o → [u]: evildoer
-or v → [V̌] / _CV: elevator   generator   operator
                    regulator   separator   speculator
-ly v → [V̌] / _CV: definitely moderately regularly
     b → ∅ / _t#: undoubtedly

24,3

E38 a → [ə]: whatever
     ere → [ɛr]: wherever
     who → [hu]: whoever
U28 u → [ə] / _C ish: punish   punishment

24,4

General primary vowel Rule 27

u → [yu] / _C ity (Rule U13): community   security
o → [o] / _C ity (Rule 021): authority (also au → [ɔ]) majority
a → [a] (Rule A24): equality

O14   o → [a] / __C[ʳ]V: proclamation   progress

U14   u → [ə] / __ClV: public   publication   publish
  publisher   quintuplet,   republic

A14   a → [æ] / __C[ʳ]V: acrobat   acrobatic   Africa
  apricot⁶(P)   declaration   establish
  sacrifice

Block 26

26,1

-able   v → [ṽ] / __CV: honorable   manageable   miserable
  preferable

shion → [šən]:   fashionable   establishment

-ment   v → [ṽ]/__C(1)V: development

-al   v → [ṽ]/__CV: additional   mechanical

-ist   o → [a]/__CV: pathologist

26,2

IE17   a → [æ] / __CV: calorie
  au → [æ].: auntie (P)
  o → [u] / __v: movie

EY17   s → [z]: jersey
  o → [ə] / __r: attorney

26,3

AI17   ea → [e]; i → [ɪ] / __CV: Great Britain

26,4

EA33   s → [s] /V__V: research
  ea → [ə] in unstressed syllables:
  pageant (also a → [æ] / __CV),
  sergeant (also e → [a])
  vengeance

26,5

IE12   ie → [r]: handkerchief (also d → ∅) (P) kerchief
  mischief   sieve
  s → [z]: rabies   series

---

ie → [ε]: friend   friendly   friendship
  unfriendly
ie → [ay] fiery
i → [ɪ] / __nd#: windshield
ch → [š] : chandelier

EI10, ei → [e]: heir   heiress   their
  theirs   veil
ei → [r]: counterfeit   forfeit
ei → [ay]: height
ei → [ε]: heifer   heifer
p → ∅ / __t#: receipt
ei → [ə] in unstressed syllables: foreign

26,6

EY10   ey → [-i]: key   keyboard   keyhole
  ey → [ay] s → [z]: geyser

26,7

-ous   v → [ṽ] / __CV: generous   hideous   perilous
  vigorous
ie → [r]: mischievous

OU31   v → [ṽ] / __CV; Plymouth
  s → [s]/V__V: courtesy
  gh → [f]: enough   rough   roughly
  tough
  ch → [š]: moustache

OU35   all → al [ɔl]: although
  s → [s]/v__v: resource
  gu → [k]; et → [e] /__#: bouquet (P)

OU33   ou → [u]: boulevard
  g → [ž]: rouge

OU34   gh → [f]: cough   trough (or gh → [θ])

in-   v → [ṽ] / __CV: incredible   invisible
dis-   a → [æ] / __CV: dissatisfied

Block 27

27,1

27,2

Stress pattern 4A

v → [v̆] / __CV:

academy	affiliate (N)	America
American	amphibian	anonymous
apology	astronomer	astronomy
barometer	certificate	continuous
diagonal	diameter	divisible
economy	experiment	geometry
harmonica	imperative	inadequate
indelible	inquisitive	irregular
magnificent	mahogany	meridan
monopoly	municipal	original
particular	perimeter	philosopher
political	rhinocerous (also rh → [r])	(also rh → [r])
ridiculous	speedometer	
thermometer (P)		

v → [v̆] / __C[ɪ]v: biography democracy geography
republican stenographer
ȳ → [ə]: s a / V__V: chrysanthemum

Stress pattern 4B

v → [v̆] / __CV:

accomodate	affiliate (Vb)	anticipate
apologize	commemorate	consolidate
co-operate	deliberate (Vb)	elaborate (Vb)
evaporate	homogenize	inoculate
participate		

27,3

Stress pattern 4C

v → [v̆ⱼ] / __CV:

anesthetic	apparatus	California
Colorado	Colisseum	epidemic
gladiolus	macaroni	manufacture
mathematics	memorandum	operetta
penicillin	psychedelic (also p → ∅ /# __C;
	semicolon

e → [ē]: señorita (also n → [ɲy]) (P)
ukelele (also e → [i] / __#)
y → [ay] / __chV:
tapioca
all → al [ɔl]: altogether

Stress pattern 4D

27,4

v → [v̆ⱼ] / __c·(ⱼ[ⱼ])v: agriculture caterpillar (also r → ∅)
cemetery ceremony dromedary

February	helicopter (P)	melancholy
legislative	literary	monastery
military	millinery	ragamuffin
necessary	pomegranate	secretary
sanitary	secondary	stationery
seminary	solitary	tributary
tabernacle	television	
carburetor		

e → [e]:

27,5 other four-syllable words

-ism → [ɪzəm] / __#:
communism rheumatism (also th → [r];
eu → [u] also v → [v̆] / __CV: catechism
criticism
v → [v̆] / __CV: capitalize equitable literature
mademoiselle (also oi → [ə]) miniature.

27,6

E32 v → [v̆] / __CV:

adenoid	adenoids	camera
celery	emerald	everybody
federal	general	generally
liberal	reference	vegetable
veteran		
sovereign		
machinery		
everyone		
everywhere		

ei → [ɪ]:
ch → [š]:
one → [wən]:
ere → [ɛr]:

032 v → [v̆] / __CV: brocolli chocolate (P)
licorice (also c → [š]) memory

A32 v → [v̆] / __CV: salary separate (Aj) separately
æ → [æ], r → ∅: sarsaprilla (P)
a → [a]: caramel (P)

I32 a → [æ] / __CV: family

(See also Section VII)

Additional irregularly-spelled words

eau → [o]: beau bureau plateau (also a → [æ]/ __CV:
eau → [yu]: beautiful beautifully (P) beautify
beauty

eo → [ə] in unstressed syllables: dungeon luncheon
    ᴗ pigeon (also i → [ɪ] /___ CV) surgeon

eo → [i]: people
eo → [ɛ]: leopard
eo → [o]: yeoman
et → [e]: ballet
x → [gz] /V___V: buffet exact exáctly
                exam example
unstressed V: exált exert exhaust
            exempt exist existance
            exhibit   examination
    also V → [ṽ]/___CV: examine executive

ae → [i]: sundae
aa → [a]: bazaar
au → ∅: restaurant
monsieur → [məsyér]
aisle → [ayl]

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Section VI

SEQUENCED PROPER NAMES

In Cronnell (1971b) nearly 500 proper names (primarily first names, but some surnames) were listed for use in beginning reading instruction. In this section these names are sequenced according to the rule sequence as found in Section II (summarized in Appendix C). Each name is introduced as an exemplar of a spelling-to-sound correspondence when all other correspondences in the name have been previously introduced. (If a rule has no name exemplars, it is not listed in this section.)

Following the sequenced names, irregularly-spelled names are sequenced, using the same methods as used in Section V for irregularly-spelled words.

Sequenced Proper Names
for First Year: Frequency = 65

Block 1

1,1	N10, NN10, T10, A15						
	Ann	Nan	Nat				
1,2	P10	Pat					
1,3	L10	Al	Lil				
	S10	Stan					
1,4	D10	Dan	Sid				
	E15	Ed	Les	Len	Ned	Ted	Tim
1,5	M10	Mat	Mil	Milt	Pam	Sam	
	B10	Bill	Ben				
	U15	Bud	Dud				
1,6	R10	Rob	Ron				
	H10	Hill					
	O15	Bob	Don	Dot	Tod	Tom	

Block 2

| 2,2 | TH11 | Beth | Smith |

Sequenced Proper Names
for Second Year: Frequency = 159

Block 3

3,1   EE10   Lee

Block 4

4,1   F10   Fran   Fred
      W10   Will
      K10   Ken   Kent
      N20   Hank   Frank

4,2   C12   Cal   Mac   Scot
      CK10   Dick   Mack   Nick   Rick

4,3   G12   Glen   Glenn   Green   Greg   Gwen

4,4   J10   Jack   Jan   Jeff   Jill   Jim   Jon
      X10   Max   Rex

4,5   V10   Bev   Van   Vic

Block 6

6,1   A11   Dale   Dave   Jake   Jane   Kate
      I11   Mike

6,2   O11   Hope
      U11   June
      E11   Eve   Pete   Steve

Block 7

7,1   C11   Bruce   Grace
      G11   Gene

Block 9

9,1   A21   Art   Bart   Carl   Clark   Karl   Mark
      U21   Burt   Curt   Kurt
      I21   Kirk
      E21   Bert   Herb   Sherm

9,2   E21   Albert   Herbert   Miller
      U21   Turner   Wilbur
      A21   Arthur   Parker

Block 10

10,1

I17 Alvin Calvin Dennis Doris Francis Martin
    Marvin Melvin

U17 Edmund

E17 Agnes Alfred Allen Ellen Ernest Ethel
    Frances Kenneth Mildred Warren

A17 Allan Anna Bernard(P) Brenda Cora
    Donna Edgar Edna Ella Emma
    Herman Linda Lora Martha Nora
    Norma Sandra Sherman Stella Thelma

O17 Arnold Burton Clifford Gordon Milton Nelson
    Victor Wilson

10,2

Y17 Abby Andy Becky Betsy Betty Billy
    Bobby Buddy Cathy Cindy Danny Denny
    Gerry Ginny Henry Holly Jerry Jimmy
    Kathy Kenny Lanny Molly Nancy Nicky
    Patsy Patty Penny Polly Randy Sally
    Sammy Sandy Sherry Terry Tommy Vicky
    Wendy

10,4

A21 Arlene Marlene

EE10 Cathleen Doreen Kathleen Noreen

10,5

E17 Jerome

Block 11

11,2

CH10 Chuck Richard

11,3

WH10 White

11,4

GG10 Peggy

11,6

G31 Gertrude Gil Gilbert

Block 12

12,1

AY10 Fay Gay Jay Kay May Ray
    Raymond Taylor

12,2

EA11 Bea Dean Jean Neal

12,5

OW12 Brown Howard

Block 13

13,2

A23 Walt Walter

13,3

O24 Ross

Block 14

Anne Annette Constance Faye Florence Moore
Vance Wayne

Sequenced Proper Names
for Third Year: Frequency = 95

Block 16

16,1

AI10 Claire Craig(P) Faith Gail Lorraine

OE10 Joe

OA10 Joan

I112	Irene				
U13	Hubert	Judith	Judy	Lucy	Rudy

18,2

S20 Joseph(P) Lisa(P) Rose Susan Susanne

18,3

A22	Barry	Carol	Carole	Cary	Clara	Gary
	Harold	Harry	Karen	Larry	Mary	Rosemary
	Sara	Sharon				

16,4

AW10 Lawrence

18,4

025 Jo Margo

AU10 Laura Maureen Maurice Paul Paula Saul

16,5

Block 19

19,2

OY10 Boyd Joy Joyce Lloyd Roy

H20 John Johnny Johnson Sarah

16,6

UE10 Sue

Block 20

20,2

EW10 Andrew Lew Lewis Stewart

PH10	Phil	Phillip	Ralph	Randolph(P)	Rudolph (P)
CH31	Chris				

Block 17

17,2

-s Charles James Jones

Block 22

22,2

Stress pattern 3A

Allison Anderson Anthony Benjamin Christopher
Jacqueline Jennifer Jessica Peterson

Block 18

18,1

E13 Edith Elaine Eva Peter Vera

O13 Lola Roland Tony

22,3

Stress Patern 3C

A13 Ada Amy David Davis Hazel Jacob
Mabel Nathan

Dolores Loretta Melissa Priscilla Rebecca Roberta

Sequenced Proper Names
for Fourth Year: Frequency = 103

Block 23

```
23,1
        A24   Wanda

23,2
        I35   Anita     Bernice   Christine   Josephine (P)
              Lucille   Pauline   Rita        Toni
        I25   Cecilia   Celia     Julia       William      Williams

23,3
        Y11   Clyde
        Y15   Carolyn   Cathryn   Gwendolyn   Kathryn      Lynn
              Marilyn
        Y16   Phyllis
```

Block 24

```
24,2
        E38   Beverly   Evan   Kevin
```

Block 25

```
25,2
        I26   Brian
        U26   Stuart
        E26   Andrea    Beatrice   Leon    Theodore
        O26   Joanna    Joanne     Joel    Lois

25,3
        I36   Cynthia   Gloria     Harriet   Lillian   Marion
              Sylvia    Victoria   Vivian
```

```
25,5
        Al4   Adrienne   April
```

Block 26

```
26,2
       IE17   Annie     Archie    Bernie    Bessie    Bobbie
              Bonnie    Carrie    Cathie    Charlie   Connie
              Eddie     Ellie     Elsie     Ernie     Freddie
              Howie     Jackie    Jeannie   Jennie    Julie
              Katie     Laurie    Leslie    Margie    Nellie
              Robbie    Ronnie    Susie

26,4
       EY17   Audrey    Dudley    Harvey    Jeffrey   Mickey
              Rodney    Shirley   Sidney    Stanley
       EA33   Earl

26,5
       EI10   Keith     Neil      Sheila

26,7
       OU31   Doug      Douglas   Young
       OU33   Lou       Louie     Louis     Louisa    Louise
```

Block 27

```
27,6
        E32   Catherine   Evelyn    Katherine   Margery
        A32   Barbara     Margaret
        O32   Dorothy     Marjorie  Nicholas
```

Sequenced Irregularly-Spelled Proper Names

Recommended Order of Instruction for Irregularly-Spelled
Proper Names in Third Year: Frequency = 37

Block 16

16,6   EW10 eu → [yu]:   Eugene   Eunice

Block 18

18,1   E13   e → [ɛ] / __CV: Eric   Helen

        O13   o → [a] / __CV: Donald   Robert   Roger   Ronald

        A13   a → [æ] / __CV: Adam   Alan   Alex   Alice   Janet   Janice
              a → [a]:   Lana
              a → [e] / __chV: Rachel

        O25   u → [u] / __#   Stu__

18,4

Block 19

19,2   GH10 u → [yu]:   Hugh

19,5   L20   l → ∅:   Malcolm

Block 20

20,2   PH10 e → [i] / __phV; ph → [v]:   Stephen

        CH31 ch → [s]:   Charlene   Charlotte   Michelle

20,3

        TH12 th → [t]:   Esther   Thomas (also o → [a] / __CV)   Thompson
              tth → [ə]:   Matthew

Block 22

22,1   Stress pattern 3B

        v → [ṽ] / __CV: Abigail   Isabel

22,2   Stress pattern 3A

        V → [ṽ] / __CV: Emily   Gregory   Jonathan   Madeline
                           Oliver Pamela   Timothy

22,3   Stress pattern 3C

        th → [t]; s → [s] /V__V: Theresa

Recommended Order of Instruction for Irregularly-Spelled
Proper Names in Fourth Year: Frequency = 28

Block 23

23,2

I35 Eloise → [élɔwlz]
     e → [ɛ] / __CV: Geraldine

I25 v → [v̆] / __CV: Daniel   Virginia

Block 25

25,2

I26 a → [æ] / __CV: Diana   Diane

U26 a → [æ] / __CV: Samuel

25,5

E14 e → [ɛ] / __CrV: Debra

A14 a → [æ] / __CrV: Patrick

Block 26

26,2

IE17 ie → [i] in unstressed syllables: Marie
      a → [æ] / __CV: Natalie   Valerie

26,4

EA33 ea → [e] in unstressed syllables:
      Eleanor (also e → [ɛ] / __CV)   Jeanette

26,5

IE12 ei → [a y]: Eileen

Block 27

27,2

       Stress pattern 4A

       v → [v̆] / __CV: Elizabeth
       Penelope (also e → [i]⌐/ __#)   Nathaniel

27,3

       Stress pattern 4C

       a → [æ] / __CV: Alexander

27,6

E32   e → [ɛ] / __CV: Frederick

032   e → [ɛ] / __CV: Deborah

Miscellaneous

cia → [šə]: Marcia   Patricia (also i → [ɪ] / __CV)
u → [u]: Ruth
i → [a y] / __chV; ae → [e]: Michael
ae → [e]: Rae
eo → [ɛ]: Leonard
ge → [ʤ]: George

Section VII

UNSEQUENCED ADDITIONAL WORDS: FREQUENCY = 253

In addition to the words sequenced in Sections IV to VI there
remain a number of words which were not sequenced. Because of the
variety of these materials, it was decided to present them all in
one section, rather than to attempt to sequence them (as, for example,
a Block 28). Irregularly-spelled words are included, with the irregular
grapheme units underlined (mostly exceptions to general primary vowel
Rule 13).

A. Five- and six-syllable words   Frequency = 112

All of the rules involved in these five- and six-syllable words
have been introduced in Blocks 1-27. The only new features is
increased word length.

1. Five-syllable words   Frequency = 102

a. Five-syllable words with affixes   Frequency = 64

-tion	abbreviation	administration	association (P)
	civilization	communication	confederation
	co-operation	denomination	emancipation
	evaporation	imagination	inauguration
	incorporation	interrogation	intoxication
	investigation	multiplication	organization
	recommendation	representation	

-ly	absolutely	accidentally(P)	affectionately
	approximately	continually(P)	exceptionally(P)
	immediately	industriously	necessarily
	occasionally(P)	originally	particularly(P)

-ity	curiosity	electricity	hospitality
	legibility	opportunity	personality
	popularity	probability	university

-al	agricultural	alphabetical	constitutional
	editorial	experimental	geographical
	international	oratorical	paradoxical
	perodical	transcontinental	

un-	uncomfortable(P)	unnecessary	unreasonable
	unsanitary		

dis-	disagreeable	disobedience	

other:	abolitionist	confectionary	imaginable
	indivisible	manufacturer	revolutionize

b. Other five-syllable words   Frequency = 38

amphitheater	anniversary	appendicitis
archipelago	auditorium	cafeteria
cock-a-doodle-do	delicatessen	denominator
enthusiastic	entymology	evaporated
exclamatory	hippopotamus	hydroelectric
imaginary	inimitable	innumerable
inseparable	intermediate	interrogative
irreproachable	manufactory	metropolitan
miscellaneous	observatory	patriotism
Pennsylvania	preliminary	refrigerator
representative	sanatorium	superintendent(P)
theological	tuberculosis	veterinary
veterinarian	vocabulary	

2. Six-syllable words   Frequency = 10

capitalization	characteristic	encyclopedia
extraordinary(P)	oleomargarine	responsibility
revolutionary	satisfactorily(P)	unconstitutional
unsatisfactory		

B. Palatalizations   Frequency = 141

Palatalizations, although relatively common, are rather complex (see Cronnell, 1971a; pp. 32-34). The three most frequent palatalizations-- tion, sion, ture--are found in Section IV (21,2; 21,3; 21,4; 25,1). The remaining palatalizations are listed below.

1. a. -cial → [šəl]:

artificial	beneficial	commercial	especially(P)
financial	judicial	official	social
special	specialist	specially(P)	specialty

b. -sure → [žər];

exposure	leisure	measure	measurement
pleasure	treasure	treasurer	treasury

c. -ssure → [šər]: assure (or [šur])   pressure

d. -tune → [čun] (or [čən]):

fortunate	fortunately	fortune	fortune-teller
misfortune	unfortunate	unfortunately	

2. a. -sia → [žə]: Asia   Persia
    b. -sian → [žən]: artesian

c. -ssian → [šən]:   Russian

d. -cian → [šən]:   electrician   magician   physician
                         politician

e. -cient → [šənt]:   ancient   efficient   sufficient
                         sufficiently

f. -science → [šəns]:   conscience

g. -ciency → [šənsi]:   efficiency   proficiency

h. -tient → [šənt]:   impatient   impatiently   patient
                         patiently   quotient

i. -tience → [šəns]:   patience

j. -tia → [šə]:   militia

k. -tial → [šəl]:   essential   initial   partial
                         residential

l. -dial → [ǰəl]:   cordial   cordially

3. a. -tious → [šəs]: ambitious   cautious   cautiously
                         nutritious   superstitious

    b. -teous → [čəs]: righteous

    c. -gious → [ǰəs]: contagious   religious

    d. -geous → [ǰəs]: advantageous   courageous   gorgeous
                         outrageous

    e. -cious → [šəs]: delicious   ferocious   gracious
                         precious   spacious   suspicious
                         vicious

    f. -scious → [šəs]: conscious   unconscious

    g. -xious → [kšəs]: anxious   anxiously

4. a. -ci → [ši]:   appreciate   appreciation   associate

    b. -ti → [ši]:   initiate

    c. -su → [žu]:   unusual   unusually   usual
                         usually

d. -tu → [ču]:
actual	actually (P)	congratulate
congratulation	eventually (P)	mature
punctual	punctuality	punctuation
spiritual (P)	statuary	statue

e. -tur(e) → [čər]:
| naturally (P) | saturate | unnatural (P) |

f. -teur → [čər]:
| amateur | pasteurization | pasteurize |
| pasteurizer | | |

g. -du → [ǰu]
(or [ǰə]):
educate	educated	education
educational	gradual	gradually
graduate	graduation	individual
pendulum	schedule	situate
situation		

5. a. -tian → [čən]:   Christian

b. -xion → [kšən]:   complexion   complexioned

c. -cean → [šən]:   Atlantic Ocean   ocean   Pacific Ocean
-ce → [ši]:   oceanic

d. -gion → [ǰən]:   legion   region   religion

e. -dier → [ǰər]:   soldier

f. -cier → [šər]:   glacier

g. -zier → [žər]:   glazier

h. -sier → [žər]:   hosiery

i. -ssue → [šu]:   issue   tissue

j. -sur → [šər]:   insurance

k. -xur → [kšər]:   luxurious   luxury

l. -cies → [šiz]:   species

m. -tio → [šo]:   ratio

Section VIII

SEQUENCED CONTRACTIONS AND ABBREVIATIONS

CONTRACTIONS

The nature and use of contractions. Contraction involves the
shortening of a word[1] by omitting sounds (or in writing, letters),
e.g., will → 'll, not → n't. While most function words are reduced in
speech, only certain spoken contractions are found as written con-
tractions. For example, an' and 'n', while common in speech, are
generally found only in dialect writing and in advertising; should
have is generally pronounced [šúdəv], but is rarely written as the
contraction should've.

Not only are contractions very common in speech, but they are
probably more common than their full forms. It has even been suggested
(Mohr, 1969, p. 8) that "what we call contractions may really be the
underlying forms of the language from which the uncontracted forms are
derived and that many common opinions about and attitudes toward con-
tractions are traceable to orthographic conventions." In any case,
there is no doubt that contractions are natural and usual in speech:
people (adults and children) do not say, "It is Ann;" they say, "It's
Ann."

The use of contractions in beginning reading. The major argument
for using contractions in beginning reading is that they are common in
speech and are probably more familiar to children than the full forms.
The use of contractions permits a closer match between the child's
language and the language of the reading materials, and allows syntax
which is both natural and familiar.

Hansen (1966, p. 13) gives two additional reasons for using
contractions:

1. "They are graphically marked with an apostrophe." Since some
   contractions have irregular spelling-to-sound correspondences
   and must be taught as sight words, the use of the apostrophe
   sets off these contractions as a special set of words for
   which a phonics strategy is inappropriate, thus reducing
   interference between rule words and sight words.

2. "They provide sentence elements to which any noun phrase can
   be easily and naturally attached" (e.g., It's___). In
   addition, some contractions (e.g., let's, I'll) provide

---

[1]Occasionally, contraction involves reduction in a word pair, e.g.,
will not → won't.

"sentence elements" to which any simple verb phrase can be attached. This use of contractions allows syntactically natural sentences within the limits of the vocabulary.

Contractions for SWRL Reading Program. There are 54 contractions listed in Rinsland (1945) and presented in Berdiansky et al. (1969, p. 70).[2] Table 1 lists the contracted forms, four of which ('d, 'll, n't, and 's) account for three-fourths of those found. Several facts should be noted about the phonological realization of the contracted forms:

1. Two-thirds of the n't forms are syllabic, as is one 'll. In all cases these are automatic phonological alternations.

2. Seven of the ten cases of 's are pronounced [z]; this is also an automatic phonological alternation.

3. The forms 're and 've are pronounced [r] and [v], respectively. The [r] pronunciation, as usual, has an effect on the preceding vowel.

Otherwise, contracted forms generally involve the usual spelling-to-sound correspondences; e.g., 'd → [d] (Rule D10), 'll → [1] (Rule LL10). However, the contracted form often occurs earlier in the sequence than the full form and may involve regular spelling-to-sound correspondences as opposed to irregularities in the full form.

The 54 contractions have been arranged according to the rule sequence used in this report. Each contraction is introduced when all its component correspondences have been introduced. Included as regular correspondences are the phonological features outlined above. Sequenced regularly-spelled contractions are listed in Table 2.

Sequenced irregularly-spelled contractions are listed in Table 3. They are arranged according to the sequence of irregularly-spelled words in this report (Section V). When the irregularity is not in the base form it is given beside the contraction.

ABBREVIATIONS

The nature and use of abbreviations. An abbreviation is "a letter or group of letters taken from a word or words and employed to represent it or them for the sake of brevity" (Abbreviation, 1970, p. 13).

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[2]The Berdiansky et al., listing also includes O.K., which actually is neither a contraction nor an abbreviation; it is a separate lexical item which can enter the instructional sequence after the letter names for o and k are taught.

Abbreviations are common in informal writing and in technical writing, where the abbreviations of the particular field are used. In ordinary formal writing, abbreviations are less common, except for certain forms in everyday use.

There is no consistent usage concerning periods at the ends of abbreviations. For the sake of consistency, all abbreviations in this report are followed by periods, with the exception of directions (N, S, E, W), pj's, and Xmas, which conventionally are clearly not followed by periods.

The use of abbreviations in beginning reading. For the most part, there is no need for abbreviations in beginning reading instruction (with exceptions noted below). Full forms are most common and can be used easily and naturally. Since abbreviations violate spelling-to-sound correspondences and must be taught as sight words, they may as well be avoided and the full forms used. At some later stage of reading abbreviations should be taught, probably when they are needed in other subjects (e.g., ft. in arithmetic, abbreviations for states in geography).

There are a few abbreviations which are necessary in beginning reading since they are more common than their full forms:

1. Mr., Mrs., Ms., Dr., when used before proper names. These are the only forms in normal use. There are no written full forms of Mrs. and Ms.

2. a.m., p.m., A.D., B.C., P.S. The full forms of these abbreviations are rarely used.

3. T.V. (or TV). The abbreviation (pronounced as letter names) is very common in speech.

These abbreviations may be needed earlier in reading, especially Mr. and Mrs.

Abbreviations for SWRL Reading Program. As noted above, there is little need for abbreviations in beginning reading. However, a list (from Berdiansky et al., 1969, pp. 66-69, with a few additions) has been prepared of over 200 abbreviations appropriate for the SWRL Reading Program. Some of these abbreviations are those found in Rinsland (1945); the others are commonly used abbreviations for words in the SWRL lexicon (Berdiansky et al., 1969).

Several facts should be noted about the abbreviations in this section:

1. Two or more full forms may have the same abbreviation, e.g., saint, street → st. Some full forms may have two or more abbreviations, e.g., page → p., pg.

2. Most abbreviations are pronounced as their full forms.
   However, a few are pronounced as the letter names of the
   abbreviation, e.g., T.V. → [tjví]. Such abbreviations are
   footnoted accordingly.

3. The full form of several listed abbreviations is not found
   in the SWRL lexicon; these are generally Latin words.

The abbreviations are sequenced according to the position of the
full form in the present sequence. Where the full form of an abbre-
viation is a derived word, the position in sequence is given for the
base, e.g., rec'd ← received, sequenced under receive. Irregularities
are those found in the full form and indicated in Section V. There
are three sequenced lists:

a. Table 4: Sequenced abbreviations of regularly-spelled words
             (cf, Section IV of this report);

b. Table 5: Sequenced abbreviations of irregularly-spelled words
             (cf, Section V of this report);

c. Table 6: Sequenced abbreviations of additional words (cf,
             Section VI of this report).

In addition, Table 7 lists abbreviations whose full forms do not appear
in the SWRL lexicon.

Since all abbreviations, with the exception of those pronounced as
letter names or as abbreviated words, are irregular in terms of spelling-
to-sound correspondences, they may be introduced as sight words, with
the provision that they not be introduced until after all their component
letters have been taught. However, except for those common ones of par-
ticular usefulness, it seems most reasonable to introduce abbreviations
after their full forms are known.

Table 1

Contracted forms

Contracted Form	Number of Occurrences	Full Form	Position of Full Form in Sequence	Position in Sequence of Correspondence for Contracted Form	
'd	6	had/would	1,6 H10/ir* L20 19,5	1,4	D10
'll	7	will/shall	4,1 W10/ir 13,2 A23	1,3	LL10
n't	18	not	1,6 O15	1,1	N10, T10
're	3	are	ir 6,1 A11	6,1	E18
's	10	has/is	ir 1,6 H10/ir 1,3 S10	1,3	S10
't (initial)	2	it	1,1 I15, T10	1,1	T10
've	4	have	24,2 A38	6,1	E18
Miscellaneous					
'm	1	am	1,5 M10	1,5	M10
ma'am	1	madam	ir 18,1 A13	4,1	F10
o'er	1	over	18,1 O13	9,1	E21
's	1	us	1,5 U15	1,3	S10

*ir = in sequence of irregularly-spelled words, Section V of this report.

Table 2

Sequenced Regularly-Spelled Contractions

Position		Contraction		
1,3	LL10	it'll***		
	S10	it's		
1,4	D10	didn't**		
	E15	let's		
1,6	H10	hadn't**		
2,1	TH13	that's		
3,1	EE10	needn't**		
	E25	he'd	he'll	he's*
		she'd	she'll	she's*
		we'd	we'll	
3,2	C12	can't		
6,2	E11	here's*		
	E11 or E18	we're	we've	
12,4	OW12	how's*		
13,2	A23	all's*		
16,1	AI10	ain't		
24,2	A38	haven't**		
26,6	EY10	they'd	they'll	they're
		they've		
26,7	OU33	you'd	you'll	you're
		you've		

*s → [z]
**syllabic n't
***syllabic 'll

Table 3

Sequenced Irregularly-Spelled Contractions

Position		Contraction		Irregularity, if not in base
1,3	LL10	I'll		
	S10	isn't**	'tis	
1,4	D10	I'd		
1,5	M10	I'm		
1,6	H10	hasn't**		
4,1	F10	ma'am		$\underline{a'a} \rightarrow [æ]$
	W10	'twas	wasn't**	
6,1	E18	I've		
	A11	aren't		
6,2	E11	weren't		
9,1	E21	o'er		$\underline{o'e} \rightarrow [o]$
11,3	WH10	what's	where's*	
		who's*		
13,3	O24	don't	won't	$\underline{o} \rightarrow [o]$
17,2	-$\underline{s}$	doesn't**		
19,5	L20	couldn't**	shouldn't**	
		wouldn't**		
	T20	mustn't**		$\underline{t} \rightarrow \emptyset$

*$\underline{s} \rightarrow [z]$
**syllabic $\underline{n't}$

Table 4

Sequenced Abbreviations of Regularly-Spelled Words

Position of Full Form in Sequence	Abbreviations		Position of Full Form in Sequence	Abbreviation	
3,1 EE10	st.	(Street)	E17	obj.	
				prob.	
4,1 F10	ft.	(feet)		subj.	
	l.		017	dr.	(doctor)
W10	W			gal.	
	w., w/				
	T		11,2 CH10	chap.	
4,2 K10	wk.			in.	
				Mar.	
6,1 I11	dr.	(drive)			
	mi.		11,4 QU10	qt.	
				qtr.	
7,1 C11	pl.	(place)		sq.	
G11	p., pg.		12,1 AY10	frwy.	
	pp.			Sun.	
9,1 A21	pk.		12,2 EA11	E	
	pt.	(part)		ea.	
	yd.			P.T.A.*	(teacher)
				S.S.*	
021	ft.	(fort)		yr.	
	N				
	no.	(north)	12,3 0011	n.	(noon)
	pt.	(port)		rm.	
9,2 E21	adv				
	Mr.		0012	ft.	(foot)
021	cor.		13,1 031	doz.	
				mo.	
				Mon.	
10,1 A17	bkwd				
	fwd.		U31	bu.	

*Pronounced as letter names.

Table 4--continued

Position of Full Form in Sequence		Abbreviations		Position of Full Form in Sequence		Abbreviation
13,2	A23	sm.		18,3	A22	P.T.A.* (parent)
14,2	VrCe#	chg. lg.		19,1	-ment	apt. dept. govt.
14,2	Unstressed VCe#	pkg.			-or	dir. gov.
16,1	AI10	chm. pd. pr. rwy. st. (saint)			-ant	prof. asst.
				19,2	124 + GH10	hwy. r., rt.
16,2	OU10	acct. am't. lb. mt. n. (noun) oz. S, so. w/o			H2O	hr.
				20,2	PH10	ph.
					CCH31	sch.
				20,3	TH12	bro.
16,3	OA10	rd. rr.		21,2	-tion	conj. jct. sta.
16,4	AU10	Aug.		21,3	-sion	disc. div.
16,5	OI10	pt. (point)				
16,6	EW10	N.Y.		22,1	Stress pattern 3B	inst. long.
17,1	3-syllable compounds	hdqrs. h.p.		22,2	Stress pattern 3A	adj. co. est. (estimate) Fla. hosp. opp. orch. perm. prin.
18,1	E13	freq. re.				
	O13	pron.				
	I13	Fri. priv. pvt.				
				22,3	Stress pattern 3C	Dec. elec. Nov. Oct. Sept.
	U13	cu. pl. (plural)				

*Pronounced as letter names.

Table 4--continued

Position of Full Form in Sequence	Abbreviations	Position of Full Form in Sequence	Abbreviation
23,1 A24	Wash.	27,3 Stress pattern 4C	Ariz. ec., econ. Miss.
23,2 I25	jr. rev. (review) sr.	27,6 E32	conf. eve. fed. temp.
24,1 4-syllable compounds	U.S.*	032	corp. (corporal) hist.
24,2 E38	Mex. rev. (revenue)	A32	av., avg.
24,3 A38	av., ave.		
25,1 -tion	corp. (corporation) prep. rev. (revolution)		
25,2 I26	q.t.* sci.		
25,4 A12	tbs., tbsp.		
25,5 A14	Apr.		
I14	lib. (library)		
26,3 AI17	Capt. mt. (mountain)		
26,5 EI10	rec'd.		
26,6 E120	wt.		
26,7 -ous	prev.		
OU31	dbl.		
OU33	rt., rte.		
26,8 UI31	bldg.		
27,1 in-	ind.		
27,2 Stress pattern 4C	arith.		

*Pronounced as letter names.

Table 5

Sequenced Abbreviations of Irregularly-Spelled Words

Position of Full Form in Sequence		Abbreviations	Position of Full Form in Sequence		Abbreviation
11,1	NG10	Eng.	22,3	Stress pattern 3C	lieut. pj's*
12,1	AY10	Wed.	22,4	Stress Pattern 3D	Ill. ref.
15,2		pt. (pint)	23,2	I25	Va.
16,6	UE10	Tues.	23,3	Y13	cyl.
18,1	E13	s., sec.	24,1	4-syllable compounds	V.P.*
	O13	vol.			
	A13	mgr. pat.	25,1	-tion	el., elev. pop.
	I13	fig. liq. min.	25,5	E14	rec.
				I14	is.
19,3	W20	ans.		A14	est. (established)
19,6	U20	lang.	26,1	-able	Hon.
20,2	CH31	B.C.* Xmas**	26,2	EY17	atty.
				IE17	cal.
21,2	-tion	nat., nat'l.	26,4	EA33	sgt.
22,1	Stress pattern 3B	cat. chem. (chemistry) Dem. lat. Sat.	26,5	EI10	ht.
			26,7	OU33	blvd.
22,2	Stress pattern 3A	chem. (chemical) med. neg. pres. reg. (regular)	27,2	Stress pattern 4A	Am., Amer. diag. geog. irreg. orig. Rep.

*Pronounced as letter names.
**Pronounced [éksmɪs].

Table 5--continued

Position of Full Form in Sequence		Abbreviations
27,3	Stress pattern 4C	Ca., Cal., Calif. mfg.
27,4	Stress pattern 4D	Feb. Jan. sec'y T.V.*
27,5	Other 4- syllable words	lit.
27,6	E32	gen. lib. (liberal) ref. (reference) vet.** (veteran)
After 27,6 Additional irregularly- spelled words		ex. exec.

*Pronounced as letter names.
**Pronounced [vɛt] and thus in regular sequence at 4,5 V10.

Table 6

Sequenced Abbreviations of Additional Words (i.e., words
in Section VI of this report)

Position of Full Form in Section VI	Abbreviation
A1a	int'l. Pa., Penna. Org. P.T.A.* (association) rep. univ.
A1b	supt. vet.** (veterinarian) vocab.
B1	esp. soc. sp., spec.
B4	assoc. ed., educ. grad. nat., nat'l. (natural)
B5	reg. (region)

*Pronounced as letter names.
**Pronounced [vɛt] and thus in regular sequence at 4,5 V10.

Table 7

Abbreviations Whose Full Forms do not
Appear in the SWRL Lexicon

A.D.*	a.m.*
Mrs.	etc.
p.m.*	Ms.
Rev.	P.S.*

*Pronounced as letter names.

APPENDIX A

KEY TO PRONUNCIATION AND SYMBOLS

Key to Pronunciation

Symbol	Key words (corresponding grapheme units underlined)
Vowels	
[i]	scene, neat, see, chief, happy
[ɪ]	bit, hidden, gym, build
[e]	name, day, rail, they, vein, eight
[ɛ]	get, head
[æ]	fat, man
[a]	hot, car, wash
[ɔ]	song, loss, taught, lawn, talk, ball, thought
[o]	bone, go, fork, toe, board, know, soul, though, war
[ʊ]	put, push, book, could
[u]	food, dew, tune, blue, suit, soup
[ə]	but, above, young
[ay]	mine, die, high, cry, type
[aw]	found, owl
[oy]	boy, noise

Symbol	Key words (corresponding graphemes underlines)
Consonants	
[b]	boy, cab, rabbit
[č]	church, chip, hatch
[d]	dead, do, riddle
[f]	fun, fair, off, phone
[g]	go, get, leg, egg
[h]	home, head
[ǰ]	judge, gem, age, giant
[k]	kill, kick, milk, come, cat
[l]	let, little
[m]	man, ham
[n]	no, hand
[ŋ]	sing, single, think
[p]	pull, trip
[r]	red, far
[s]	see, ice, miss
[š]	she, sure, issue, nation, hash
[t]	ten, hit, liked
[θ]	thing, bath
[ð]	them, bathe
[v]	vase, love
[w]	wet, language, quick
[y]	yet, you
[z]	zoo, lazy, please, wives
[ž]	vision, treasure

Stress

          annóy, fáscinate

          fascináte

Key to Symbols

Parts of speech

    Aj = adjective

    N = noun

    Vb = verb

Other symbols

    P = alternate pronunciation (e.g., for either, route)

    AS = alternate stress pattern (e.g., for invalid), generally also
         involving an alternate pronunciation (P)

    é = a final silent e (Rule E18) which is dropped when adding a
         suffix (e.g., hide, hiding)

    V = vowel

    C = consonant

    ∅ = silent letter

Symbols used in stating rules of correspondence are described in
Berdiansky, Cronnell, and Koehler (1969, pp. 14-15). Additionally,
in the present report, the arrow (→) is sometimes used to represent
a orthographic change: e.g., y → i + ly (i.e., y becomes--is changed
to--i when ly is added, e.g., happy, happily).

APPENDIX B

GLOSSARY

AFFIX: a nonfree form added to a word to make a new word, e.g., the un- in unfair, the -s in boys. Affixes include both prefixes and suffixes.

BASE (WORD): a word to which an affix is added forming a new word; e.g., boy is the base of boys.

COMPOUND: a word composed of two (or more) words, e.g., goldfish, houseboat.

COMPLEMENTARY DISTRIBUTION: a situation in which two sounds or two grapheme units do not contrast in the same environment and are thus classed together. E.g., in English the grapheme units oi and oy are in complementary distribution, since the former occurs only initially and medially, while the latter generally occurs only finally.

CONSONANT DIGRAPH: a grapheme unit composed of two or more consonant letters, e.g., th, ck, qu.

CONSONANT CLUSTER: a series of two or more consonant grapheme units, e.g., spr, nch, nk.

DIALECT: the way a language is spoken (or written) by any group of speakers. Dialects may be based on geographical, social, or ethnic differences, but the term does not indicate any value judgment. The dialect used in this report is known as "General American," a somewhat vague term for the type of English most commonly spoken in the United States.

DIGRAPH: a two-letter grapheme unit, e.g., ch, oa. This term is generally applied to consonants, vowel digraphs being called secondary vowels.

DOUBLE CONSONANT: a grapheme unit composed of two occurrences of the same consonant, e.g., dd, ll. Because of English phonotactics, most spelled double consonants are pronounced the same as a single consonant, e.g., d → [d], dd → [d]. Because of environmental constraints on c and g, this does not completely apply to cc and gg; nor does it apply to words containing morpheme boundaries, e.g., dd → [dd] in midday. The term "geminate" is sometimes used when describing double consonants.

ENVIRONMENT: other letters or sounds in a word which affect a spelling-to-sound correspondence. Indicated by a slash (/) and by underlining in the position of the correspondence. E.g., the environment /__r means that the correspondence occurs when the grapheme unit is followed by r.

EXCEPTION: a grapheme unit in a word for which no (listed) spelling-
    to-sound correspondence is applicable. Words containing exceptions
    are also called exceptions. The term "irregular" refers to exceptions.

EXEMPLAR: a word containing a particular spelling-to-cound correspondence.

GRAPHEME UNIT: one or more letters functioning as a unit in deriving
    spelling-to-sound correspondences, e.g., a, t, mm, oy, th, qu.
    Whatever is on the left-hand side of a rule of correspondence is
    a grapheme unit.

GRAPHOTACTICS: restrictions on the combination of letters and grapheme
    units in a particular language; e.g., x is never doubled and q is
    always followed by u in English. Some graphotactic restrictions
    are the result of phonotactic restrictions; e.g., no English word
    can begin with the letters ft. Cf, PHONOTACTICS.

IRREGULAR: see EXCEPTION.

LONG VOWELS: the sounds [e, i, ay, o, (y)u].

MULTISYLLABLE: a word of two or more syllables.

ORTHOGRAPHY: the spelling system of a language.

PALATALIZATION: the process which accounts for many occurrences of the
    palatal sounds [š, ž, č, j] as in nation, vision, nature, gradual.
    While this is basically a phonological process, it is also used to
    describe certain spelling-to-sound correspondences.

PHONOLOGY: the sound system of a language.

PHONOTACTICS: restrictions on the combination of sounds in a particular
    language; e.g., no word in English can begin with the sounds [ft].
    Cf, GRAPHOTACTICS.

POLYSYLLABLE: a word of three or more syllables.

PRIMARY VOWEL: a grapheme unit composed of a single vowel letter, i.e.,
    a, e, i, o, u, y.

PSEUDO-AFFIX: commonly recurring word parts which look like suffixes
    and prefixes, but which do not act as such grammatically and
    semantically, e.g., the com [kəm] in commit, communion, and
    communicate. In general, pseudo-affixes were historically affixes
    (e.g., Latin com- < cum 'with'), but they have lost their indepen-
    dent status. In some cases, true affixes and pseudo-affixes share
    the same form, e.g., rename/repair, re-form ('form again')/reform.

RULES OF CORRESPONDENCE: see SPELLING-TO-SOUND CORRESPONDENCE.

SECONDARY VOWEL: a grapheme unit composed of two (or more) vowel letters, e.g., ee, oa, ay. Also called "vowel digraph."

SHORT VOWELS: the sounds [æ, ɛ, ɪ, a, ə].

SILENT LETTER: a letter in a word for which there is no corresponding sound in the pronunciation of the word (symbolized by ∅). Some silent letters mark the pronunciation of other letters, e.g., the e in name; some are graphotactic devices, e.g., the e in have; some are anachronisms or scribal inventions, e.g., the gh in bough, the b in debt.

SPELLING-TO-SOUND CORRESPONDENCE: the relationship between the spelling and pronunciation of a grapheme unit. Also called spelling-to-sound correspondence rules and rules of correspondence (rules, for short).

STRESS: the degree of prominence found on a syllable. The basic distinction in spelling-to-sound correspondences is between stressed (marked ' over a vowel) and unstressed (unmarked) syllables. In polysyllabic words it is useful to recognize two levels of stress: primary (') and secondary (`), e.g., accòmmodàte. Stress is sometimes called "accent."

SYLLABLE: a segment of speech containing one vowel sound and optional consonant sounds. (In addition, certain consonant sounds may be syllabic).

SYLLABLE DIVISION: the division between two syllables. Phonologically this is a disputed and unclear matter in English. Orthographically syllable division is regulated by dictionaries and printer's manuals. In this report, syllable division is indicated only in clear-cut cases when necessary for interpretation of spelling-to-sound correspondences.

VOICE: vibration of the vocal chords during speech. All vowels are voiced (i.e., have voice), as are the following consonants: [b, d, g, v, ð, z, ž, ǰ, m, n, ŋ, r, l, w, y]. The voiceless consonants [p, t, k, f, θ, s, š, č, h] are produced without vibration of the vocal chords. The voiced/voiceless distinction is of particular importance in the pronunciation of the -s and -ed suffixes.

APPENDIX C

SUMMARY OF RULE SEQUENCE[1]

First Year

(One-syllable words; Single consonants; Double consonants; Consonant digraphs; Short vowels)

Block 1 (Highest frequency single consonants; Double consonants; General primary vowel Rule 15; short vowels).

    1,1   N10, NN10, T10, (TT10)[2], A15, I15
    1,2   P10, (PP10)
    1,3   L10, LL10, S10, SS10
    1,4   D10, DD10, E15
    1,5   M10, (MM10), B10 (BB10), U15
    1,6   R10, (RR10), H10, O15

Block 2 (Consonant digraphs)

    2,1   SH10
    2,2   TH13, TH11

Block 3 (EE10; Long vowel at end of word)

    3,1   EE10, E25
    3,2   Y19

Block 4 (Less frequent consonants)

    4,1   F10, FF10, W10
    4,2   K10, N20, C12, CK10
    4,3   G12
    4,4   J10, X10, Y10
    4,5   V10, Z10, ZZ10

---

[1] See Appendix D for the pronunciation, rule description, and example of each rule.

[2] Block 1 double consonant rules in parentheses have no exemplars at the point where they are listed in the sequence. Nevertheless, they are included--with their corresponding single consonant rules--because both rules have the same pronunciation. In Appendix D, it is noted where exemplars of the parenthesized rules first appear.

Second Year

(Two-syllable words; Long-vowels; Vowel-r; Other high-frequency vowel
rules; High-frequency consonant digraphs; Unstressed vowels; High-
frequency secondary vowels)

Block 5 (Compounds; Suffixes; NG10)

5,1   Compounds using First-Year rules (first syllable stressed)
5,2   -ing suffix with previously introduced base words
5,3   -es suffix (plurals and third-person singular, present
      tense forms) of previously introduced base words
5,4   -ed suffix (past tense) of previously introduced base words
5,5   NG10 (one-syllable words)

Block 6 (General primary vowel Rule 11)

6,1   E18, A11, I11
6,2   O11, U11, E11, EE10 + E18

Block 7 (C11, G11; Suffixes with general primary vowel Rule 11)

7,1   C11, G11
7,2   -s, -d, and -ing suffixes added to words with general
      primary vowel Rule 11.

Block 8 (Two-syllable words, first syllable stressed)

8,1   Compounds with rules in Blocks 5-7
8,2   A16, I16, U16, E16, O16 (two-syllable words, first syllable
      stressed)

Block 9 (Vowels before r)

9,1   A21, O21, U21, I21, E21 (one-syllable words)
9,2   E21 (plus -er suffix with previously introduced words),
      U21, I21, A21, O21 (two-syllable words, first syllable stressed)
9,3   A25, O22

Block 10 (Unstressed vowels; Two-syllable words, second syllable stressed)

10,1   I17, U17, E17, A17, O17 (first syllable stressed)
10,2   Y17, LE22
10,3   Compounds (second syllable stressed)
10,4   I16, U16, A16, O16, E21, O21, EE10 (two-syllable words,
       second syllable stressed)
10,5   A17, E17, O17, U17, I17 (second syllable stressed)

Block 11 (Consonant digraphs; GG10, CC12, G31)

  11,1 NG10 (two syllables)
  11,2 CH10, TCH10
  11,3 WH10
  11,4 QU10
  11,5 GG10, CC12
  11,6 G31

Block 12 (High-frequency secondary vowels)

  12,1 AY10
  12,2 EA11, EA31
  12,3 OO11, OO12
  12,4 OW11, OW12

Block 13 (Additional common primary vowel rules)

  13,1 O31, U31
  13,2 A23, O23
  13,3 I22, O24

Block 14 (Nonlong vowels in VC(C)e words)

  14,1 Stressed VCCe#
  14,2 Stressed VrCe#
  14,3 Unstressed VCCe# and VCe#

Third Year

(2-3 grade-level words; Three-syllable words; Medium-frequency primary and secondary vowels; Low-frequency consonants; Silent letters; Major palatalizations; Affixes; Stress patterns)

Block 15 (Review, employing 2-3 words covered by First- and Second-Year rules)

15,1   2-3 one-syllable words with First-Year rules
15,2   2-3 words with Second-Year rules

Block 16 (Secondary vowels of medium frequency)

16,1   AI10
16,2   OU10
16,3   OE10, OA10
16,4   AW10, AU10
16,5   OI10, OY10
16,6   UE10, UI10, EW10

Block 17 (Suffixed and compound three-syllable words; Suffixes)

17,1   Three-syllable compounds
17,2   Two-syllable words with suffixes: -er, -en, -ing, -y, -s, -ed
17,3   Three-syllable words with suffixes: -er, -en, -ing, -ed, -ly

Block 18 (Primary-vowel and single-consonant rules of medium frequency)

18,1   E13, O13, A13, I13, U13
18,2   S20, S21
18,3   A22
18,4   O25

Block 19 (Silent letters)

19,1   Three-syllable words with suffixes: -ment, -or, -ive -ness, -ance, -ant
19,2   IE11, I24 + GH10, GH10, H20
19,3   K20, G20, W20
19,4   B20
19,5   L20, T20
19,6   U20

Block 20 (Consonant digraphs; Double Consonants)

   20,1   Three-syllable words with suffixes: -y, -ful, -al,
          -able, -eth, -less, -ist, -ish
   20,2   PH10, CH31
   20,3   TH12
   20,4   CC11

Block 21 (Palatalizations)

   21,1   Three-syllable words with prefixes: un-, re-, dis-,
          in-, mis-
   21,2   -tion
   21,3   -sion
   21,4   -ture

Block 22 (Non-affixed three-syllable words)

   22,1   Stress pattern 3B
   22,2   Stress pattern 3A
   22,3   Stress pattern 3C
   22,4   Stress pattern 3C

Fourth Year

(Low-frequency primary and secondary vowels; Four-syllable words;
Affixes; Four-syllable stress patterns)

Block 23 (Specific primary vowel rules)

    23,1   A29, A24
    23,2   I35, I25
    23,3   Y11, Y13, Y15, Y16

Block 24 (Four-syllable words; Rules for exceptions to general primary
        vowel Rule 13)

    24,1   Four-syllable compounds
            Four-syllable words with suffixes: -ing, -y, -er, -or,
            -ed, -ly
    24,2   E38, I38, A38, O38
    24,3   A29, I28, Y28, O28, E28
    24,4   General primary vowel Rule 27

Block 25 (Remaining general primary vowel rules)

    25,1   Four-syllable words with -tion
    25,2   I26, Y26, U26, E26, O26, A26
    25,3   I26, Y36
    25,4   A12, I12, Y12, O12, U12
    25,5   E14, I14, Y14, A14, O14, U14

Block 26 (Low-frequency secondary vowel rules)

    26,1   Four-syllable words with suffixes: -able, -ment, -al, -ness
            -ary, -ist
    26,2   IE17, EY17
    26,3   AI17
    26,4   EA33
    26,5   IE12, EI10
    26,6   EY10, EI20
    26,7   -ous, OU31, OU35, OU33, OU34
    26,8   UI31

Block 27 (Four-syllable words; General primary vowel Rule 32)

    27,1   Four-syllable words with prefixes: un-, in-, dis-, mis-
    27,2   Stress pattern 4A and 4B
    27,3   Stress pattern 4C
    27,4   Stress pattern 4D
    27,5   Other four-syllable words (miscellaneous stress patterns)
    27,6   E32, O32, A32, I32

APPENDIX D

SPELLING-TO-SOUND CORRESPONDENCES:
RULE DESCRIPTION, EXAMPLES, POSITION IN SEQUENCE

Spelling-to-Sound Correspondences for Primary Vowels

Grapheme Unit	Rule #[1]	Rule Description	Examples	Position in sequence
A	11	$a \rightarrow [e] / \_\_Ce\#$	name, brave	6,1
	12	$a \rightarrow [e] / \_\_C\{^r_l\}e\#$	acre, stable	25,4
	13	$a \rightarrow [e] / \_\_CV$	baby, nature	18,1
	14	$a \rightarrow [e] / \_\_CrV$	April, fragrant	25,5
	15	$a \rightarrow [æ] / \_\_C(C)\#$	sat, fast	1,1
	16	$a \rightarrow [æ] / \_\_CC....$	saddle, jacket	8,2
	17	$a \rightarrow [ə], [ɪ]$ in unstressed syllables	above, final	10,1
	21	$a \rightarrow [a] / \_\_\{^{rC}_{r\#}\}$	cart, car	9,1
	22	$a \rightarrow [ɛ], [æ] / \_\_r$	vary, marry	18,3
	23	$a \rightarrow [ɔ] / \_\_\begin{Bmatrix} ll \\ lk \\ lt \\ ld \end{Bmatrix}\#$	ball, walk salt, bald	13,2
	24	$a \rightarrow [a], [ɔ] / \{^w_u\}\_\_$	wad, squat	23,1
	25	$a \rightarrow [o] / \begin{Bmatrix} wh \\ w \\ qu \end{Bmatrix}\_\_r$	wharf, war, quart	9,3
	26*[2]	$a \rightarrow [e] / \_\_-V$	mosaic	25,2

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[1]For further description of these rules and of the rule notation, see Berdiansky, Cronnell and Koehler (1969), Cronnell (1971a), and Section II of this report.

[2]Asterisked rules do not appear in earlier reports.

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
A	27*	a → [æ] /__City	humanity, capacity	24,4
	28*	a → [æ] /__C {ic, id, ish, it}	magic, rapid radish, habit	24,3
	29	a → [e] /__{nge, ste#}	strange, paste	23,1
	32	a → ∅	separate	27,6
	38	a → [æ] /__ {vV, x(1)V}	cavern, axis axle	24,2
E	11	e → [i] /__Ce#	scene, here	6,2
	13	e → [i] /__CV	hero, meter	18,1
	14	e → [i] /__C{r, 1}V	zebra, declare	25,5
	15	e → [ε] /__C(C) #	set, felt	1,4
	16	e → [ε] /__CC....	edge, extra	8,2
	17	e → [ə], [ɪ] in unstressed syllables	hidden, talent, magnet	10,1
	18	e → ∅/__#	name, edge, immense, mice	6,1
	19	e → ∅/__{d, s}	armed, wives	--- 3
	21	e → [ə] /__{rC, r#}	herd, father	9,1
	25	e → [i] /#(C)C__#	we, she	3,1
	26	e → [i] /__-V	create, meow	25,2
	27*	e → [ε] /__ City	prosperity	24,4
	28*	e → [ε] /__C {ic, id, ish, it}	relic, cherish credit	24,3

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3 Not taught explicitly as a correspondence rule.

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
E	32	e → ∅	difference, several	27,6
	38	e → [ɛ] / __{$\begin{matrix} vV \\ x(1)v \end{matrix}$}	clever, exit	25,2
I	11	i → [ay] / __Ce#	fine, like	6,1
	12	i → [ay] / __Cle#	title, idle	25,4
	13	i → [ay] / __CV	pilot, cider	18,1
	14	i → [ay] / __C{$\begin{matrix} r \\ 1 \end{matrix}$}V	migrate, idly	25,5
	15	i → [ɪ] / __C(C)#	sit, milk	1,1
	16	i → [ɪ] / __CC....	hidden, little	8,2
	17	i → [ə], [ɪ] in unstressed syllables	missile, office	10,1
	21	i → [ə] / __{$\begin{matrix} rC \\ r\# \end{matrix}$}	bird, sir	9,1
	22	i → [ay] / __{$\begin{matrix} nd \\ ld \\ gn \end{matrix}$}#	find, wild sign	13,3
	24	i → [ay] / __gh	high, right	19,2
	25	i → [y] /C__VC	million, onion	23,2
	26	i → [ay] / __-V	liar, diet	25,2
	27*	i → [ɪ] / __City	humidity, captivity	24,4
	28*	i → [ɪ] / __C{$\begin{matrix} ic \\ id \\ ish \\ it \end{matrix}$}	clinic, timid, finish, limit	24,3
	32	i → ∅	aspirin	27,6
	35*	i → [i]	police, ski	23,2
	36*	i → [i] / __-V	radio, period	25,3
	38	i → [ɪ] / __{$\begin{matrix} vV \\ x(1)v \end{matrix}$}	civic, river	24,2

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
O	11	o → [o] /__Ce#	home, smoke	6,2
	12	o → [o] /__C$\{^r_l\}$e#	ogre, noble	25,4
	13	o → [o] /__CV	notice, odor	18,1
	14	o → [o] /__C$\{^r_l\}$V	okra, only	25,5
	15	o → [a] /__C(C)#	lot, lock	1,6
	16	o → [a] /__CC....	motto, hockey	8,2
	17	o → [ə], [ɪ] in unstressed syllables	cotton, sailor	10,1
	21	o → [o], [ɔ], [a] /__r	horn, tortoise	9,1
	22	o → [ə] /w__rC	word, worth	9,3
	23	o → [o] /__lC#	roll, gold, yolk, bolt	13,2
	24	o → [ɔ], [a] /__ $\left\{\begin{matrix} fC \\ ng \\ ss \\ st \\ th \\ g\# \end{matrix}\right\}$	off, soften, song, moss, lost, moth, dog	13,3
	25	o → [o] /__#	go, motto	18,4
	26	o → [o] /__-V	poem	25,2
	28*	o → [a] /__C $\left\{\begin{matrix} ic \\ id \\ ish \\ it \end{matrix}\right\}$	phonics, solid, abolish, profit	24,3
	31	o → [ə]	won, mother, some, love	13,1
	32	o → ∅	sophomore, licorice	27,6
	38	o → [a] /__$\{^v_x\}$V	novel, oxen	24,2
U	11	u → [(y)u] /__Ce#	use, crude	6,2
	12	u → [(y)u] /__Cle#	bugle	25,4

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
U	13	u → [(y)u] /__CV	unit, crusade	18,1
	14	u → [(y)u] /__C$\{^r_1\}$V	bugler, lubricate	25,5
	15	u → [ə] /__C(C)#	gum, fuss	1,6
	16	u → [ə] /__CC....	sudden, justice	8,2
	17	u → [ə], [ɪ] in unstressed syllables	lettuce, minute	10,1
	20	u → ∅ / #g__V	guest, guard	19,6
	21*	u → [ə] /__r	fur, burn	9,1
	26	u → [(y)u]/__-V	fluid, ruin	25,6
	31	u → [ʊ]	bull, push put	13,1
	32	u → ∅	natural	27,6
Y	11	y → [ay] /__Ce#	rhyme, type	23,3
	12	y → [ay] /__Cle#	cycle	25,4
	13	y → [ay] /__CV	tyrant, papyrus	23,3
	14	y → [ay] /__C$\{^r_1\}$V	hydrant, cyclone	25,5
	15	y → [ɪ] /__C(C)#	myth, gym	23,3
	16	y → [ɪ] /__CC...	system, gypsy	23,3
	17	y → [i], [ɪ] /__# in unstressed syllables	baby, candy	10,2
	19	y → [ay] /__# in stressed syllables	deny, try	3,2
	26*	y → [ay] /__-V	hyena	25,2
	28*	y → [f] /__Cic	physic	24,3
	36*	y → [i] /__-V	Tokyo	25,3

Spelling-to-Sound Correspondences for Secondary Vowels

Grapheme	Rule #	Rule Description	Examples	Position in sequence
AI	10	ai → [e]	stain, rain	16,1
	17	ai → [ə], [ɪ] in unstressed syllables	captain, villain	26,3
AU	10	au → [ɔ]	cause, author	16,4
AW	10	aw → [ɔ]	saw, hawk	16,4
AY	10	ay → [e]	day, play	12,1
EA	11	ea → [i]	each, heat	12,2
	31	ea → [ɛ]	bread, deaf, heaven	12,2
	33	ea → [ə] /__r	earn, search	26,4
EE	10	ee → [i]	beet, feel	3,1
EI	10	ei → [ɪ]	receive, ceiling	26,5
	20	ei → [e] /__ $\begin{Bmatrix} gn \\ n \\ gh \end{Bmatrix}$	reign, rein neighbor	26,6
EW	10	ew → [(y)u]	few, new	16,6
EY	10	ey → [e]	they, obey	26,6
	17	ey → [i] in unstressed syllables	donkey, money	26,2
IE	11	ie → [ay] /__#	die, lie	19,2
	12	ie → [i] /__....	field, grief	26,5
	17	ie → [i] /__# in unstressed syllables	collie, movie	26,2
OA	10	oa → [o]	load, boat	16,3
OE	10	oe → [o] /__#	hoe, toe	16,3

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
OI	10	oi → [ᵒy]	noise, join	16,5
OO	11	oo → [u]	broom, tool	12,3
	12	oo → [ʊ]	book, wood	12,3
OU	10	ou → [aw]	count, mountain	16,2
	31	ou → [ə]	couple, young	26,7
	33	ou → [(y)u]	through, group	26,7
	34	ou → [ɔ]	fought, thought	26,7
	35	ou → [o]	soul, though	26,7
OW	11	ow → [o]	glow, below, own, bow	12,4
	12	ow → [aw]	now, allow, owl, bow	12,4
OY	10	oy → [oy]	boy, toy	16,5
UE	10	ue → [(y)u]	blue, argue	16,6
UI	10	ui → [(y)u]	fruit, juice	16,6
	31	ui → [ɪ]	build, biscuit	26,8

Spelling-to-Sound Correspondences for Consonants

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
B	10	b → [b]	boy, cub, number	1,5
	20	b → Ø /m __ #	climb, comb	19,4
BB	10	bb → [b]	bubble, blubber	1,5 (9,2)[4]
C	11	c → [s] / __ $\left\{\begin{array}{c}e\\i\\y\end{array}\right\}$	cent, lace, city, fancy	7,1
	12	c → [k] / __ $\left\{\begin{array}{c}a\\o\\u\\C\\\#\end{array}\right\}$	cat, come, cut cream, picnic, scare	4,2

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[4] The unit in parentheses after some double consonant rules indicates the first actual occurrence; see Section II.

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
CC	11*	cc → [ks] / __e	accent, succeed	20,4
	12	cc → [k] / __$\left\{\begin{array}{c}a\\o\\u\end{array}\right\}$	yucca, account, accuse	11,5
CH	10	ch → [č]	cheap, church	11,2
	31	ch → [k]	ache, school, chord	20,2
CK	10	ck → [k]	kick, pack	4,2
D	10	d → [d]	dead, needle	1,4
DD	10	dd → [d]	hidden, sudden	1,4
F	10	f → [f]	fat, after	4,1
FF	10	ff → [f]	off, taffy	4,1
G	11	g → [j] / __$\left\{\begin{array}{c}e\\i\\y\end{array}\right\}$	gem, age, gin, gypsy	7,1
	12	g → [g] / __$\left\{\begin{array}{c}a\\o\\u\\C\\\#\end{array}\right\}$	gave, go, gum, green, bag	4,3
	20*	g → ∅ / $\left\{\begin{array}{c}\#\_\_n\\\_\_n\#\end{array}\right\}$	gnaw, sign	19,3
	31	g → [g]	get, girl	11,6
GG	10	gg → [g]	egg, wiggle	11,5
GH	10	gh → ∅	though, taught, high	19,2
H	10	h → [h]	home, ahead	1,6
	20	h → ∅	rajah, hour	19,2
J	10	j → [j]	joy, judge	4,4
K	10	k → [k]	milk, kill	4,1

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
K	20	k → ∅ /#__n	know, knot	19,3
L	10	l → [l]	like, mile	1,3
	20	l → ∅ / {o__k, a__f, a__k, a__m, a__v}	yolk, folk, half, calf, walk, stalk, palm, calm, calves, salve	19,5
LE	22	le → [əl] /C__#	little, stable	10,2
LL	10	ll → [l]	bullet, fill	1,3
M	10	m → [m]	man, came	1,5
MM	10	mm → [m]	summer, mammal	1,5 (9,2)
N	10	n → [n]	no, nine, fun	1,1
	20	n → [ŋ] /__ {k, x, qu, g pronounced [g], c pronounced [k]}	thank, sink; anxious; banquet; single, finger; Lincoln	4,1 (23,3) (11,4) (10,2) (4,5)
NG	10	ng → [ŋ] /__#	ring, song	5,5
NN	10	nn → [n]	inner, funny	1,1
P	10	p → [p]	people, pop	1,2
PH	10	ph → [f]	phone, photo	20,2
PP	10	pp → [p]	pepper, apple	1,2 (9,2)
QU	10	qu → [kw]	quick, banquet	11,4
R	10	r → [r]	run, far	1,6
RR	10	rr → [r]	hurry, marriage	1,6 (9,1)
S	10	s → [s]	sun, fast, horse	1,3
	20	s → [z] /V__V	nose, easy	18,2

Grapheme Unit	Rule #	Rule Description	Examples	Position in sequence
S	21	s → [s̥] / $\begin{Bmatrix} ou \\ oo \\ ea \\ a \end{Bmatrix}$—e	house, moose, lease, case	18,2
	31	s → [z] /__#	trousers, wives, riches	---[5]
SH	10	sh → [š]	shoe, rush	2,1
SS	10	ss → [s]	mess, missle	1,3
T	10	t → [t]	title, let	2,1
	20	t → ∅ / $\begin{Bmatrix} s\_\_le\# \\ s\_\_en\# \\ f\_\_en \end{Bmatrix}$	wrestle, fasten, often	19,5
TCH	10	tch → [č]	match, notch	11,2
TH	11	th → [θ]	thin, bath	2,2
	12	th → [ð] /__$\begin{Bmatrix} e \\ er \\ ern \end{Bmatrix}$ #	bathe, father, northern	20,3
	13	th → [ð] in pronouns, conjunctions, and other function words	they, although, the	2,2
TT	10	tt → [t]	little, mitt	1,1 (1,5)
V	10	v → [v]	vase, love	4,5
W	10	w → [w]	wet, beware	4,1
	20	w → ∅ /#__r	wren, wrong	19,3
WH	10	wh → [hw] or [w]	when, whether	11,3
X	10	x → [ks]	box, oxen	4,4
Y	10	y → [y]	yet, beyond	4,4
Z	10	z → [z]	zoo, lazy	4,5
ZZ	10	zz → [z]	buzz, fuzzy	4,5

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[5]Not explicitly taught as a correspondence rule.

APPENDIX E

NUMBER OF WORDS SEQUENCED FOR READING INSTRUCTION

Year	Basic word list (Section IV)	Irregularly-spelled words (Section V)	Proper names (Section VI)	Irregularly-spelled proper names (Section VI)	Total
1	797	38	65	---	900
2	2313	111	159	---	2583
3	3253	634	95	37	4019
4	1148	393	103	28	1672
Total	7512	1176	422	65	9174

Additional unsequenced material (Section VII)   253

Grand total   9427

Total number of names: 487

Total number of other words: 8940

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